Draft Programmatic Environmental Impact Statement for the Eagle Rule Revision

United States Department of Interior

Fish and Wildlife Service

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SUMMARY

This Programmatic Environmental Impact Statement (PEIS) analyzes the potential impacts to the human environment that may result from implementation of proposed revisions by the United States Fish and Wildlife Service (USFWS or Service) to several eagle permit regulations that authorize take of bald and golden eagles ("eagles") and eagle nests pursuant to the Bald and Golden Eagle Protection Act (Eagle Act; 16 U.S.C. 668-668d).

Purpose and Need

Bald eagle populations continue to expand throughout their United States (U.S.) range. Golden eagles in the coterminous U.S. may be declining toward a lower population size. Unauthorized sources of human-caused mortality are a significant factor affecting population trends and size for golden eagles. The Service's incidental take permit regulations provide an opportunity to bring many activities into compliance with the Eagle Act, and in doing so, secure avoidance, minimization, and compensatory mitigation measures to reduce and offset detrimental impacts to eagles. However, the current incidental-take permit regulations appear to have offered insufficient incentive to bring many project proponents and developers to the table. Consequently, conservation opportunities are lost.

The purpose of this action is to establish updated management objectives and a permitting framework that will ensure preservation of eagles while decreasing the regulatory burden and increasing certainty for those engaged in otherwise lawful activities. The revised permit regulations need to be implementable within a reasonable timeframe and without consuming a disproportionate share of the Service's increasingly limited resources.

To satisfy the purpose and need, the selected alternative should:

- Increase public compliance by simplifying the permitting framework and increasing certainty;
- Allow for consistent and efficient administration of the program by Service staff;
- Be based on best available science and data; and
- Enhance protection of eagles throughout their ranges by increasing implementation of avoidance, minimization, and mitigation of adverse impacts from human activities.

Public Participation

A Notice of Intent (NOI) to Prepare an Environmental Assessment (EA) or EIS pursuant to the National Environmental Policy Act (NEPA) was published in the Federal Register (FR) on June 23, 2014 (79 FR 35564). The NOI also announced the public scoping process and invited the public to participate.

Five public scoping meetings were held in Sacramento, Minneapolis, Albuquerque, Denver, and Washington, DC between July 22, 2014, and August 7, 2014. These meetings consisted of a narrated overview video presentation and ten large informational displays with supplemental informational handouts. Representatives from the Service were available to answer participants' questions and listen to their ideas and concerns. Approximately 213 people attended the meetings, and all were encouraged to submit written comments.

The Service developed a website, http://www.eaglescoping.org, where visitors could go to see the same information that was presented at the public meetings, including the overview video presentation and informational displays. Links to the Service e-mail for public comments were included on the site.

The Service received a total of 536 comments during the public comment period. Upon removal of duplicates, there were a total of 517 unique comments, of which many included additional attachments (e.g., scanned letters, one picture, and supporting documents). In addition to the comments received, two organizations provided spreadsheets with additional comments. First, Friends of Blackwater provided a spreadsheet listing 46 supporters of their comment. Second, the National Audubon Society provided a spreadsheet of 25,349 comments in support of their comment and 2,064 personalized comments.

The Service is providing a 60-day review and comment period beginning with the publication of the Notice of Availability (NOA) of the Draft PEIS in the FR. Comments on the Draft PEIS can be submitted directly through Regulations.gov (with a link from the PEIS website: http://www.eagleruleeis.org). The public can also mail in comments to:

Public Comments processing, Attn: FWS-R9-MB-2011-0094
Division of Policy, Performance, and Management Programs
U.S. Fish and Wildlife Service, MS: BPHC
5275 Leesburg Pike, Falls Church, VA 22041-3803

The Service will consider all comments received during the Draft PEIS review period in preparing the Final PEIS.

A NOA for the Final PEIS will be published in the FR. The Final PEIS will be distributed to all individuals and parties that submitted substantive comments on the Draft PEIS and to other interested parties who request a copy of the PEIS. A Record of Decision (ROD) will be issued no sooner than 30 days following publication of the NOA for the Final PEIS.

Proposed Action and Alternatives

The Service is proposing to modify current management objectives for bald and golden eagles, which were established with the 2009 eagle permit regulations and Final EA of the regulatory permitting system under the Eagle Act. The management objective directs strategic management and monitoring actions and ultimately determines what level of permitted eagle take can be allowed, consistent with the Eagle Act.

The Eagle Act prohibits take of bald eagles and golden eagles except pursuant to federal regulations. The Eagle Act allows the Secretary of the Interior to issue regulations to authorize the "taking" of eagles for various purposes. In 2009, the Service promulgated regulations that established two new permit types for take of eagles and eagle nests. One permit authorizes, under limited circumstances, the take (removal, relocation, or destruction) of eagle nests. The other permit type authorizes nonpurposeful take (disturbance, injury, or killing) of eagles where the take is incidental to an otherwise lawful activity.

The Service's current management objective for both bald and golden eagles is to ensure that authorization of take is consistent with the goal of maintaining the potential for stable or increasing breeding populations over 100 years. The Service considered at least four elements when establishing the management objective: (1) the population objective and relevant timeframe for it to be met; (2) the delineation of eagle management units (EMUs), or the geographic scale over which permitted take is regulated to meet the population objective; (3) whether to also set an upper limit on take at a finer scale than the EMU to avoid extirpation of local breeding populations; and (4) the appropriate level of risk tolerance.

To achieve these management objectives, the Service is proposing a number of revisions to eagle nonpurposeful (incidental) take permit regulations (50 Code of Federal Regulations CFR 22.26) and eagle nest take regulations (50 CFR) 22.27. The proposed actions include a modified definition of the statutory eagle preservation standard, revisions to take limits, permit duration, the permit fee schedule at 50 CFR 13.11, several definitions in 50 CFR 22.3, two provisions that apply to all eagle permits (50 CFR 22.4 and 22.11), and minor revisions to the golden eagle nest take permits for resource development and recovery (50 CFR 22.25).

A summary of the five alternatives analyzed in this PEIS is presented below:

Alternative 1: No Action

Under the No Action alternative, revisions to the eagle rule would not be adopted and the current permit program would be continued.

EMUs for the bald eagle would continue to be configured roughly in accordance with the eight Service Regions that cover the United States. EMUs for the golden eagle would match the Bird Conservation Regions (BCRs) west of the 100th geographical meridian (or line of longitude). BCRs are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues.

The permitted take level per EMU for the bald eagle would be 5% of estimated annual productivity. The permitted take level per EMU for the golden eagle would be 0%, unless take is offset, and golden eagle take cannot be authorized east of the 100th meridian. The Service developed and applies guidance on upper limits of take at more local scales to manage cumulative impacts to local populations. Under the guidance, the Service assesses take rates both for individual projects and for the cumulative effects of other human caused take of eagles, at the scale of the local area population (LAP) of eagles. The LAP analysis involves compiling information on permitted take of eagles within a specified distance (derived from each eagle species' natal dispersal distance) of the proposed activity's boundary. If permitted eagle take exceeds 1% of the estimated population size of either species within the LAP area, additional take is of concern. The number of eagles in the LAP is derived by applying the estimated eagle density at the EMU scale to the LAP area.

Nonpurposeful standard take permits could be issued for up to five years for take that does not recur. Standard permits must avoid and minimize take to the maximum degree practicable. The

Service may issue nonpurposeful programmatic take permits for up to five years for disturbance and for take resulting in eagle mortality, based on implementation of advanced conservation practices (ACPs) developed in coordination with the Service. Under these permits, take must be unavoidable. Compensatory mitigation requirements would not be clarified, so compensatory mitigation could be required for any eagle take permit. Standard permit application fees would be $500; programmatic five-year permit fees would be $36,000.

Removal of eagle nests would be permitted where (1) necessary to alleviate a safety emergency to people or eagles; (2) necessary to ensure public health and safety; (3) the nest prevents the use of a human-engineered structure; or (4) the activity, or mitigation for the activity, will provide a net benefit to eagles. Only inactive nests may be taken except in the case of safety emergencies.

The Service's definitions for "advanced conservation practices", "area nest population", "eagle nest", "inactive nest", "maximum degree achievable", "programmatic take", "programmatic take permit" and "territory" would remain the same. There would be no new definitions.

Management Common to All Action Alternatives

This section addresses the elements that are common to all four action alternatives. The baseline population size for both species is the number of estimated eagles in 2009 populations. The amount of authorized take that would be considered part of the baseline, and therefore not subject to an offsetting mitigation requirement in populations where the take limit is zero, would be unchanged from the 2009 numbers. The Service would establish an EMU for the golden eagle east of the 100th meridian and allow issuance of permits for golden eagles in the eastern U.S. Under all the action alternatives, take levels in the eastern U.S. would be set at zero unless the take is offset.

USFWS definitions of "eagle nest" and "practicable" would be revised. New definitions would be created for "alternate nest", "EMU", "in-use nest", and "nesting territory". Definitions of "inactive nest", "ACPs", "area nesting population", "maximum degree achievable", "territory", "programmatic take", and "programmatic permit" would be removed.

The Service would revise the language of 50 CFR 22.11(c) to allow the appropriate use of ESA Section 7 when issuing eagle permits that may affect listed species.

For Golden Eagle Nest Take Permits for Resource Development and Recovery (50 CFR 22.25), the requirement for the Service to evaluate whether there is suitable nesting habitat available within the area nesting population would be revised to require evaluation of whether an alternate nest is available within the territory from which the nest is being removed.

For 50 CFR 22.26 nonpurposeful take permits, the name would be changed to "incidental take". Compensatory mitigation requirements would be clarified. There would be one permit type only, rather than standard permits and programmatic permits. All permits would contain the standard that take must be avoided and minimized to the maximum degree practicable. Service-approved protocols for pre-application surveys and risk modeling would be required.

For 50 CFR 22.27 nest take permits, there would be one permit type only, rather than standard permits and programmatic permits. The requirement to implement ACPs to reduce take to the point where any remaining take is unavoidable, which currently applies to programmatic permittees, would be eliminated. Provisions for additional flexibility to issue permits would be added when there is no significant biological impact to eagles.

Alternative 2: Current EMUs, Liberal Take

EMUs for the bald eagle would be in a configuration that roughly approximates Service Regions. EMUs for the golden eagle would be based on BCRs west of the 100th meridian; BCRs east of the 100th meridian would be combined into one EMU. Take limits would be set at 0% for golden eagles and 8% of populations for bald eagles in most EMUs, with lower rates proposed in the Southwest (4.5%) and Alaska (0.7%).

The maximum duration of incidental take permits would remain five years. Take would need to be minimized to the maximum degree practicable. Compensatory mitigation would be required for, and limited to, permits that would exceed EMU take limits. Compensatory mitigation for take above take EMU take limits would be offset at 1:1 ratio for bald and golden eagles Incidental take permit application processing fees for permits less than five years would be $500. For five-year permits, the fee would be $36,000.

The LAP analysis would remain guidance and not incorporated into the regulations.

Alternative 3: Current EMUs, Conservative Take

As with Alternative 2, EMUs for the bald eagle would roughly approximate Service Regions. EMUs for the golden eagle would be based on BCRs west of the 100th meridian; BCRs east of the 100th meridian would be combined into one EMU. Take limits would be set at 0% for golden eagles and 6% of populations for bald eagles in most EMUs, with lower rates proposed in the Southwest (3.8%) and Alaska (.8%). The proposed take limit for Alaska is the same number of eagles as in the liberal alternative but the estimated population size is more conservative with the result that the rate to meet that limit slightly higher.

The Service could issue incidental take permits for up to 30 years. Take would need to be minimized to the maximum degree practicable.

Compensatory mitigation designed to offset impacts at a 1:1 ratio would be required for any permitted take that exceeds EMU take limits. Separate and distinct from compensatory mitigation to offset take above the take EMU take limit, Alternative 3 would require for each take permit a minimum level of compensatory mitigation, preferably in the form of a contribution to a third-party mitigation provider (and which could be used for habitat protection or another beneficial action not directly aimed at reducing a mortality factor).

Compensatory mitigation for take that exceeds EMU take limits would be at a 1:1 ratio for bald and golden eagles.

Incidental take permit application processing fees for permits less than five years would be $500. For permits five years or more, the fee would be $36,000. Permit administration fees for permits with a duration that exceeds five years would be increased to $15,000 every five years to support the Service's ability to conduct the five-year evaluations.

The LAP analysis would remain guidance and not incorporated into the regulations.

Alternative 4: Flyway EMUs, Liberal Take

The Service and its partner agencies manage for migratory birds based on flyways, or specific migratory route paths within North America. Based on those route paths, state and federal agencies developed the four administrative flyways that administer migratory bird resources. Under Alternative 4, the EMUs for the bald eagle would coincide with the Atlantic, Mississippi, Central, and Pacific flyways used by the Service and its partner agencies. The Pacific flyway would be divided into three EMUs: southwest, mid-latitude, and Alaska. EMUs for the golden eagle would also coincide with the flyways, with the Mississippi and Atlantic flyways combined as one EMU.

Take limits would be set at 0% for golden eagles and 8% of populations for bald eagles in most EMUs, with lower rates proposed in the Southwest (4.5%) and Alaska (0.7%).

The maximum duration of an incidental take permits would remain at five years. Take would need to be minimized to the maximum degree practicable. Incidental take permit application processing fees for permits less than five years would be $500. For permits of five years, the fee would be $36,000.

Compensatory mitigation would be required for all permits that would exceed EMU take limits, some permits that exceed LAP take limits, or if otherwise necessary for the permit to be compatible with the preservation of eagles. Compensatory mitigation would be at 1:1 ratio for bald and golden eagle take above EMU take limits.

The definition of "compatible with the preservation of eagles" would be modified to incorporate greater protection at more local scales. The LAP cumulative effects analysis would be incorporated into the regulations. Analysis of Service-authorized take within the LAP would be required. Take would not be authorized if it would exceed 5% of the estimated total LAP size unless additional analysis is conducted and demonstrates that permitting take over 5% of that LAP is compatible with the preservation of eagles.

Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)

EMUs for the bald eagle would coincide with the flyways. The Pacific flyway would be divided into three EMUs: southwest, mid-latitude, and Alaska. EMUs for the golden eagle would also coincide with the flyways, with the Mississippi and Atlantic flyways combined as one EMU.

Take limits would be set at 0% for golden eagles and 6% of populations for bald eagles in most EMUs, with lower rates proposed in the Southwest (3.8%) and Alaska (0.8%).

The Service could issue incidental take permits for up to 30 years. Take would need to be minimized to the maximum degree practicable.

Compensatory mitigation would be required for permits that would exceed EMU take limits, some permits that exceed LAP take limits, or if otherwise necessary for the permit to be compatible with the preservation of eagles. Compensatory mitigation would be designed to offset at a ratio of 1:1 for bald eagles and greater than 1:1 for golden eagles when take exceeds EMU take limits.

The definition of "compatible with the preservation of eagles" would be modified to incorporate greater protection at more local scales. The LAP cumulative effects analysis would be incorporated into the regulations. Analysis of Service-authorized take within the LAP would be required and not authorized if it would exceed 5% of the estimated total LAP size unless additional analysis is conducted and demonstrates that permitting take over 5% of that LAP is compatible with the preservation of eagles.

Incidental take permit application processing fees for permits less than five years would be $500. For permits five years or more, the fee would be $36,000. Permit administration fees for permits with a duration that exceeds five years would be increased to $15,000 every five years to support the Service's ability to conduct the five-year evaluations.

Summary of Potential Impacts

This document analyzes the predicted impacts of each alternative on eight impact topics and in comparison to the No Action alternative. The topics analyzed are: Bald Eagle, Golden Eagle, Eagle Habitat, Migratory Birds, Other Permitted Take, Cultural and Religious Issues, Socioeconomic Resources, and Climate Change. For each alternative, the Service analyzed the potential environmental impacts that would likely occur.

Bald Eagle

In general, three of the five alternatives would most likely allow the Service to meet the management objective of providing for stable or increasing breeding populations of bald eagles on a national scale over the coming century if take were authorized up to the proposed take limits. Under these three alternatives: the No Action (1); Current EMUs, Conservative Take (3); and Flyway EMUs, Conservative Take (5), take levels would be set low enough so that the uncertainty around the sustainable take rate is weighted in roughly an 80:20 ratio towards being more protective of bald eagles than may be necessary to foster stable or growing populations over the course of the century. In Alternative 2 – Current EMUs, Liberal Take (2), EMU take limits are set such that the uncertainty around the sustainable take rate is shared equally between the risk of over-regulating take and the risk of not providing for stable or growing populations. Alternative 4 – Flyway EMUs, Liberal Take (4) would provide a higher certainty of meeting management goals because of its provisions to protect eagles at a more local scale and its increased opportunities to secure compensatory mitigation compared to Alternative 2, but overall the risk is of over-harvesting versus over-regulating is balanced, and so the certainty of meeting the population objective is lower than for Alternatives 1, 3, and 5.

Because of increased authorized and unauthorized take, none of the alternatives would permit the bald eagle population to reach the estimated theoretical demographic carrying capacity of this species in the U.S.; the eventual equilibrium population (the population size at which growth would stop some decades in the future) would be somewhat below this level.

Over the coming century, bald eagle populations across the entire continent will face a number of cumulative factors in combination, the effects of which range from uncertain, such as from climate change, to adverse, such as habitat destruction and fragmentation from human population growth and related land and resource development, proliferation of power lines, poisoning by methyl mercury and other toxins, collisions with vehicles and aircraft, and others.

Nevertheless, there is reason to expect that while the net effect of cumulative anthropogenic factors on bald eagle numbers in the lower 48 states is negative, and will become even more so in the foreseeable future given added human population, development, and anthropogenic climate change, bald eagle numbers can continue to increase for decades to come.

Alternative 5 would lend itself more than any of the others to adaptive management in the face of the uncertainties and challenges associated with climate change and other anthropogenic environmental disturbances in the coming decades.

Golden Eagle

Recent studies conducted by the Service, U.S. Geological Survey (USGS), and other partners have shown that anthropogenic causes may be responsible for more than half (56%) of all golden eagle mortality in the U.S. Major anthropogenic factors include shootings, collisions, electrocution, poisonings, and lead toxicity. Human-caused mortality is high enough at present that it may be causing a decline in the nationwide golden eagle population to a level not only well below the estimated theoretical demographic carrying capacity for the species in the U. S., but even below the 2009 level, which is the Service's population objective against which attainment of the Service's management objective, maintenance of stable or increasing breeding populations of golden eagles, is measured.

As a result of these circumstances, the Service has set the take rate for all incidental take permits at 0% in each of the EMUs unless additional take is offset by compensatory mitigation. Of the five alternatives, only Alternative 5 has a reasonable chance of stabilizing populations at 2009 levels. This is because Alternative 5: (1) calls for a greater than 1:1 compensatory mitigation ratio; (2) allows for 30-year permits, which is expected to incentivize project proponents to apply for permits and then implement avoidance, minimization, and compensatory mitigation measures; and (3) includes a modified preservation standard and incorporates the LAP take limit to ensure the persistence of local eagle populations.

The golden eagle faces many of the same challenging environmental trends and adverse cumulative factors as described for the bald eagle above. In the case of the golden eagle, however, these increasingly adverse future circumstances are likely to have a more pronounced negative effect on populations. In part this is because golden eagles have a lower maximum intrinsic growth rate, lower overall population size, and appear to be more sensitive to human disturbance and encroachment than bald eagles.

Some of the larger intentional and unintentional anthropogenic causes of golden eagle mortality (e.g., shootings, poisonings, lead toxicosis) can probably be somewhat reduced through educational and enforcement activities, and unintended, incidental take from electrical energy facilities like wind turbine blades and power line electrocutions reduced through retrofitting, innovative designs and proper siting, but these advances will take a renewed and redoubled level of commitment, research, funding, and permit coverage. Alternative 5 lends itself most to adaptive management in the face of the increasing anthropogenic environmental disturbances as the 21st century proceeds.

Eagle Habitat

Under the No Action alternative, there would be no direct adverse impacts to eagle habitat from the continued implementation of authorized take of eagles. There would be negligible to major indirect adverse impacts from potential loss, alteration, and fragmentation of habitat, and reduced habitat values and suitability during implementation of permitted projects. Golden eagle habitat in the East would continue to be adversely impacted by unauthorized projects. Because the application of compensatory mitigation for bald eagles would continue to be applied in many cases even though take is within take limits, the beneficial effects on habitat would vary from moderate to major.

Alternative 2 would have no direct adverse impacts to eagle habitat from the implementation of revised authorized take of eagles. There would be indirect negligible to major adverse impacts from potential loss, alteration, and fragmentation of habitat, and reduced habitat values and suitability during implementation of permitted projects. Authorizing take of golden eagles in the East would be possible, resulting in a reduction of adverse impacts and some beneficial effects on golden eagle habitat, if metrics for offsetting golden eagle take through habitat enhancement and protection can be established. Standardized compensatory mitigation impacts could be beneficial but would be minor. When compensatory mitigation is not required, no benefits to eagle habitat would occur. Liberal take levels for bald eagles in this alternative have the potential for greater indirect adverse impacts on eagle habitat than alternatives with conservative take levels. Conversion of unauthorized take to authorized take may result in lower overall adverse impacts on eagle habitat through compensatory mitigation.

Alternative 3 would have minor to moderate beneficial impacts from compensatory mitigation but there would also likely be more overall beneficial impacts in this alternative because of the additional conservation measures that would be secured from greater compliance because of the extension of maximum permit duration. Conservative take levels for bald eagles in this alternative would have less indirect adverse impact to eagle habitat than alternatives with liberal take levels because compensatory mitigation designed to fully and demonstrably increase the eagle population by one eagle for each eagle taken would be required for all permits once the conservative take limit is reached. The impacts of this requirement on eagle habitat would by minor because it would be confined to habitat enhancement and restoration actions that can be shown to be additive and thus offset take. However, the requirement that every incidental take permit involve a minimum level of compensatory mitigation distinct from the any compensatory mitigation required for take that would exceed EMU take limits would provide moderate benefits to habitat for both species.

Impacts in Alternative 4 would be similar as Alternative 2, but with some differences. Compensatory mitigation could be required if permits are issued that exceed the LAP take limit, potentially providing greater benefits to eagle habitat. Alternative 4 also would provide some flexibility to require compensatory mitigation in circumstances other than where take would exceed LAP take limits, when the Service determines it is warranted to meet the preservation standard. That provision would likely have beneficial impacts to eagle habitat, but those would be minor to moderate because its application is expected to be rare. There would be less overall adverse impacts on eagle habitat than under Alternative 2, which also has liberal take levels but where the LAP analysis is not incorporated into regulations. The proposed modified Preservation Standard that would be codified in Alternative 4 includes an added level of protection for eagles at the local scale and thus could indirectly protect habitat.

Impacts in Alternative 5 would include many impacts from Alternatives 3 and 4, with some differences. There would likely be additional beneficial effects on golden eagle habitat by increasing the compensatory mitigation ratio to greater than 1:1 because the compensatory mitigation above 1:1 could be used for habitat protection. Combining the LAP analysis with conservative take levels in this alternative would reduce adverse impacts on eagle habitat more than when the LAP analysis is combined with liberal take levels as in Alternative 4. There would be less overall adverse impact on eagle habitat than under Alternative 3, which has conservative take levels but where the LAP analysis is not incorporated into regulations. Thus, the combination of conservative take levels and the LAP analysis under Alternative 5 would have the least amount of adverse impacts on eagle habitat than any other alternative. The proposed modified Preservation Standard that would be codified in Alternative 5 includes an added level of protection for eagles and habitat at the local scale.

Migratory Birds

Under the No Action alternative, there would be no direct adverse impacts to migratory birds from the continued implementation of authorized take of eagles. There would be negligible to moderate indirect adverse impacts to migratory birds and habitat due to possible take of birds during implementation of permitted projects and from potential habitat loss and alteration. Compensatory mitigation conducted for eagles could have both adverse, but more likely beneficial negligible to moderate effects on migratory birds, depending on the species.

Alternative 2 would have no direct adverse impacts to migratory birds from the implementation of revised authorized take of eagles. There would be negligible to moderate indirect adverse impacts to migratory birds and habitat due to possible take of birds during implementation of permitted projects and from potential habitat loss and alteration. Liberal take levels for bald eagles in this alternative would lead to greater indirect adverse impacts on migratory birds than alternatives with conservative take levels. Compensatory mitigation could have minor to moderate beneficial or, in a minority of cases, adverse impacts on migratory birds, depending on the species.

Conservative EMU take levels for bald eagles in this Alternative 3 would lead to less indirect adverse impacts on migratory birds than alternatives with liberal take levels because of the increased amount of compensatory mitigation required for take that exceed EMU take limits. Additionally, the requirement that every incidental take permit involve a minimum level of compensatory mitigation would provide additional benefits to migratory birds. Some adverse impacts could occur to migratory birds through such mitigation, but the effects are much more likely to be moderately beneficial overall. Extension of the maximum permit duration would also increase compliance and thereby secure additional conservation measures. Thus, the beneficial or adverse effects of compensatory mitigation on migratory birds would be greater overall under Alternative 3 than under Alternative 2.

Impacts to migratory birds from Alternative 4 would be similar but not identical to Alternative 2. Alternative 4 would provide some flexibility to require compensatory mitigation in circumstances other than where take would exceed EMU or LAP take limits, if the Service determines it is warranted to meet the preservation standard. That provision would likely have minor to moderate beneficial impacts to migratory birds' habitat. The application of compensatory mitigation in flyway EMUs may not affect migratory bird species in the local project area if those species do not use the mitigation area during part of the year. If requested take is not authorized in an LAP area, some new projects may not be implemented, and adverse impacts on migratory birds would not occur.

Impacts from Alternative 5 would largely be a combination of many of the impacts from Alternatives 3 and 4. The effects of compensatory mitigation on migratory birds is more likely to occur at some distance away from a project area in the flyway EMUs, but the migration patterns of many migratory bird species do mirror the flyways or some portion thereof. The overall beneficial or adverse effects of compensatory mitigation on local populations of migratory birds would likely be greater under Alternative 5 than under Alternative 4, due to increased compliance and the implementation of associated conservation measures that is expected if maximum permit duration is extended. If requested take is not authorized in an LAP area, new projects would not be implemented, and adverse impacts on migratory birds would not occur.

Other Permitted Take

Under the No Action alternative, no impacts to other permitted take are anticipated from the continuation of the current regime.

Under all the Action Alternatives, the proposed take limit is unlikely to cause any change in the number of permits issued for other permitted take for the bald eagle in Alaska or the rest of the U.S, outside of the Southwest. Given that recent take history is about equal to the baseline take in 2009 and far below the limit in most EMUs, it is unlikely there would be any change in the number of permits issued for other permitted take. For the golden eagle, given that its recent take history, including lethal and non-lethal take (average of 20 eagles and 6 inactive nests per year) is lower than baseline take (58 eagles, 6 nests), it does not appear that a zero limit without offsetting mitigation would impact the number of eagle permits granted for other permitted take overall. None of the changes in eagle management or the regulations that would be implemented under the Action Alternatives (e.g., different EMU configurations, changes in permit duration, codification of the LAP cumulative take analysis, etc.) would likely affect the Service's administration of other permitted take.

Cultural and Religious Issues

For all alternatives, Eagle American Indian Religious Take (EAIRT) permits are given first priority after safety emergencies and would maintain that priority. Authorized take for any purpose would have minor, adverse impacts on some tribes whose cultural value depends on the presence eagles in the wild and thus oppose taking eagles. These impacts could also be felt by conservationists or anyone who might perceive the authorized take of bald eagles as compromising the nation's symbol (especially under Alternatives 2 and 4). The compensatory mitigation requirements for Alternatives 2 and 4 would likely further exacerbate those types of adverse impacts to tribes, conservationists, and other members of the public who revere bald eagles, because less compensatory mitigation would be required under those alternatives.

The No Action alternative could have minor, adverse impacts to two tribes east of the 100th meridian that are unable to obtain an EAIRT permit if they were to request religious take permits but are unable to show that their historic take has been ongoing and thus part of the baseline. All action alternatives would have beneficial minor impacts to tribes east of the 100th meridian requesting EAIRT permits.

Under Alternatives 3 and 5, extending the tenure to 30 years would likely increase the issuance of take permits, including permits issued in or near Traditional Cultural Properties (TCPs), causing minor adverse impacts to tribes. However, the permitting process requires compliance with the NHPA, so the issuance of eagle take permits is more likely to help steer projects away from TCPs.

The modestly increased supply of eagle remains from incidental take permittees at the National Eagle Repository (NER) could reduce wait times, providing moderate beneficial impacts to some tribal members. Under Alternatives 4 and 5, the shift to flyway EMUs would better address geographic patterns of risk given seasonal movement patterns, and the re-evaluations every five years under Alternatives 3 and 5 would enable the Service to more accurately monitor eagle populations (i.e., from Service-approved survey protocols), recommend more appropriate conservation measures, and achieve management objectives, which would benefit EAIRT permittees in the long-term. Alternatives 4 and 5 also include a revised and codified preservation standard that adds protection for eagles at a more local scale, and would make the LAP cumulative effects analysis a requirement in the regulations. Both of these additions would help ensure that eagles persist throughout their ranges. However, the compensatory mitigation for golden eagle take at greater than 1:1 ratio proposed under Alternative 5, combined with its compensatory mitigation provisions, modification of the preservation standard, and codification of the LAP analysis would have the greatest conservation benefits for eagles in all flyway EMUs, and the most significant benefits to tribal cultural values in the long-term.

Socioeconomic Resources

The No Action alternative would have minor adverse impacts to developers east of the 100th meridian who are unable to request a permit and the financial risk and cost of criminal prosecution of operating without an eagle permit would be significant in the short- and long-term. Unknown costs and uncertainties associated with nonstandardized compensatory mitigation requirements for take within EMU limits and the five-year tenure of current nonpurposeful programmatic take permits could dissuade potential investors and create minor adverse impacts.

Under all action alternatives, the issuance of permits for golden eagles east of the 100th meridian would create beneficial impacts to developers that were previously unable to obtain a permit. A simpler permit issuance process with established requirements for compensatory mitigation would reduce uncertainty and unknown costs to companies, and the establishment and use of third-party mitigation funds would also help with the compensatory mitigation decision process.

Under Alternatives 2 and 4, higher take levels for bald eagles would cause minor adverse impacts to recreational and aesthetic values associated with eagles due to the perception that the bald eagle population would decline. If bald eagle take levels were reached, there is a 50% chance that populations would decline as a result of the authorized take, but it is unlikely that demand for bald eagle permits would be high enough to approach the liberal take levels under these alternatives, except possibly in the southwest EMU.

Requiring a minimum level of compensatory mitigation under Alternative 3 and the additional compensatory mitigation requirements for LAP impacts under Alternatives 4 and 5 would be more costly for project proponents compared to Alternative 2.

Under Alternatives 3 and 5, extending the maximum duration of incidental take permits to 30 years would create beneficial impacts to applicants over long-term for renewable energy and public infrastructure projects because the tenure would more closely match the long-term financial agreements or contracts. Companies are more likely to weigh the benefits of obtaining a permit as higher than the risk of federal prosecution, and these two alternatives would represent the most significant beneficial impact to developers and the Service alike. Under Alternative 5, small or new companies (with projects sited in an area with high risk to eagle mortality) may not have the capital to absorb or amortize compensatory mitigation costs at a rate greater than 1:1, therefore adverse impacts could be moderate to significant for these projects.

The compensatory mitigation for golden eagle take at greater than 1:1 ratio proposed under Alternative 5, combined with its compensatory mitigation provisions, modification of the preservation standard, and incorporation of the LAP analysis would have the greatest conservation benefits for eagles in all flyway EMUs, and the most significant benefits to Americans who value eagles recreationally, aesthetically, and otherwise in the long-term.

Climate Change

It is unclear whether the proposed new regulations would actually increase wind energy development, or simply increase the number of such projects that operate with incidental take permits. If the number of wind projects is the same as it would have been without the new permit regulations, then the impact of the regulations on climate change would be negligible, although the overall impact of increasing wind energy development (unrelated to the proposed rule revisions) would be positive as the volume of greenhouse gas (GHG) emissions replaced by new wind energy grows over time. If the volume of development increases over what it would have been without the new permit regulations, then the increased amount of fossil fuel emissions that are replaced by wind energy production could provide a greater beneficial impact from the proposed action, although in the context of planetary emissions the impact on climate change would still be minor.

CONTENTS

FIGURES:

TABLES:

CHAPTER 1: PURPOSE AND NEED FOR AGENCY ACTION

This chapter presents the purpose and need for agency action, decisions to be supported by the Programmatic Environmental Impact Statement (PEIS), and background and history important in the development of the *Eagle Rule Revision Programmatic Environmental Impact Statement*. Organizational information for the PEIS is provided along with sections describing related National Environmental Policy Act (NEPA) compliance actions and a summary of the public involvement process.

1.1 INTRODUCTION

Pursuant to NEPA, this PEIS analyzes the potential impacts to the human environment that may result from implementation of proposed revisions by the United States Fish and Wildlife Service (USFWS or Service) to several eagle permit regulations that authorize take of bald and golden eagles and eagle nests pursuant to the Bald and Golden Eagle Protection Act (Eagle Act; 16 United States Code [U.S.C.] 668-668d).

The NEPA analysis will evaluate the environmental effects of a range of alternatives for eagle management. The NEPA analysis is also intended to:

- Evaluate up-to-date information about the status of bald and golden eagle populations;
- Enable the Service to recalculate national and regional take limits for both species (if population management will continue to incorporate regional take limits);
- Analyze the effects of issuing permits to take golden eagles and bald eagles throughout the U.S.;
- Further analyze the effects of longer-term, incidental take permits; and
- Evaluate the effects of authorizing take of eagles up to certain levels both at the regional and local population scales to allow for more efficient permitting at the individual project level (see *Section 1.5.2, Tiering*).

1.2 BACKGROUND

The Eagle Act prohibits take of bald eagles and golden eagles except pursuant to federal regulations. The Eagle Act allows the Secretary of the Interior to issue regulations to authorize the "taking" of eagles for various purposes, including the protection of "other interests in any particular locality." In 2009, the Service promulgated regulations in Title 50, part 22 of the Code of Federal Regulations (CFR) that established two new permit types for take of eagles and eagle nests (50 FR 46836, September 11, 2009). One permit authorizes, under limited circumstances, the take (removal, relocation, or destruction) of eagle nests (50 CFR 22.27). The other permit type authorizes nonpurposeful take (disturbance, injury, or killing) of eagles (50 CFR 22.26) where the take is incidental to an otherwise lawful activity. The regulations provide for standard permits, which authorize individual instances of take that cannot practicably be avoided, and programmatic permits, which authorize recurring take that is unavoidable even after implementation of advanced conservation practices.

The Eagle Act requires the Service to determine that any take of eagles it authorizes is "compatible with the preservation of bald eagles or golden eagles." In the preamble to the final regulations for eagle nonpurposeful take permits, and in the Final EA of the 2009 regulations, the Service defined that standard to mean "consistent with the goal of stable or increasing breeding populations" (74 FR 46838).

On April 13, 2012, the Service initiated two additional rulemakings: (1) a proposed rule ("Duration Rule") to extend the maximum permit tenure for programmatic eagle nonpurposeful take permit regulations from 5 to 30 years (77 Federal Register [FR] 22267), and (2) an Advance Notice of Proposed Rulemaking (ANPR) soliciting input on all aspects of those eagle nonpurposeful take regulations (77 FR 22278).

The ANPR highlighted three issues for public comment: the agency's overall eagle population management objectives; compensatory mitigation required under permits; and the nonpurposeful take programmatic permit issuance criteria. As a next step, the Service issued a Notice of Intent (NOI) to Prepare an Environmental Assessment (EA) or EIS pursuant to NEPA (79 FR 35564, June 23, 2014). The Service then held five public scoping meetings between July 22 and August 7, 2014.

The Duration Rule was finalized on December 9, 2013 (78 FR 73704). However, it was the subject of a legal challenge and on August 11, 2015, the District Court of Northern California vacated the provisions that extended the maximum programmatic permit tenure to 30 years. The court held that the Service should have prepared an EA or EIS rather than apply a categorical exclusion under NEPA. The effect of the ruling was to return the maximum programmatic permit term to five years.

The 2012 ANPR, 2014 NOI and scoping meetings, and this PEIS were undertaken to improve the Service's permitting and conservation framework for eagles. In the six years since the new permits became available, new developments, changing circumstances, and new information need to be analyzed and incorporated into the Service's management objectives for eagles.

Bald eagle populations have continued to increase in most areas of the U.S. There has also been significant expansion of the wind energy industry, among other energy industries. These, and other developments, have contributed to the perception that the current permitting framework does not provide enough flexibility to issue eagle take permits. Indeed, few programmatic permits have been issued to date. When projects go forward without permit authorization, the opportunity to obtain benefits to eagles in the form of required conservation measures is lost and project operators are putting themselves at risk of violating the law.

Under the current management approach, established with the 2009 eagle permit regulations and Final EA of the Service's regulatory permitting system under the Eagle Act, permitted take of bald eagles is capped at 5% of estimated annual productivity (successful reproduction) of the population. Because the Service lacked data to show that golden eagle populations could sustain any additional unmitigated mortality at that time, the Service set take limits for that species at zero for all regional populations. This has meant that any new authorized take of golden eagles must be at least equally offset by compensatory mitigation (specific conservation actions to replace or offset project-induced losses).

Since 2009, Service and U.S. Geological Survey (USGS) scientists have undertaken considerable research and monitoring to improve the Service's ability to track compliance with the quantitative management objectives of our eagle permitting program and to reduce uncertainty with the goal of increasing management flexibility. Of particular significance, the Service has updated population estimates for both species of eagle and quantified uncertainty in those estimates. For the bald eagle, the Service now estimates substantially higher populations than in 2009, and allowable take limits will likely increase considerably across most of the country as a result. For golden eagles, recent research has confirmed the Service's assessment of status and population size in 2009. Additionally, the Service now has a much better understanding of the seasonal, annual, and age-related movement patterns of golden eagles. These data need to be incorporated into the management framework.

In the Final EA for the 2009 regulations and in the preamble to those regulations, the Service adopted a policy of not issuing take permits for golden eagles east of the 100th meridian. At the time, the Service determined there were not sufficient data to ensure that golden eagle populations were stable or increasing such that permitting take would not result in a decline in breeding pairs in this region. However, after further analysis, the Service has determined that some take can be permitted with implementation of offsetting mitigation. Rather than providing an increased level of protection for golden eagles, this policy has meant that activities that take golden eagles in the east continue to proliferate without implementation of conservation measures and mitigation to address impacts to golden eagles that would be required as the result of the permitting process.

In implementing the 2009 permit regulations, the Service has identified provisions that could be improved for the benefit of both eagles and people. Currently, the circumstances under which the Service can issue eagle nest take permits (50 CFR 22.27) are limited, which can lead to situations where landowners may be disproportionately burdened with little conservation benefit to eagles. Revised provisions may be warranted to appropriately balance the protection of important nest sites for eagles with the need to minimize unnecessary regulatory burden to the public.

Another issue that has hampered efficient permit administration (of both eagle nonpurposeful take permits and eagle nest take permits) is the difficulty inherent in applying the standard that take must be reduced to the point where it is unavoidable, which the current regulations require for programmatic permits. Additionally, a lack of specificity in the regulations as to when compensatory mitigation is required can lead to inconsistencies in what is required of permittees.

Finally, the five-year maximum permit term for programmatic permits has proven to be a deterrent for businesses engaged in long-term activities that have the potential to incidentally take bald or golden eagles over the lifetime of the activity. With longer-term permits, the Service would have the ability to build adaptive management measures into the permit conditions. This approach provides a degree of certainty to project proponents because they understand what may be required to remain compliant with the terms and conditions of their permits in the future. This allows companies to plan accordingly by allocating resources so they will be available if needed to implement additional conservation measures if needed to benefit eagles.

The Service cannot require any entity to apply for an eagle take permit (except under legal settlement agreements), with the result that some project proponents decide to “take their chances” by building and operating without eagle take permits in areas where eagles are likely to be taken. When this occurs, the opportunity to achieve mitigation and conservation measures is lost, and for that reason, the Service believes that permitting long-term activities that are likely to incidentally take eagles, including working with project proponents to minimize the impacts, and securing compensatory mitigation, is preferable to foregoing that opportunity because companies perceive the permit process as being more onerous than it should be. Enforcement becomes the other option when entities take eagles without permits, and the Service is actively engaged in numerous investigations focused on incidental take of eagles.

1.3 Purpose and Need

The purpose of this action is to establish updated management objectives and a permitting framework that will ensure preservation of eagles while decreasing the regulatory burden and increasing certainty for those engaged in otherwise lawful activities. The revised permit regulations need to be implementable within a reasonable timeframe and without consuming a disproportionate share of the Service’s increasingly limited resources.

Bald eagle populations continue to expand throughout their U.S. range. Golden eagles in the coterminous U.S. are at best stable, and may be in the early stages of a decline to a lower population size. Unauthorized sources of human-caused mortality are a significant factor affecting population trends and size, particularly for golden eagles. The Service’s incidental take permit regulations provide an opportunity to bring many activities into compliance with the Eagle Act, and in doing so, secure avoidance, minimization, and compensatory mitigation measures to reduce and offset detrimental impacts to eagles. However, the current incidental take permit regulations appear to have offered insufficient incentive to bring many project proponents and developers to the table. Consequently, conservation opportunities are lost.

To satisfy the purpose and need, the selected alternative should:

- Increase compliance by simplifying the permitting framework and increasing certainty;
- Allow for consistent and efficient administration of the program by Service staff;
- Be based on best available science and data; and
- Enhance protection of eagles throughout their ranges by increasing implementation of avoidance, minimization, and mitigation of adverse impacts from human activities.

1.4 Proposed Action

The Service is proposing to update its management objectives for bald and golden eagles and revise its 2009 permit regulations for incidental take of eagles and take of eagle nests. The management objective directs strategic management and monitoring actions and, ultimately, determines what level of permitted eagle take can be allowed, consistent with the Eagle Act.

The current management objective for both bald and golden eagles is to ensure that authorization of take be consistent with the goal of maintaining the potential for stable or increasing breeding populations over 100 years, which would span at least eight generations of eagles. We considered at least four elements when establishing the management objective: (1) the population objective and relevant timeframe for it to be met; (2) the delineation of eagle management units (EMUs), or the geographic scale, over which permitted take is regulated to meet the population objective; (3) whether to also set an upper limit on take at a finer scale than the EMU to avoid creating population sinks in local breeding populations; and (4) the appropriate level of risk tolerance. The level of risk tolerance means how much risk to eagle populations the agency is willing to take in carrying out management actions (e.g., setting levels of authorized take) when information is uncertain. For example, when information is less certain, we may adopt a more conservative approach to avoid unintended outcomes. Alternatively, to provide for more flexibility in permitting, the Service could adopt a more risk-tolerant approach. These elements could be different for the two eagle species, resulting in a separate management objective for each.

To achieve these management objectives, the Service is proposing a number of revisions to eagle nonpurposeful (incidental) take permit regulations (50 CFR 22.26) and eagle nest take regulations (50 CFR 22.27). One proposed revision would extend the maximum permit duration from five to thirty years. The proposed actions also include revisions to the permit fee schedule at 50 CFR 13.11, several definitions in 50 CFR 22.3, and two provisions that apply to all eagle permits (50 CFR 22.4 and 22.11).

1.5 NEPA PROCESS

The Service is developing this PEIS in accordance with NEPA, Council on Environmental Quality (CEQ) NEPA implementing regulations, and the Service's NEPA implementing procedures. This PEIS examines the potential direct, indirect, and cumulative environmental impacts associated with the proposed development and implementation of eagle management and the permitting framework.

The purpose of this PEIS is to inform the Service’s decision makers and the public of the potential environmental consequences of the proposed action and its alternatives. An interdisciplinary team of eagle experts, regulatory experts, biologists, environmental scientists, socioeconomists, planners, and NEPA specialists prepared this PEIS. The Service received public input on the issues to be analyzed during the scoping process for this project (see *Section 6.1, Public Participation*).

The breadth of subject matter in this NEPA document and the nature of the environmental resources potentially affected require that the Service consider many laws, regulations, and Executive Orders (EO) related to environmental protection. These authorities are addressed in various sections of this document where they are relevant to particular environmental resources and conditions. *Section 1.6, Authorities* provides a list of the applicable laws and regulations considered in development of this PEIS.

1.5.1 Programmatic Analysis

The NEPA Task Force, established by the CEQ in 2002, reported that "Programmatic NEPA analyses and tiering can reduce or eliminate redundant and duplicative analyses and effectively address cumulative effects" (CEQ, 2003). A programmatic environmental document such as this PEIS is prepared when an agency is proposing to carry out a broad action, program, or policy.

The programmatic approach creates a comprehensive, analytical framework that supports subsequent analyses of specific actions at site- and ecoregion-specific locations within the nation. Programmatic analysis can save resources by providing NEPA coverage for an entire program, allowing subsequent NEPA analyses to be more narrowly focused on specific activities at specific locations.

1.5.2 Tiering

Tiering is a staged approach to NEPA described in CEQ's NEPA Implementing Regulations (40 CFR 1508.28). Tiering addresses broad programs and issues in the initial analysis and analyzes site-specific actions and impacts in subsequent NEPA tiered studies. The geographic region for this PEIS is the entire United States (U.S.), thus the Service would be able to tier additional site-specific environmental analyses under NEPA as actions that would flow out of this PEIS. This PEIS is a first-tier environmental review. The Service anticipates tiering subsequent EAs for site-specific projects involving incidental take of eagles off of this PEIS. The purpose of tiering subsequent EAs is to avoid repetitive discussions of the same issues previously addressed in this PEIS and to focus on the actual issues ready for decision.

For the most part, when permitting projects that (a) will not take eagles above the EMU take limits (unless it is offset); (b) will not result in cumulative authorized take within the LAP exceeding 5%; and (c) will fulfill their compensatory mitigation requirements via methods that will offset the take, subsequent environmental analyses under NEPA would need to only summarize the issues discussed in the PEIS and incorporate by reference discussions from the PEIS. One exception is the analysis of migratory birds due to the broad-brush programmatic approach in this PEIS. The Service is in the process of developing regulations to authorize incidental take under the MBTA. The Service published an NOI to prepare an EIS on May 26, 2015 (80 FR 30032) and held four scoping meetings in different U.S. cities. For more information, go to: http://birdregs.org/. Tiered NEPA analyses should address specific migratory bird species impacts to the extent that this PEIS does not cover them. Any future environmental analyses should concentrate on the issues specific to the site and type of project.

A screening form for use by project proponents to determine if a project falls under the scope of this PEIS would be developed. A separate NEPA analysis (i.e., EA or EIS) would need to be conducted if the screening form identifies that one or more resources have not been fully addressed by this PEIS. In addition to filling out the screening form, project applicants would need to follow specific criteria and data collection requirements for permit applications and submissions as specified in the revised rule to clearly show how many eagles they anticipate taking so as to determine if a project should be able to tier from this PEIS.

1.6 AUTHORITIES

The principal federal authority for the actions analyzed in this PEIS is the Eagle Act. The Service is the federal agency with primary statutory authority for the management of bald eagles and golden eagles in the U.S. Regulations implementing the Eagle Act are in Subparts C & D of Part 22 of Title 50 of the CFR.

The proposed action is in compliance with the following federal statues, regulations, EOs, and Department of the Interior policy, including:

Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668–668d)

The Eagle Act provides that the Secretary of the Interior may authorize certain, otherwise-prohibited activities through promulgation of regulations. The Secretary is authorized to prescribe regulations permitting the "taking, possession, and transportation of [bald or golden eagles] . . . for the scientific or exhibition purposes of public museums, scientific societies, and zoological parks, or for the religious purposes of Indian tribes, or . . . for the protection of wildlife or of agricultural or other interests in any particular locality," provided such permits are "compatible with the preservation of the bald eagle or the golden eagle" (16 U.S.C. 668a). In accordance with this authority, the Secretary has previously promulgated Eagle Act permit regulations for scientific and exhibition purposes (50 CFR 22.21), for Indian religious purposes (50 CFR 22.22), to take depredating eagles (50 CFR 22.23), to possess golden eagles for falconry (50 CFR 22.24), and for the take of golden eagle nests that interfere with resource development or recovery operations (50 CFR 22.25). This rulemaking revises permit regulations to authorize non-purposeful eagle take "for the protection of . . . other interests in any particular locality."

The analysis in this PEIS evaluates whether the proposed permit revisions and their implementation, including limits on annual take, are compatible with the preservation of the bald eagle and the golden eagle.

National Environmental Policy Act (NEPA) (42 U.S.C. 4321–4347)

Agencies must complete environmental documents pursuant to NEPA before implementing federal actions. NEPA requires careful evaluation of the need for action, and that federal actions are considered alongside all reasonable alternatives, including the No Action alternative. NEPA also requires the action agency to consider the potential impacts on the human environment of each alternative. The decision maker(s) must consider the alternatives and impacts prior to implementation, and must inform the public of these deliberations.

The Service has prepared this PEIS in compliance with NEPA; the President's CEQ Regulations, (40 CFR 1500–1508); and the NEPA-compliance requirements in the Department of the Interior's Departmental Manual (DM) and the Service's Manual (FW) (516 DM 8, 550 FW 1-3, 505 FW 1-5).

Pursuant to NEPA and CEQ regulations, this PEIS documents the analysis of a proposed federal action and all reasonable alternatives, including the No Action alternative. The PEIS evaluates impacts anticipated from all alternatives; informs decision-makers and the public; and aids decision-making by ensuring that NEPA and CEQ regulations have been incorporated into federal agency planning and decision-making. The Service prepared this PEIS using an interdisciplinary approach to address all aspects of the natural and social sciences relevant to the potential impacts of the project. The PEIS analyzes the direct, indirect, and cumulative effects of the proposed action and alternatives.

Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531–1544)

It is federal policy under the ESA that all federal agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the ESA (§ 2(c)). Federal action agencies must consult with the Service under Section 7 of the ESA to ensure that "any action authorized, funded, or carried out by such an agency … is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species. Each agency shall use the best scientific and commercial data available" (§ 7(a)(2)). Whether the Service's future issuance of an individual eagle permit will trigger a duty by the Service to consult under the ESA will depend on whether the Service has included any particular conditions or required changes to a project that may affect listed species or critical habitat. If the Service's proposed permit conditions or requirements may affect listed species or critical habitat, the Regional Permit Office will coordinate intra-Service Section 7 consultations at the permit stage.

Migratory Bird Treaty Act, as amended (MBTA) (16 U.S.C. 703–712)

The MBTA implements the United States' commitment to four international treaties (with Canada, Japan, Mexico, and Russia) for the protection of a shared migratory bird resource. Each of the treaties protects most species of birds that are common to both countries. Under the MBTA, it is illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird unless authorized under regulations or by a permit. Both bald and golden eagles are protected under the MBTA. However, for activities that would take eagles, a separate MBTA authorization in addition to an Eagle Act authorization is not required because 50 CFR 22.11(a) exempts those who hold Eagle Act permits from the requirement to obtain an MBTA permit.

National Historic Preservation Act of 1966, as amended (NHPA) (54 U.S.C 300101 *et seq.*)

Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties. Federal agencies accomplish this by following the Section 106 regulations, "Protection of Historic Properties" (36 CFR Part 800). The Section 106 regulations set forth a process by which agencies: (1) evaluate the effects of any federal undertaking on historic properties (properties included in, or eligible for inclusion in, the National Register of Historic Places (National Register)); (2) consult with State Historic Preservation Officers (SHPO), Tribal Historic Preservation Officers (THPOs), and other appropriate consulting parties regarding the identification and evaluation of historic properties, assessment of effects on historic properties, and the resolution of adverse effects; and (3) consult with appropriate American Indian tribes (tribes) and Native Hawaiian Organizations (NHOs) to determine whether they have concerns about historic properties of religious and cultural significance in areas of these federal undertakings.

American Indian Religious Freedom Act (AIRFA) (42 U.S.C. 1996)

AIRFA sets forth federal policy to protect and preserve the inherent right of American Indians to express and exercise their traditional religions, including, but not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites. Given the special trust relationship between the federal government and federally-recognized Indian tribes, the accommodation of tribal religious practices is in furtherance of the duty of the federal government to promote tribal self-determination. AIRFA will be construed in conjunction with the Service’s trust responsibility to federally recognized tribes.

Executive Order 13007, Indian Sacred Sites (61 FR 26771, May 29, 1996)

In managing federal lands, each executive branch agency with statutory or administrative responsibility for the management of federal lands shall, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency function, (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and (2) avoid adversely affecting the physical integrity of such sacred sites. When deemed necessary, each Regional Permit Office will coordinate with the Regional Historic Preservation Officer and Regional Native American Liaison (NAL) to ensure implementation of the proposal is in compliance with this Order.

Executive Order 13175, Consultation and Coordination with Tribal Governments (65 FR 67249, Nov. 9, 2000)

This EO emphasizes the need for regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, the responsibility to strengthen the U.S. government-to-government relationships with Indian tribes, and the responsibility to reduce the imposition of unfunded mandates upon Indian tribes. Each Service Regional Director, in coordination with the Service Regional NAL, conducts government-to-government consultation with the tribes in their region and will do so on permits under this proposal. In order to ensure consistent, appropriate consultation, the implementation guidance for this proposal, which will also be available for public comment, will contain guidelines on government-to-government consultation. To facilitate coordination of our multiple responsibilities, the Service’s tribal consultations will advise the tribes that it is providing them notice under all applicable federal mandates, and the Service will list them: AIRFA, the Eagle Act, EO 13007 (if applicable), EO 13175, and NHPA. The Service will also indicate that notice and invitation to consult is being provided in an effort to carry out our trust responsibility to tribes, with regard to the unique traditional religious and cultural significance of eagles to Native American communities, and in furtherance of the reserved rights of native communities with respect to eagles.

Department of the Interior Secretarial Order 3317, Policy on Consultation with Indian Tribes (December 1, 2011)

The purpose of this Order is to update, expand, and clarify the Department's policy on consultation with American Indian and Alaska Native tribes; and to acknowledge that the provisions for conducting consultation in compliance with EO 13175, Consultation and Coordination with Indian Tribal Governments, and applicable statutes or administrative actions are expressed in the Department of the Interior Policy on Consultation with Indian tribes.

The policy strives to include elements that:

- Honor the government-to-government relationship;
- Involve the appropriate level of decision maker in a consultation process;
- Promote innovations in communication by including a Department-wide tribal governance officer;
- Detail early tribal involvement in the design of a process implicating tribal interests; and
- Capture a wide range of policy and decision-making processes under the consultation umbrella.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (66 FR 3853, Jan. 17, 2001)

This EO specifies the need to avoid or minimize adverse impacts on migratory bird resources when conducting agency actions, as well as the need to restore and enhance the habitat of migratory birds. The proposed action, through its standards for incorporation of avoidance and minimization measures, is consistent with the goals of this EO. The local Ecological Services and Regional Offices will review any mitigation proposals to ensure they do not adversely affect populations of other migratory bird species.

Department of Interior Departmental Manual 522 DM 1 Adaptive Management Implementation Policy

This policy from the Department of the Interior states that bureaus should incorporate the operational components identified in the report, Adaptive Management (AM): The U.S. Department of the Interior Technical Guide. These components are: the AM definition; the conditions under which AM should be considered; and the process for implementing and evaluating AM effectiveness. The proposed action will be consistent with the Order.

Tribal and State Statutes

As of the writing of this document, four states still list the bald eagle endangered, and 13 consider it threatened under state statutes (see Appendix A). Two states consider the golden eagle endangered, and one state considers it as a threatened species. Nothing in the proposed regulation revisions will prohibit individual states or tribes from considering either eagle species as threatened or endangered according to their statutes. Nor will the proposed regulation prohibit states or tribes from developing more stringent protection for either species.

Take of eagles may not be allowed without having obtained necessary tribal and state permits and/or certificates or registration. It is beyond the scope of this document to provide specific information regarding each tribe’s or state’s permit requirements. However, it is the responsibility of each applicant to contact the respective tribal and state wildlife agency to determine permitting requirements.

The Service will determine, upon application, whether there is a valid justification for the permit. In addition, permits will include this proviso: "The authorization granted by permits issued under this section is not valid unless you are in compliance with all other federal, tribal, state, and local laws and regulations that are required to conduct the permitted activity." Permittees found to be out of compliance with such other laws and regulations are subject to revocation of their permits under the Eagle Act.

Each Service region will coordinate and consult with their respective tribes and states on a case-by-case basis; however, it is the Service’s intent that this management framework increase regular communication with states and tribes on overall eagle management programs.

1.7 Decisions to be Made

The decision to be made is whether to authorize specific revisions to eagle rule regulations, which include:

- Whether to retain the current EMUs as the scale for assessing eagle populations for purposes of permitting actions.
- Whether to define “compatible with the preservation of the bald eagle or the golden eagle” to incorporate a local scale.
- What level of risk tolerance to adopt in managing eagles.
- Whether to make adjustments to the level of take the Service may authorize for either or both species of eagle within EMUs.
- What level or levels of compensatory mitigation to require for eagle take permits.
- Whether to revise various provisions of the eagle nonpurposeful take permit regulations for purposes of providing clarity, promoting compliance, and facilitating implementation.
- Whether to amend the permit regulations for take of eagle nests to provide more flexibility to issue permits to remove nests that have low biological value.

With its final decision, the Service will approve the alternative that is determined to be preferred. The preferred alternative is the alternative which the Service believes would best fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors.

1.8 Environmental Issues

Specific topics were considered for impact analyses and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on federal laws, regulations, and EOs, and from issues raised during internal and external scoping. A brief rationale for the selection of each impact topic is provided in this section, as well as the rationale for dismissing specific topics from further consideration.

1.8.1 Topics Discussed in Detail

Bald Eagle

Permitted take, based on eagle management objectives, including population objectives, EMUs, and the level of risk tolerance, would directly affect bald eagle populations. Therefore, bald eagles are addressed as an impact topic in this PEIS.

Golden Eagle

Permitted take, based on eagle management objectives, including population objectives, EMUs, and the level of risk tolerance, would directly affect golden eagle populations. Therefore, golden eagles are addressed as an impact topic in this PEIS.

Eagle Habitat

Conservation and mitigation measures required as part of standard and programmatic permits would affect eagle habitat. Therefore, eagle habitat is addressed as an impact topic in this PEIS.

Migratory Birds

Eagle conservation measures can potentially have direct or indirect impacts on migratory birds. Therefore, migratory birds are addressed as an impact topic in this PEIS.

Other Permitted Take

The level of take for both bald and golden eagles may affect the number of eagle permits available for other permitted take, if requests for permits exceed the number compatible with the preservation of eagles. Therefore, other permitted take is addressed as an impact topic in this PEIS.

Cultural and Religious Resources

Eagles are important to most tribes for religious and cultural reasons. Establishing limits for eagle take permits may affect the occasional availability of permits for Native American religious and cultural use. Numerous tribes, conservationists, or anyone who might perceive authorized take of bald eagles as compromising the nation's symbol are concerned about the Service's permitted take of eagles. Therefore, cultural and religious resources are addressed as an impact topic in this PEIS.

Socioeconomic Resources

Permit availability, limits, and permit issuance criteria and conditions may affect the planning and implementation of projects. Therefore, socioeconomic resources are addressed as an impact topic in this PEIS.

Climate Change

An important category of actions for which eagle permits have been requested is wind energy development. Because an important objective of wind energy development is to avoid greenhouse gas emissions (which are the primary anthropogenic contributor to global climate change), to the extent that the proposed action could lead to additional deployment of wind energy, the indirect impacts of the proposed action on climate change are addressed as an impact topic in this PEIS.

1.8.2 Topics Considered But Dismissed

Environmental Justice

EO 12898 General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Native Americans are considered a potentially affected environmental justice community. The impacts of the proposed action on Native Americans are discussed in detail in *Section 3.7, Cultural and Religious Issues*. Beyond that, the action project would not have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the U.S Environmental Protection Agency’s (EPA) Draft Environmental Justice Guidance (July 1996). Therefore, environmental justice was dismissed from further consideration in this PEIS.

Prime and Unique Farmlands

In August 1980, the CEQ directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops, such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops, such as fruits, vegetables, and nuts. Proposed actions would not affect farmland as defined in Title 7, Chapter 73, Section 4201 (c)(1) of the Farmland Protection Policy Act. Therefore, this impact topic was dismissed from further consideration in this PEIS.

Floodplains

EO 11988 Floodplain Management requires an examination of impacts to floodplains and potential risks involved in placing facilities within floodplains. No impacts are anticipated to occur to floodplains from the proposed actions. Because there would be no impact to floodplains, this topic is dismissed from further consideration in this PEIS.

Wetlands

EO 11990 Protection of Wetlands directs that wetlands be protected, and that wetlands and wetland functions and values be preserved. These orders and policies further direct that impacts to wetlands be avoided when practicable alternatives exist. No impacts are anticipated to occur to wetlands from the proposed actions. Because there would be no impacts to wetlands, this topic is dismissed from further consideration in this PEIS.

Threatened and Endangered Species

The ESA of 1973 requires federal action agencies to ensure that "any action authorized, funded, or carried out by such an agency … is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species" (§ 7(a)(2)). The Service's rulemaking will neither affect nor jeopardize the continued existence of any species designated as endangered or threatened or modify or destroy its critical habitat because none of the proposed alternatives here authorize, fund, or carry out any activity as a threshold matter. Moreover, none of the proposed alternatives here authorize, fund, or carry out any activity that could affect listed species or critical habitat because an eagle take permit is not required to construct or operate a project. Rather, an eagle permit merely authorizes eagle take that may result from a project's construction or operation. The Service's rulemaking also is consistent with conservation programs for those species.

Safety

Safety of humans and eagles may be affected under a proposed revision to 22.27(a)(1)(iii) (provision for removal of nests that render a human engineered structure inoperable) to allow issuance of a permit for removal of inactive nests in order to maintain or provide necessary upgrades to public utilities, cell phone towers, and other public service infrastructure. This would include nests being built or currently attended (and therefore "active" under the current definition) but where no eggs have been laid. Also, the existing provision would be revised to allow nest removal that will lead to a structure becoming inoperable. These revisions should increase public safety and safety of eagles by allowing for nest removal prior to an emergency becoming manifest and before eggs have been laid in the nest. Because impacts on safety would be minimal, this topic is dismissed from further consideration in this PEIS.

1.9 Organization of the PEIS

This PEIS consists of nine chapters and five appendices. Information in the chapters and appendices are organized as follows.

- Chapter 1, "Purpose and Need for Agency Action," provides an introduction to the purpose and need for action, background, and the methods through which the public has been and can continue to be involved with the preparation of the document and the decision-making process.
- Chapter 2, "Alternatives," provides descriptions of the alternatives and how they were developed, a description of alternatives initially considered that were subsequently eliminated from detailed study in this PEIS, and a summary of environmental impacts by alternative.
- Chapter 3, "Affected Environment and Environmental Consequences," first describes the potentially affected environment for the impact topics addressed, including bald eagle, golden eagle, eagle habitat, other permitted take, cultural and religious resources, socioeconomic resources, and climate change. This information is provided as the baseline against which the impacts of each of the alternatives can be compared. Then, the potential impacts of the proposed action and alternatives are discussed for each impact topic.
- Chapter 4, "Cumulative Impacts," describes the cumulative impacts of the proposed action. The chapter presents information regarding the cumulative impacts of past, present, and foreseeable future actions and trends by the Service and other entities.

- Chapter 5, "Sustainability and Long-term Management," addresses potential future irreversible and irretrievable commitments of resources.
- Chapters 6, 7, 8, and 9 are the "Consultation and Coordination," "References," "Acronyms and Glossary," and "Index" chapters, respectively.
- Appendices are included to provide more detailed information to support the PEIS.

CHAPTER 2: ALTERNATIVES

2.1 INTRODUCTION

This chapter considers alternatives that provide a reasonable range of options for population management parameters and revisions to regulations that permit take of bald eagles and golden eagles. The alternatives provide different approaches for:

- Take rates and risk levels for bald and golden eagles;
- Geographic scale/eagle management units (EMUs);
- Mitigation requirements for eagle take permits;
- Maximum permit duration (tenure) for incidental eagle take permits;
- Incidental eagle take permit criteria and conditions; and
- Eagle nest take permit provision.

The PEIS presents the biological foundations for setting permit take limits for bald eagles and golden eagles and outlines permit management according to populations, Bird Conservation Regions (BCR), Service Regions, and flyways. The document also discusses programmatic approaches to permitting, summarizes key aspects of the alternatives, and identifies the Service's Preferred Alternative.

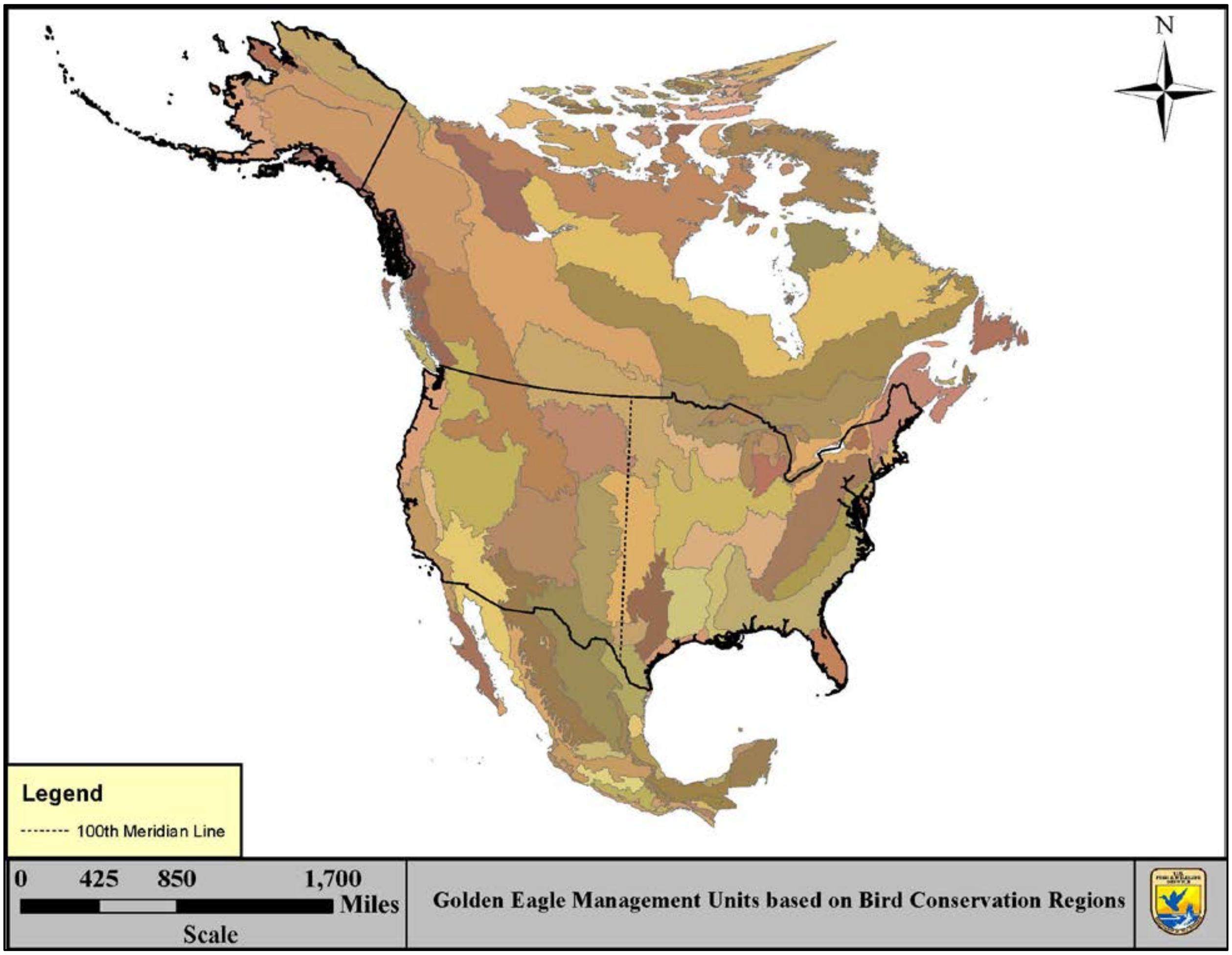
2.2 ALTERNATIVE 1: NO ACTION

The current management objective, also referred to as the "Eagle Act preservation standard," is to manage populations consistent with the goal of stable or increasing breeding populations (USFWS, 2009a). The baseline population size for both species is the number of estimated eagles in 2009 populations.

EMU

The geographic scale the Service uses to evaluate eagle populations is referred to as an eagle management unit (EMU). EMUs for the golden eagle were set at the BCR level (Figure 2.2-1) because the Service's monitoring for golden eagles is designed to yield BCR-scale population estimates. Additionally, no permits can be issued east of the 100th meridian for golden eagles.

To establish management populations for bald eagles, the Service used maps of known nesting territories and information on natal dispersal distances to delineate more-or-less geographically distinct breeding populations. Natal dispersal refers to the movement between a hatching location and first breeding or potential breeding location. Because the populations delineated by this approach roughly correspond to the Service's regional organizational structure, the Service has been managing bald eagles based on populations within the eight Service Regions (Figure 2.2-2), with some shared populations. Estimates of bald and golden eagle population size in each EMU were calculated, and EMU-specific estimates of demographic rates were used in models to determine rates of authorized take that are compatible with maintaining the potential for stable breeding populations.



Note: Shaded areas on the map represent individual BCRs. Go to http://www.nabci-us.org/bcrs.htm to view an interactive map with BCR region descriptions.

Figure 2.2-1. EMUs for golden eagles based on BCRs.

Take Levels for Bald and Golden Eagles

Under the current management approach, permitted take of bald eagles is capped at 5% estimated annual productivity. Because the Service lacked data to show that golden eagle populations could sustain any additional unmitigated mortality in 2009, take limits were set for that species at zero for all EMUs. This means that any new authorized "take" of golden eagles must be at least equally offset by compensatory mitigation (specific conservation actions to replace or offset project-induced losses). The Service has referred to this type of compensatory mitigation as "offsetting mitigation" to distinguish it from other types of compensatory mitigation consisting of conservation measures designed to improve conditions for eagles.

The Service also developed and applies guidance on upper limits of take at more local scales to manage cumulative impacts to local populations. Under the guidance, the Service must assess take rates both for individual projects and for the cumulative effects of other human caused take of eagles, at the scale of the local area eagle population (LAP). The LAP analysis involves compiling information on permitted anthropogenic mortality of eagles within a specified distance (derived from each eagle species' natal dispersal distance) of the permitted activities' boundary. If permitted eagle take exceeds 1% of the estimated population size of either species within the LAP area, additional take is of concern. If take exceeds 5% of the estimated population size within the LAP area, additional take is considered inadvisable unless the permitted activity will actually result in a lowering of take levels (e.g., permitting a repowered wind project that, in its repowered form, will take fewer eagles than before repowering). The number of eagles in the LAP is derived by applying the estimated eagle density at the EMU scale to the LAP area.

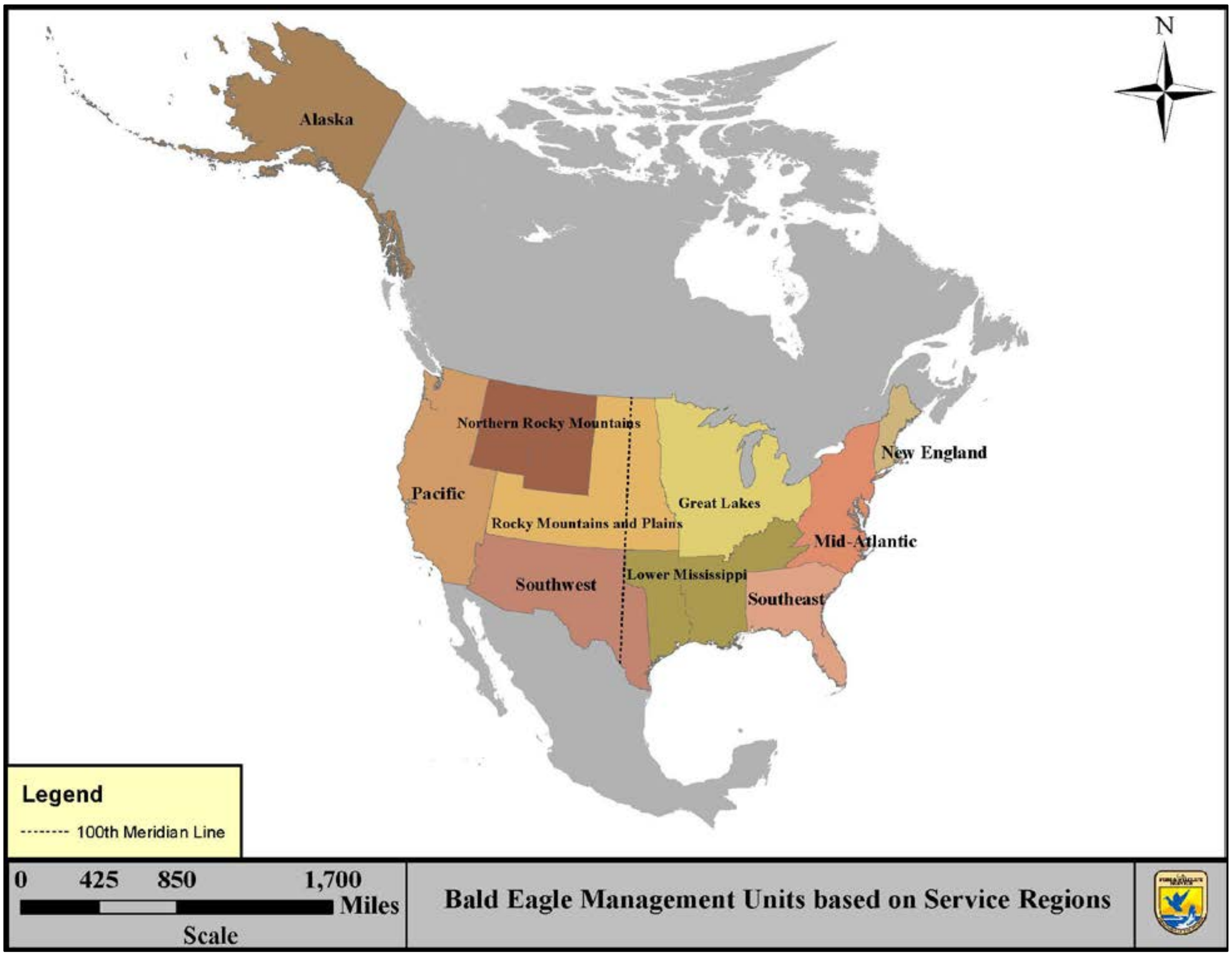


Figure 2.2-2. EMUs for bald eagles based roughly on Service regions.

It is not practical to conduct a formal quantitative analysis of unpermitted take as part of the LAP analysis due to the lack of specific data about background levels of anthropogenic mortality in a given area. Current estimates of golden eagle survival rates suggest that on average about 18 to 20% of golden eagles die each year, and about 56% of these mortalities are from anthropogenic causes. Thus, background levels of golden eagle anthropogenic mortality within an average LAP appear to be roughly 10%. However, knowledge of the actual magnitude of eagle fatalities at a specific LAP scale is lacking, and areas where many eagle deaths are known may just be better studied, and not actually reflect higher than normal fatality rates. Due to this uncertainty, the quantitative step of the LAP analysis considers only Service-permitted take. Nonetheless, other information available on unpermitted anthropogenic take is also qualitatively considered in making a permit decision. If there are data for a particular area that suggest cumulative anthropogenic take is higher than average (i.e., > ~10 of the LAP population for golden eagles), and that with additional permitted take might exceed average background levels of the LAP population, that would be strong evidence against authorizing additional take.

Ideally, the Service would be able to identify the proportion of eagle mortality at a permitted facility that is composed of eagles from the LAP versus migrants or dispersers from elsewhere. The Service could then limit take in such a way so as to not compromise the ability of the LAP to provide a rescue effect to the area around a project where take is occurring and to ensure particular source populations of migrants or wintering/summering eagles are not disproportionately affected. The Service and partners are making progress towards developing genetic and isotope methods that will allow for this level of assignment, but those tools are not yet available.

Permits

Nonpurposeful Take Permits (50 CFR 22.26)

Current regulations provide for both standard permits, which authorize individual instances of take that cannot practicably be avoided, and programmatic permits, which authorize recurring take that is unavoidable even after implementation of Advanced Conservation Practices (ACPs). The Service has issued standard permits for commercial and residential construction, transportation projects, maintenance of utility lines and dams, and in a variety of other circumstances where take is expected to occur in a limited timeframe and specific location. For instance, take that does not reoccur, such as temporary abandonment of a nest, or is caused solely by indirect effects, does not require a programmatic permit, but may require a standard permit.

“Programmatic take” of eagles is defined at 50 CFR 22.3 as “take that is recurring, is not caused solely by indirect effects, and that occurs over the long-term or in a location or locations that cannot be specifically identified.” The Service may issue programmatic permits for up to five years for disturbance and for take resulting in mortalities, based on implementation of ACPs developed in coordination with the Service. ACPs are “scientifically supportable measures approved by the Service that represent the best available techniques to reduce eagle disturbance and ongoing mortalities to a level where remaining take is unavoidable” (50 CFR 22.3). In an informal review in 2014 of programmatic permit requests across the U.S., the Service found that 16 of 23 permit requests were from wind facility developers; the remainder were from electric utilities (three for transmission lines) or Department of Defense (three for training activities), with one for other construction activities (USFWS, 2014a). Most take authorized under §22.26 has been in the form of disturbance. However, permits may authorize lethal take that is incidental to an otherwise lawful activity, such as mortalities caused by collisions with wind turbines, power line electrocutions, and other potential sources of incidental take.

Programmatic permittees must conduct rigorous monitoring of the permitted activity designed to yield valuable information about the actual take level and the conditions under which the take occurred. In this way, programmatic permits present opportunities for research and development of conservation measures to avoid and reduce eagle take.

Because take limits for golden eagles have been set at zero throughout the U.S., in order to meet eagle preservation goals, all permits for golden eagle take must incorporate compensatory mitigation after all appropriate and practicable avoidance and minimization measures are employed. The same applies to bald eagles in the Southwest EMU. For take that would exceed EMU take limits, compensatory mitigation must consist of actions that at least equally replace or offset project-induced losses. For take that exceeds EMU take limits, compensatory mitigation designed to replace bald and golden eagles at a 1:1 ratio would be required. Protection of existing eagle habitat in its current state is not a viable compensatory mitigation measure for take that would exceed take thresholds because it is not additive. However, habitat enhancement and restoration along with protection can be used if they can be demonstrated to increase carrying capacity in the EMU, thus effectively offsetting an increase in mortality. Compensatory mitigation must be within the same EMU as the take.

For take that does not exceed EMU take limits, the 2009 regulations did not incorporate specific compensatory mitigation provisions. The Service may require compensatory mitigation on a case-by-case basis. The current regulations provide that "mitigation measures determined by the Director as reasonable and specified in the terms of your permit to compensate for the detrimental effects, including indirect effects, of the permitted activity."

The maximum permit duration for both standard and programmatic permits is five years.

Eagle Nest Take Permits (50 CFR 22.27)

These permits authorize removal of eagle nests where (1) necessary to alleviate a safety emergency to people or eagles, (2) necessary to ensure public health and safety, (3) the nest prevents the use of a human-engineered structure, or (4) the activity, or mitigation for the activity, will provide a net benefit to eagles. Only inactive nests may be taken except in the case of safety emergencies.

2.3 MANAGEMENT COMMON TO ALL ACTION ALTERNATIVES

This section addresses the elements that are common to all four action alternatives. The baseline population size for both species is the number of estimated eagles in 2009 populations. The amount of authorized take that would be considered part of the baseline, and therefore would not be subject to an offsetting mitigation requirement in populations where the take limit is zero, would be unchanged from the 2009 numbers.

The Service would establish an EMU for the golden eagle east of the 100th meridian and allow issuance of permits for golden eagles in the eastern U.S. Under all the action alternatives, take levels in the eastern U.S. would also be set at zero unless the take is offset because there are no breeding populations of golden eagles in the eastern U.S. Therefore, any take of golden eagles east of the 100th meridian would need to be compensated for with offsetting mitigation.

The Service is proposing a number of revisions to its eagle permit regulations that are included in all the action alternatives.

Definitions (50 CFR 22.3)

- Advanced Conservation Practices (removed).
- Alternate nest (new): "One of potentially several nests within a nesting territory that is not an in-use nest at the current time. When there is no in-use nest, all nests in the territory are alternate nests."
- Area nesting population (removed).
- Eagle Management Unit (new): "The geographic scale over which permitted take is regulated to meet the management objective."
- Eagle nest: (revised): "Any assemblage of materials built, maintained, or used by bald eagles or golden eagles for the purpose of reproduction."
- Inactive nest: (removed).
- In-use nest (new): "A bald or golden eagle nest characterized by the presence of one of more eggs, dependent young, or adult eagles on the nest in the past ten days during the breeding season."
- Maximum degree achievable (removed).
- Nesting territory (new): "The area containing one or more eagle nests within the home range of a mated pair of eagles, regardless of whether such nests were built by the current resident pair."
- Practicable (revised): "Capable of being done after taking into consideration, relative to the magnitude of the impacts to eagles, the following three things: the cost of remedy compared to the scope and scale of the project; existing technology; and logistics in light of overall project purposes."
- Programmatic take (removed).
- Programmatic take permit (removed).
- Territory (removed).

Scope of Eagle Regulations (50 CFR 22.11)

The Service would revise § 22.11(c) to replace "[Y]ou must obtain a permit under part 21 of this subchapter for any activity that also involves migratory birds other than bald and golden eagles, and a permit under part 17 of this subchapter for any activity that also involves threatened or endangered species other than the bald eagle" with "[A] permit under this part authorizes take, possession, and/or transport only under the Bald and Golden Eagle Protection Act and does not provide authorization under the Migratory Bird Treaty Act or the Endangered Species Act for the take, possession, and/or transport of migratory birds or endangered or threatened species other than bald or golden eagles." The original language was promulgated prior to the bald eagle being removed from the ESA List of Endangered and Threatened Wildlife as part of a final rule authorizing transport of eagle parts. The original intent of § 22.11(c), as explained in the Federal Register notice accompanying its publication, was that a permit holder transporting items that contained not only eagle parts, but also parts of other species protected by the Endangered Species Act or the Migratory Bird Treaty Act, into or out of the country would need to ensure he or she possessed the applicable permits for those protected, non-eagle species in order to legally transport the item. *See* 64 FR 50467. However, this provision could be read to limit the Service's discretion to decide the appropriate manner of authorization for activities that affect other protected species outside the context of transportation of items containing eagle parts. For example, § 22.11(c) could be read to preclude the Service from using intra-Service Section 7 consultation to analyze and exempt non-jeopardizing ESA take that may result from the Service's issuance of an Eagle Act permit to a project proponent. Thus, we are proposing to amend § 22.11(c) to ensure it does not limit our discretion to apply the appropriate authorization under the ESA or the MBTA for activities that involve other species protected by those statutes.

Golden Eagle Nest Take Permits for Resource Development and Recovery (50 CFR 22.25)

The requirement for the Service to evaluate whether there is suitable nesting habitat available within the area nesting population would be revised to require evaluation of whether another nest site is available within the territory from which the nest is being removed.

- Minor revisions would be made for purposes of consistency with the § 22.27 nest take permit regulations.

Incidental Take Permits (50 CFR 22.26)

- Change name from “nonpurposeful take” to “incidental take.”
- Compensatory mitigation requirements would be clarified.
- There would be one permit type, only, rather than standard permits and programmatic permits.
- All permits would contain the standard that take must be avoided and minimized to the maximum degree practicable.
- The requirement to implement ACPs to reduce take to the point where any remaining take is unavoidable, which currently applies to programmatic permittees, would be eliminated.
- Service-approved protocols for pre-application surveys and risk modeling would be required.
- The permit application processing fee for permits up to 5 years in duration would increase from $500 to $2,500 for commercial entities.

Nest Take Permits (50 CFR 22.27)

- There would be one permit type only, rather than standard permits and programmatic permits.
- The requirement to implement ACPs to reduce take to the point where any remaining take is unavoidable, which currently applies to programmatic permittees, would be eliminated.
- Revisions would allow removal of in-use nests to prevent a rapidly developing safety emergency that is likely to occur while the nest is still in use for breeding purposes.
- Revisions would allow removal of in-use nests prior to egg-laying to prevent the creation of a functional hazard that renders a human-made structure inoperable.
- The requirement that suitable nesting habitat be available to displaced eagles for non-emergency nest take would be removed. This provision has been problematic because in many healthy populations of bald eagles, suitable nest sites are all occupied. The regulations would retain the requirement that the Service consider the availability of alternative suitable nesting habitat, but a finding that there is would not be a prerequisite for issuing a permit
- There would be a provision for the Service to waive the requirement that nestlings and viable eggs be transported to a foster nest or permitted rehabilitator. In some geographic locations, transport of nestlings to rehabilitators is not possible. Nests with viable eggs or nestlings can be removed only in safety emergencies, so the requirement sometimes means that the Service cannot issue a permit necessary to alleviate the safety emergency.
- The permit application processing fee would increase from $500 to $2,500 for commercial entities. The permit application processing fee for permits to take multiple nests would increase to $5,000 from $1,000.

2.4 Alternative 2: Current EMUs, Liberal Take Levels

Eagle Management Units

The scale the Service would use to evaluate eagle populations under this alternative would be the same as under Alternative 1. EMUs for the golden eagle would be at the BCR level (Figure 2.2-1). Management populations for bald eagles would correspond to the Service's regional organizational structure based on populations within the eight Service regions, with some shared populations (Figure 2.2-2).

Take Levels of Bald and Golden Eagles – Liberal

Take limits (for take that is not required to be offset) would be set at 0% for golden eagles and 8% of populations for bald eagles in most EMUs, with lower rates proposed in the Southwest (4.5%) and Alaska (0.7%)[1].

[1] In Alaska, because of uncertainties in the population size estimate, managers propose to maintain the take limit for bald eagles at 500, as was recommended in 2009 (USFWS, 2009a), which yields a take rate of 0.7% for the liberal alternatives and 0.8% in the conservative alternatives in Alaska. Because the proposed take limit for Alaska

Permit Regulations

The Service would make the revisions described in Management Common to All Action Alternatives, plus:

- Compensatory mitigation would be limited to permits that would exceed EMU take limits.
- For take that exceeds EMU take limits, compensatory mitigation designed to replace bald and golden eagles at a 1:1 ratio would be required.

2.5 ALTERNATIVE 3: CURRENT EMUs, CONSERVATIVE TAKE LEVELS, PERMIT DURATION INCREASE

Eagle Management Units

The scale the Service would use to evaluate eagle populations under this alternative would be the same as under Alternatives 1 and 2. EMUs for the golden eagle would be at the BCR level (Figure 2.2-1). Management populations for bald eagles would correspond to the Service's Regional organizational structure based on populations within the eight Service regions, with some shared populations (Figure 2.2-2).

Take Levels of Bald and Golden Eagles – Conservative

Take limits (for take not required to be offset) would be set at 0% for golden eagles and 6% of populations for bald eagles in most EMUs, with lower rates proposed in the Southwest (3.8%) and Alaska (.8%). The proposed take limit for Alaska is the same number of eagles as in the liberal alternative but the estimated population size is more conservative with the result that the rate to meet that limit is slightly higher.

Permit Regulations

This alternative would include the revisions described in Management Common to All Action Alternatives, plus:

- Maximum duration of permits would be extended to 30 years. The Service would evaluate each permit at no more than five-year intervals. These evaluations would reassess fatality rates, effectiveness of measures to reduce take, the appropriate level of compensatory mitigation, and eagle population status. Additional commitments with regard to conservation measures may be required of long-term permittees at the five-year permit evaluations. In 2013, when the maximum term of programmatic take permits was extended from five to 30 years (a change subsequently vacated by court order in 2015), language was included in the regulations limiting additional conservation measures that could be required of the permittee to those contemplated at the time the permit was issued. However, that language was based on the requirement that all permittees would be required to implement ACPs that reduce take to the point where it is unavoidable. As part of the

is the same number of eagles as in the liberal alternative but the estimated population size is more conservative, the result is that the rate to meet that limit is slightly higher in the conservative than the liberal alternatives.

Management Common to All Action Alternatives, all permittees would be required to undertake all practicable measures to reduce take. The requirement to implement ACPs to reduce take to the point where any remaining take is unavoidable would be eliminated. Under this Alternative 3, to ensure eagles are adequately protected, based on the results of the five-year evaluations, the Service may, after negotiation with permittees, require that long-term permittees undertake additional conservation measures that are practicable and reasonably likely to reduce risk to eagles based on the best scientific information available. Circumstances where additional conservation measures may be appropriate include, but are not limited to, a higher-than-anticipated take rate, take resulting from an unexpected source within the permittee's purview, or an unanticipated significant detrimental change in the status of the local area or regional eagle population.

- Compensatory mitigation designed to replace bald and golden eagles at a 1:1 ratio would be required for take that exceeds EMU take limits. Protection of existing eagle habitat in its current state would not be accepted as compensatory mitigation for take that would exceed take thresholds because it is not additive, but habitat enhancement and restoration along with protection could be used if they can be demonstrated to increase carrying capacity in the EMU.
- Separate and distinct from compensatory mitigation to offset take above the EMU take limit, a minimum level of compensatory mitigation, preferably in the form of contribution to a third-party mitigation provider (and which could be used of habitat protection) would be required for each take permit.
- Incidental take permit application processing fees for permits less than five years would be $500. For permits five years or more, the fee would be $36,000.
- Permit administration fees for permits with a duration that exceeds five years would be increased to $15,000 every five years to support the Service's ability to conduct the five-year evaluations.

2.6 Alternative 4: Flyway EMUs, Liberal Take Levels

Eagle Management Units

The Service and its partner agencies manage for migratory birds based on specific migratory route paths within North America (Atlantic, Mississippi, Central, and Pacific). Based on those route paths, state and federal agencies developed the four administrative flyways that are used to manage migratory bird resources (Figure 2.6-1). Under this alternative, the Service would use the flyways as the EMUs for both species. For bald eagles, the Pacific flyway would be divided into three EMUs: southwest (south of 40 degrees N latitude), mid-latitude (north of 40 degrees to the Canadian border), and Alaska. For golden eagles, the Mississippi and Atlantic flyways would be combined as one EMU.

Both bald and golden eagles move over great distances seasonally and across years. There is a well-described annual seasonal migration of both species of eagles from northern regions southward in winter, a well-described annual northward migration of bald eagles from southern regions northward in summer, and a recently discovered annual northward migration of golden eagles from southern regions northward in summer. The adoption of the administrative flyways as EMUs would better address geographic patterns of risk given the aforementioned seasonal movement patterns.

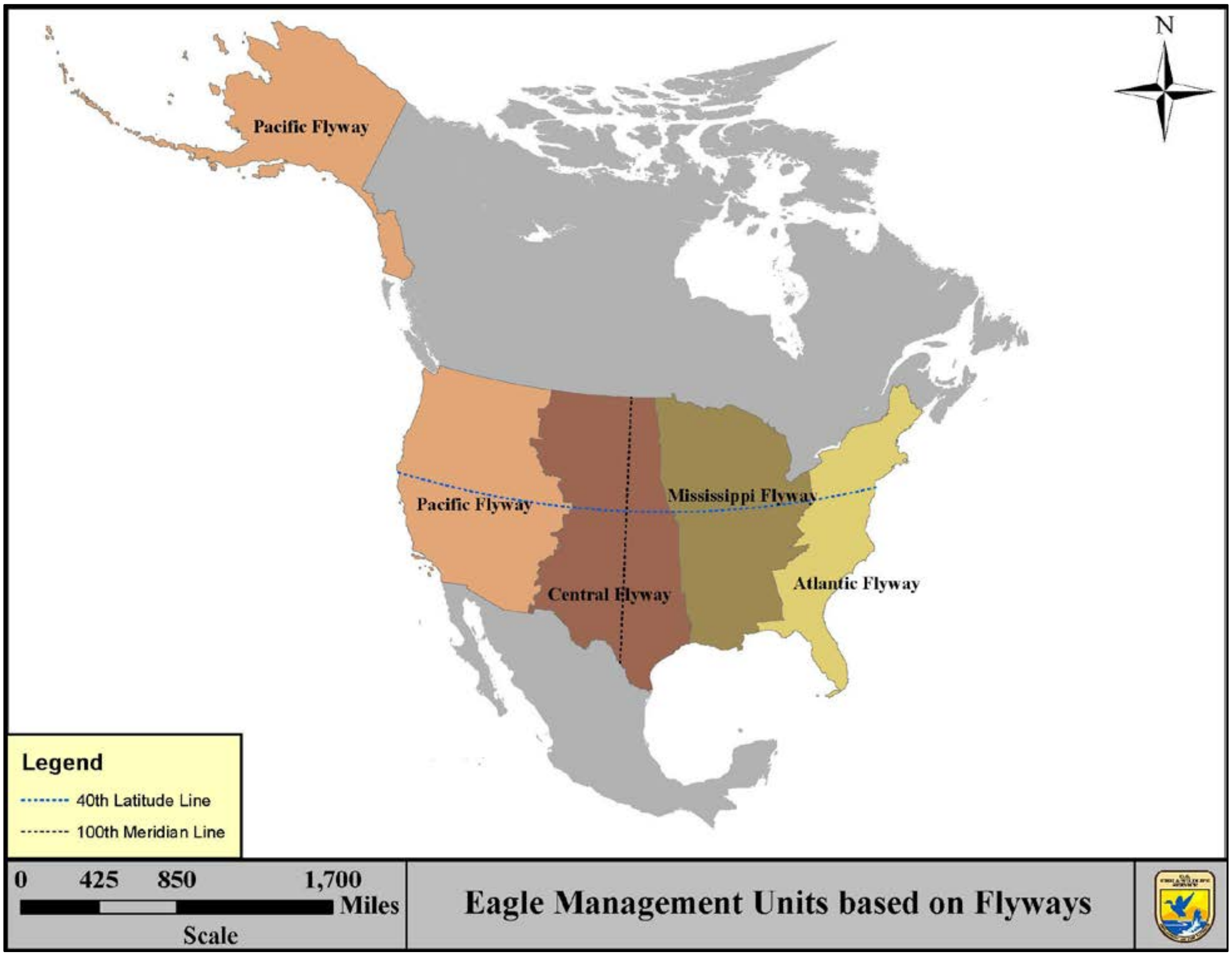


Figure 2.6-1. Flyways as EMUs for both bald and golden eagles.

Take Levels of Bald and Golden Eagles – Liberal

Take limits (for take that is not required to be offset) would be set at 0% for golden eagles and 8% of populations for bald eagles in most EMUs, with lower rates proposed in the Southwest (4.5%) and Alaska (0.7%).

Permit Regulations

The Service would make the revisions described in Management Common to All Action Alternatives and Alternative 2, plus:

- The Eagle Act's Preservation Standard (the Service's management objective) would be defined in the regulations to mean "compatible with the preservation of the bald eagle or the golden eagle means "consistent with the goal of maintaining stable or increasing breeding populations in all eagle management units, and persistence of local populations throughout the geographic range of both species." The period for modeling effects to ensure the standard is met would be 100 years (at least eight generations of eagles). The baseline population size for both species is the number of estimated eagles in 2009 populations.

- The LAP cumulative effects analysis would be incorporated into the regulations to provide protection to populations at a more local scale. Because the flyway management scale of Alternative 4 is larger than the EMUs currently in use, EMU take limits would also increase, with the result that adoption of the flyways as EMUs could be less protective of eagle populations at more local scales if most take available with a flyway was used over a small portion of the flyway. To address that possibility, and to ensure persistence of local populations, analysis of Service-authorized take within the LAP would be required. If permitting a project would result in the total amount of authorized take exceeding 5% of the estimated total local area population size, the Service would not authorize that take unless additional analysis demonstrates that permitting take over 5% of that LAP is compatible with the preservation of eagles.
- Compensatory mitigation would be required for permits that would exceed EMU take limits, some permits that exceed LAP take limits, or if otherwise necessary to maintain the persistence of local eagle populations throughout their geographic range.
- For take that exceeds EMU take limits, compensatory mitigation designed to replace bald and golden eagles at a 1:1 ratio would be required.

2.7 Alternative 5: Flyway EMUs, Conservative Take Levels, Permit Duration Increase (Preferred Alternative)

Eagle Management Units

This alternative would use the same EMUs as Alternative 4; flyways would be used as the EMU for both species. As with Alternative 4, this alternative would also include a requirement that cumulative effects of permits be analyzed at the LAP scale because the flyway management scale is larger than the current EMUs and less protective of eagle populations at more local scales.

Take Levels of Bald and Golden Eagles – Conservative

Take limits (for take that is not required to be offset) would be set at 0% for golden eagles and 6% of populations for bald eagles in most EMUs, with lower rates proposed in the Southwest (3.8%) and Alaska (0.8%).

Permit Regulations

This alternative would include the revisions described in Management Common to All Action Alternatives, plus the following revisions from Alternatives 3 and 4:

- Maximum duration of permits would be extended to 30 years. The Service would evaluate each permit at no more than five-year intervals, as described in more detail under Alternative 3.

- Incidental take permit application processing fees for permits less than five years would be $500. For permits five years or more, the fee would be $36,000.
- Permit administration fees for permits with a duration that exceeds five years would be increased to $15,000 every five years to support the Service's ability to conduct the five-year evaluations.
- The LAP cumulative effects analysis would be incorporated into the regulations (see discussion under Alternative 4).
- The Eagle Act's Preservation Standard (the Service's management objective) would be defined in the regulations to mean "compatible with the preservation of the bald eagle or the golden eagle means "consistent with the goal of maintaining stable or increasing breeding populations in all eagle management units and persistence of local populations throughout the geographic range of both species." The period for modeling effects to ensure the standard is met would remain 100 years (at least eight generations of eagles). The baseline population size for both species is the number of estimated eagles in 2009 populations.
- Compensatory mitigation would be required for permits that would exceed EMU take limits, some permits that exceed LAP take limits, or if otherwise necessary to maintain the persistence of local eagle populations throughout their geographic range.

Alternative 5 also includes the following revision to the regulations:

- For take that would exceed EMU take limits, compensatory mitigation for bald eagles would be designed to offset take at a 1:1 ratio and compensatory mitigation for golden eagles would be required at a greater than 1:1 ratio.

2.8 Alternatives Considered but Dismissed from Detailed Analysis

Qualitative Management Objective

The Service considered but did not fully analyze as part of this PEIS the adoption of a qualitative rather than quantitative approach to managing eagle populations. A qualitative approach would not involve adoption of numerical population targets; nor would it rely on limits for allowable take. An example of a qualitative management objective is the approach used in implementation of the ESA, which allows the Service to issue incidental take permits upon a finding that the taking "will not appreciably reduce the likelihood of the survival and recovery of the species in the wild" (ESA Section 10(a)(2)(B), 16 U.S. C. § 1539(a)(2)(B)).

For purposes of eagle permits, a qualitative approach could allow the Service to issue permits as long as the activity to be permitted "does not meaningfully impair the long-term stability of the breeding population." The qualitative management objective would be implemented similar to the ESA approach, with each situation evaluated in a case-by-case risk analysis. The qualitative approach could be viewed as more flexible because it does not include take limits and would allow for the possibility of unmitigated take in any population. Additional flexibility would be provided by leaving any or all of the terms "meaningfully," "impair," and "existence" undefined.

The Service considered but dismissed this approach because it concluded that a quantitative approach would be more consistent with the language of the Eagle Act than a qualitative approach, specifically, the Eagle Act's requirement that the Service not authorize take without first making a determination that the taking would meet the preservation standard. The qualitative approach would require complete, independent population assessments for each permit in order for the Service to clearly demonstrate that it had made the required affirmative determination that the take met the preservation standard, thus it could actually increase workload for each permit and would not be conducive to tiering the individual permit decisions from this PEIS. Also, the qualitative approach alone contains no standards for assessment, which could lead to inconsistent implementation between Service regions. Inconsistent implementation across regions is a bigger concern with eagles than for most ESA-listed species because the range of both bald and golden eagles extends throughout the continental U.S. Additional drawbacks to adopting a purely qualitative approach are that it is less compatible with formal adaptive management and does not provide a mechanism to assess cumulative impacts. Finally, considerable quantitative information is available on eagle populations unlike many ESA-listed species, and to ignore these data or to independently re-assess them for each permit is inconsistent with the Service's commitment to use the best available information and practice the best science.

Establishment of Specific Population Goals for Each EMU

The Service considered developing specific eagle population objectives for each EMU and then using these objectives to inform permit decisions within the EMUs. The Service dismissed this alternative as infeasible at this time given the technical and logistical complexities of working with state agencies and tribes to set populations objectives at this scale within the timeframe of this action, and the lack of fine-scale information on eagle populations that would be necessary.

Managing for Stable but Smaller Golden Eagle Populations

The Service considered allowing some take of golden eagles that would not requiring offsetting mitigation. Models show that if unmitigated take were authorized and added to existing levels of ongoing take, populations would decline but, assuming an increase in per-nest attempt productivity at lower population levels, stabilize at a lower equilibrium. The amount of decline is proportional to the rate of take as shown in Table 2.8-1. The equilibrium population size is based on the size of the predicted population at 60-100 years out (and assumes that other factors affecting populations remain unchanged).

The Service eliminated this alternative from further analysis because it is not consistent with the management objective. This alternative is inconsistent with the Service's interpretation of the Eagle Act's statutory mandate that permitting be compatible with eagle preservation because it would not "maintain" the current population even if the resulting population was stable. Also, it would likely be culturally unacceptable, particularly to Native Americans. Additionally, due to the degree of uncertainty in population estimates and the possibility that the Service might underestimate the extent to which populations may decline under an increased take rate, populations could decline to a level where they could not withstand threats, such as stochastic environmental events, climate change, drought, or resilience to a new disease or pesticide that affects the eagles or their prey base. Moreover, managing a reduction in the population that may cause the species to become listed under the ESA is not consistent with the intent of the Eagle Act.

Table 2.8-1. The golden eagle equilibrium population size and percent decline as a function of the additive take rate.

Take Rate	Equilibrium Population Size	Percent Decline
0%	26,139	15%
1%	22,728	26%
2%	19,011	39%
3%	14,582	53%
4%	10,108	67%
5%	5,963	81%
6%	3,251	89%
7%	1,598	95%
8%	721	98%
9%	316	99%
10%	135	100%

Other Permitted Take Rates

All take rates that are not part of the action alternatives were dismissed. This includes take limits that USFWS does not want to exceed and take rates that would be lower and higher, either too restrictive, or too risky. The take rates selected for analysis represent reasonable alternatives between the two extremes and are based on the best science available and taking into account the Service's management objectives for eagles.

2.9 MITIGATION

The Service defines "mitigation" to sequentially include: avoidance, minimization, rectification, reduction over time, and compensation for negative impacts. Applicants for eagle incidental take permits and eagle nest take permits must take all practicable steps to avoid and minimize take. Under the current regulations, take that "cannot practicably be avoided" can be authorized with a standard permit; however, a programmatic permit requires that the applicant reduce the potential take to the point that the only take authorized is that which is "unavoidable."

In practice, there has proved to be no clear distinction between "practicably unavoidable" and "unavoidable". The Service and applicants have struggled with how to identify and implement mitigation that exceeds what can practicably be done. For that reason, the action alternatives include revisions to the permit regulations to remove the criterion that take authorized by programmatic permits must be unavoidable, and replaces it with the requirement that take be reduced to the maximum degree practicable, the same as for standard permits.

With regard to compensatory mitigation, the 2009 regulations lack specificity as to if and when it must be required. However, compensatory mitigation was discussed in the preamble to the regulations as follows: "Additional compensatory mitigation would be required only (1) for programmatic take and other multiple take authorizations; (2) for disturbance associated with the permanent loss of a breeding territory or important traditional communal roost site; or (3) as necessary to offset impacts to the LAP. Because permitted take limits are population-based, the Service has already determined before issuing each individual take permit that the population can withstand that level of take. Therefore, compensatory mitigation for one-time, individual take permits would not typically be necessary for the preservation of eagles" (74 FR 46844).

Compensatory mitigation was also addressed in the 2009 FEA, which contained the following language: "For most individual take permits resulting in short-term disturbance, the Service would not require compensatory mitigation. The population-based permitting the Service would propose is based on the level of take that a population can withstand. Therefore, compensatory mitigation for individual permits is not necessary for the preservation of eagles. However, the Service would advocate compensatory mitigation in the cases of nest removal, disturbance or [take resulting in mortality] that would likely incur take over several seasons, result in permanent abandonment of more than a single breeding territory, have large-scale impacts, occur at multiple locations, or otherwise contribute to cumulative negative effects."

As the 2009 regulations did not incorporate specific compensatory mitigation provisions, the Service has required compensatory mitigation on a case-by-case basis somewhat inconsistently, which has resulted in disparate treatment of, and uncertainty for, permit applicants. Accordingly, all action alternatives analyzed in this PEIS include standardized requirements for compensatory mitigation. The DOI defines the term "compensatory mitigation" to mean "to compensate for remaining unavoidable impacts after all appropriate and practicable avoidance and minimization measures have been applied, by replacing or providing substitute resources or environments (See 40 C.F.R. § 1508.20) through the restoration, establishment, enhancement, or preservation of resources and their values, services, and functions." The action alternatives would all adopt this definition and approach to compensatory mitigation by incorporating by reference the Service's mitigation policy (once finalized), the Presidential Memorandum on Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment (November 3, 2015), the Secretary of the Interior's Order 3330 entitled "Improving Mitigation Policies and Practices of the Department of the Interior" (October 31, 2013), and the Departmental Manual Chapter (600 DM 6) on Implementing Mitigation at the Landscape-scale (October 23, 2015).

Since 2009, take limits for golden eagles have been set at 0% throughout the United States, unless offset. Accordingly, in order to meet eagle preservation goals and because all permits for golden eagle take would exceed the take limits, permits must incorporate offsetting compensatory mitigation after all appropriate and practicable avoidance and minimization measures are employed.

In every alternative analyzed in this PEIS, including the No Action alternative, compensatory mitigation would continue to be required whenever take would otherwise exceed established take limits. For eagle permits authorizing take that would exceed EMU take limits, compensatory mitigation must consist of actions that either reduce another ongoing form of mortality to a level equal to or greater than the unavoidable mortality, or lead to an increase in carrying capacity that allows the eagle population to grow by an equal or greater amount. In these situations, new authorized “take” of golden eagles must be at least equally offset by specific conservation actions to replace or offset project-induced losses. For example, if, under an eagle incidental take permit, a project is expected to take an average of three eagles over a five-year period, the permittee must provide compensatory mitigation that prevents three eagles from being taken by another pre-existing source of mortality within the EMU. Take would have to be compensated for within the same EMU as the take, except in cases where it is biologically justifiable to do otherwise. Thus, because a substantial proportion of the mortality of golden eagles originating in Alaska occurs on migration or during winter in the interior western coterminous U.S. and north-central Mexico, effective mitigation for take of Alaskan golden eagles could occur in these areas as well.

Under Alternative 2, compensatory mitigation would be limited to permits that would exceed EMU take limits, and would be designed to offset take at a one to one ratio. Under Alternative 3, Compensatory mitigation designed to replace bald and golden eagles at a 1:1 ratio would be required for take that exceeds EMU take limits. For take that exceeds EMU take limits, compensatory mitigation designed to replace bald and golden eagles at a 1:1 ratio would be required. Protection of existing eagle habitat in its current state would not be accepted as compensatory mitigation for take that would exceed take thresholds because it is not additive, but habitat enhancement and restoration along with protection could be used if they can be demonstrated to increase carrying capacity in the EMU.

Under Alternative 3, separate and distinct from compensatory mitigation to offset take that would exceed EMU take limits, a minimum level of compensatory mitigation, designed to address the incremental effects of authorized take, and preferably in the form of contribution to a third-party mitigation provider (and which could be used of habitat protection) would be required for each take permit.

Under Alternatives 4 and 5, compensatory mitigation may be required for permits that would authorize take above the 5% LAP limit, and Alternatives 4 and 5 also provide the Service flexibility to require compensatory mitigation even when the permitted take is within EMU and LAP take limits if necessary to maintain the persistence of local eagle populations throughout their geographic range. Under Alternatives 2 and 3, compensatory mitigation would be limited to permits that would exceed EMU take limits and some permits that exceed LAP take limits. That level of compensatory mitigation would meet the requirement that permitted take be compatible with the preservation of eagles.

The Service will encourage the use of in-lieu fee programs, mitigation and/or conservation banks, and other established mitigation programs and projects. The Service intends to facilitate the establishment of one or more in-lieu fee program(s) to allow permit applicants to contribute to a compensatory mitigation fund as an alternative to developing individual mitigation measures for each project. All compensatory mitigation would be required to adhere to the same principles and equivalent and effective standards as outlined in Service, Departmental, and Presidential mitigation policies. These include: science-based reliable and consistent metrics; additional mitigation measures above baseline conditions; and durable mitigation measures for at least the duration of the project impacts. Predictions about the effectiveness of compensatory mitigation measures have varying degrees of uncertainty. Under the current framework, the Service has required a relatively high degree of confidence in the effectiveness of compensatory mitigation, which has limited available options. Under all action alternatives, the Service would allow compensatory mitigation measures and programs that face more risk and uncertainty provided mitigation accounting systems factor in risk and adjust metrics, mitigation ratios, and the amount of required mitigation to account for uncertainty.

Available information suggests that ongoing levels of human-caused mortality of golden eagles likely exceed sustainable take rates, potentially substantially. As a result, in Alternative 5, the preferred alternative, compensatory mitigation for any authorized take of golden eagles that exceeds take limits would be designed to ensure that take is offset, and additional conservation benefits accrue such that the overall benefits exceed simply offsetting the added impact of the permitted take.

2.10 Comparison of Alternatives

Four reasonable alternatives, in addition to the No Action alternative, were developed. Table 2.10-1 compares and contrasts the alternatives, including how each alternative accomplishes the purpose or fulfills the project objectives identified in *Section 1.3, Purpose and Need*. Alternative 5 is the Preferred Alternative.

Table 2.10-2 compares the potential environmental impacts resulting from the alternatives. Potential impacts are provided according to environmental resource topic. *Chapter 3, Affected Environment and Environmental Consequences,* of this PEIS contains a detailed discussion of these potential impacts by resource topic.

Table 2.10-1. Alternatives comparison table.

Component	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
Preservation Standard	"Consistent with the goal of maintaining stable or increasing breeding populations."	Same as Alternative 1	Same as Alternative 1	"Consistent with the goals of maintaining stable or increasing breeding populations in all eagle management units, and persistence of local populations throughout the geographic range of both species."	Same as Alternative 4
EMU	Bald eagle: based on Service Regions Golden eagle: Bird Conservation Regions west of the 100th meridian	Bald eagle: based on Service Regions Golden eagle: Bird Conservation Regions west of the 100th meridian; east of 100th meridian combined into one EMU	Same as Alternative 2	Bald eagle: Flyways (Pacific flyway divided into three EMUs: southwest, mid-latitude, and Alaska) Golden eagle: Flyways (Mississippi and Atlantic flyways combined as one EMU)	Same as Alternative 4
EMU Take Level (take limit without mandatory offsetting compensatory mitigation)	Bald eagle: 5% of estimated annual productivity Golden eagle: 0%	Bald eagle: 8% of population; 4.5% (Southwest); 0.7% (Alaska) Golden eagle: 0% unless offset	Bald eagle: 6% of population; 3.8% (Southwest); 0.8% (Alaska) Golden eagle: 0% unless offset	Same as Alternative 2	Same as Alternative 3
LAP Analysis	Remains guidance	Same as Alternative 1	Same as Alternative 1	LAP cumulative effects analysis is incorporated into the regulations. Analysis of Service-	Same as Alternative 4

Component	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
				authorized take within the LAP required and not authorized if it would exceed 5% of the estimated total local area population size unless additional analysis is conducted and demonstrates that permitting take over 5% of that LAP is compatible with the preservation of eagles.	
Permit Types	Two types: Standard and Programmatic	No distinction between different types of incidental take permits	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Permit Duration - §22.26	Up to five years	Same as Alternative 1	Up to 30 years with mandatory re-assessments at ≤ 5 year checkpoints	Same as Alternative 1	Same as Alternative 3
Mitigation (Applies to both §22.26 and §22.27 unless noted)	Avoidance and minimization: for standard permits, must be practicable. For programmatic permits, must reduce take to unavoidable. Offsetting mitigation required to replace bald and golden eagles at a 1:1 ratio whenever	Avoidance and minimization to the maximum degree practicable for all permits (no distinction between standard and programmatic permits). All compensatory mitigation is offsetting mitigation. Compensatory	Avoidance and minimization to the maximum degree practicable for all permits (no distinction between standard and programmatic permits). Compensatory mitigation designed to offset impacts at a 1:1	Same as Alternative 2, plus: Compensatory mitigation would be required if needed to ensure the long-term persistence of local populations throughout the species' range, including if necessary to issue permits that would	Same as Alternatives 3 and 4, except: Compensatory mitigation to be assessed at a greater than 1:1 ratio for golden eagles.

Component	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
	take would exceed the current EMU take limits. Compensatory mitigation is not standardized and could be required for take that is within EMU take limits. Removal of eagle nests other than for safety emergencies, health or safety, or to restore the use of a man-made structure, the activity, or the mitigation for the activity, must provide a net benefit to eagles.	mitigation is limited to take that would exceed EMU take limits. Compensatory mitigation is designed to offset take for bald and golden eagles at a 1:1 ratio. Removal of eagle nests other than for safety emergencies, health or safety, or to restore the use of a man-made structure, the activity, or the mitigation for the activity, must provide a net benefit to eagles. Establishment and promotion of mitigation banks could allow for greater benefits than Alternative 1, dollar for dollar, because funds would be leveraged and targeted where most needed.	ratio would be required for any permitted take that exceeds EMU take limits. Separate and distinct from compensatory mitigation to offset take above the EMU take limit, Alternative 3 would require a minimum level of compensatory mitigation, preferably in the form of contribution to a third-party mitigation provider (and which could be used of habitat protection) is required for each take permit. Additional reasonable and practicable avoidance and minimization may be required for long-term permits at 5-year evaluations. Compensatory mitigation for long-term permits would be adjusted up or down based on updated	exceed the LAP take limit. Compensatory mitigation other than for take that exceeds EMU take limits could consist of habitat protection.	

Component	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
			fatality predictions and applied going forward at 5-year evaluations. Removal of eagle nests other than for safety emergencies, health or safety, or to restore the use of a man-made structure, the activity, or the mitigation for the activity, must provide a net benefit to eagles.		
Service-approved Survey Protocols - §22.26	Not required by regulations.	Service-approved survey protocols required by regulations.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Administration Fee - §22.26	N/A	N/A	Administration fee of $15,000 every five years.	N/A	Administration fee of $15,000 every five years.
Application Processing Fee - §22.26	Standard: $500 Programmatic five-year: $36,000	Less than five years—Homeowner: $500 Less than five years—Commercial: $2,500 Five years or more: $36,000	Same as Alternative 2	Same as Alternative 2	Same as Alternative 3
Eagle Nest Take Permits	Removal of eagle nests where (1) necessary to alleviate a safety emergency to people or eagles, (2)	Requirement removed that suitable habitat be available for non-emergency nest take.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2

Component	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
	necessary to ensure public health and safety, (3) the nest prevents the use of a human-engineered structure, or (4) the activity, or mitigation for the activity, will provide a net benefit to eagles. Only inactive nests may be taken except in the case of safety emergencies.	Waiver for the transport of nestlings and viable eggs to a foster nest or rehabilitator requirement. Allows for removal of in-use nests to prevent an advancing safety emergency that is likely to fully develop while the nest is still in use. Allow removal of an alternate nest or an in-use nest prior to egg-laying that would lead to a structure becoming inoperable. Application Processing Fee for commercial entities would increase to $2,500, and for multiple nests, $5,000			
Definitions	Definitions for “ACP”, “Area Nest Population”, “Eagle Nest”, “Inactive nest”, “Maximum Degree Achievable”, “Programmatic Take”, “Programmatic Take	Definitions revised for “Eagle Nest” and “Practicable”. New definitions: “Alternate Nest”, “Eagle Management Unit”, “In-use Nest”, and “Nesting	Same as Alternative 2.	Same as Alternative 2 plus: New definition: “Compatible with the Preservation of the bald eagle or the golden eagle”.	Same as Alternative 4.

Component	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
	Permit" and "Territory" remain the same. No new definitions for "Alternate Nest", "Nesting Territory", and "Occupied Nest".	Territory". Definitions of "Inactive Nest", "Advanced Conservation Practices", "Area Nesting Population", "Maximum Degree Achievable", "Territory", "Programmatic Take", and "Programmatic Take Permit" removed.			

Table 2.10-2. Summary comparison of environmental consequences.

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
Bald Eagle	The No Action would be consistent with the goal of maintaining the potential for stable or increasing breeding populations over 100 years. Impacts on eagle populations would be direct and indirect, long-term likely lasting decades. The magnitude of beneficial impacts on bald eagle populations would be moderate to major throughout the U.S. Populations in all EMUs would continue to recover and rebound toward their theoretical carrying capacity. Equilibrium population after 100 years would likely fall somewhat short of the theoretical nationwide carrying capacity that would be possible in the absence	All else remaining unchanged, take rates under Alternative 2 balance the risk from uncertainty in population size and demographic rate estimates equally between the possibility of over-regulating take versus under-protecting eagles. Effects on bald eagle populations could be either beneficial or adverse. Eliminating the “unavoidable standard” in lieu of maximum degree practicable” will encourage more applicants and thus result in conversion of unauthorized take to authorized take, thereby increasing conservation measures for eagles. Magnitude of impacts could range from	All else remaining unchanged, take rates under Alternative 3 distribute risk from uncertainty in population size and demographic rate estimates in roughly an 80:20 ratio towards being more protective of bald eagles than may be necessary to foster stable or growing populations, with an increased risk of over-regulating activities that seek eagle take permits. This alternative would also require a minimum level of compensatory mitigation for every take permit, resulting in more benefits to bald eagles from compensatory mitigation than the other alternatives. Magnitude of impacts could range from minor to moderately beneficial. More likely	All else remaining unchanged, take rates under Alternative 3 balance the risk from uncertainty in population size and demographic rate estimates equally between the possibility of over-regulating take versus under-protecting eagles. The use of flyway EMUs would more accurately reflect eagle movement patterns and better protect non-breeding eagles. The modified Preservation Standard, LAP analysis, and ability to secure compensatory mitigation where needed to ensure the persistence of local populations provide greater benefits to bald eagles than Alternatives 2, and 3. Eliminating the	Overall impacts would be similar to Alternatives 3 and 4: The impact of take levels, and extending the maximum permit duration would have the same effects as Alternative 3. The impacts of using the flyway EMUs, the modified Preservation Standard, LAP analysis, and ability to secure compensatory mitigation where needed to ensure the persistence of local populations would be the same as Alternative 4. Eliminating the “unavoidable standard” in lieu of maximum degree practicable” will encourage more applicants and thus result in conversion of unauthorized take to authorized take,

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
	of high levels of unauthorized anthropogenic mortality. The No Action alternative would not resolve the problem of unpermitted, unauthorized take and relatively high overall levels of anthropogenic mortality.	potentially negligible to minor adverse to potentially minor and beneficial. There could be a lower equilibrium population in the long term than under the No Action alternative because take rates are higher under this alternative.	to be minor to moderately beneficial. Eliminating the “unavoidable standard” in lieu of maximum degree practicable” will encourage more applicants and thus result in conversion of unauthorized take to authorized take, thereby increasing conservation measures for eagles. The long-term equilibrium population would likely be comparable to that in the No Action alternative. Extending maximum permit duration to 30 years may increase participation in permit program and the implementation of eagle conservation measures and compensatory mitigation.	“unavoidable standard” in lieu of maximum degree practicable” will encourage more applicants and thus result in conversion of unauthorized take to authorized take, thereby increasing conservation measures for eagles.	thereby increasing conservation measures for eagles. Overall, this Alternative is likely to have beneficial impacts to bald eagles comparable to Alternative 1.
Golden Eagle	The No Action	Overall impacts would	A minimum level of	Alternative 4 would	Alternative 5 would

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
	alternative would not resolve the problem of unpermitted, unauthorized take and relatively high overall levels of anthropogenic mortality. Future golden eagle populations would potentially trend downward toward a lower population size not only well below the estimated theoretical carrying capacity for the U.S. but also potentially below the 2009 population, falling short of providing for a stable or increasing U.S. golden eagle population. Impacts on eagle populations would be direct and indirect, long-term likely lasting a decade or longer. Magnitude of the adverse impacts on golden eagle populations would be moderate throughout	be very similar to the No Action alternative. Unlike the No Action alternative, compensatory mitigation would not be limited to actions that have been fully analyzed and metrics to adjust for risk would be applied. Compensatory mitigation could consist of a variety of measures under this alternative, so long as they were expected to fully offset the effects of added mortality via permits. Eliminating the “unavoidable standard” in lieu of maximum degree practicable” will encourage more applicants and thus result in conversion of unauthorized take to authorized take, thereby increasing conservation measures for eagles. Establishment and promotion of mitigation	compensatory mitigation over and above the offsetting mitigation needed to replace eagles taken under permits would be required for every take permit, resulting in more benefits to golden eagles from compensatory mitigation than the other alternatives. Extending the maximum permit duration to 30 years would likely increase participation in permit program and thus use of eagle conservation measures and mitigation. Eliminating the “unavoidable standard” in lieu of maximum degree practicable” will encourage more applicants and thus result in conversion of unauthorized take to authorized take, thereby increasing conservation measures	likely still not resolve the problem of unpermitted take and relatively high overall levels of anthropogenic mortality. The modified Preservation Standard and requirement for the LAP analysis would reduce the possibility of significant declines in local populations. Use of flyway EMUs and the cumulative LAP analysis would facilitate more accurate and precise management at the local level. Eliminating the “unavoidable standard” in lieu of maximum degree practicable” will encourage more applicants and thus result in conversion of unauthorized take to authorized take, thereby increasing conservation measures for eagles.	address in two ways the problem of unpermitted take and relatively high overall levels of anthropogenic mortality: Longer permit duration should have the effect of converting unauthorized take to authorized take accompanied by compensatory mitigation. Offsetting mitigation ratio would be greater than 1:1. Use of flyway-based EMUs would more accurately reflect eagle movement patterns and better protect non-breeding eagles. The modified Preservation Standard and codification of the LAP analysis would add protection for populations on the local scale. Eliminating the

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
	the U.S.	banks could potentially allow for greater benefits than under the No Action because funds would be leveraged and targeted where most needed. The No Action alternative would not resolve the problem of unpermitted, unauthorized take and relatively high overall levels of anthropogenic mortality.	for eagles.		"unavoidable standard" in lieu of maximum degree practicable" will encourage more applicants and thus result in conversion of unauthorized take to authorized take, thereby increasing conservation measures for eagles. Like Alternative 4, extending maximum permit duration to 30 years would likely increase participation in permit program and thus use of eagle conservation measures and mitigation. Overall effects on golden eagle numbers would be minor to moderately beneficial because it might arrest or reverse the projected decline in the nationwide golden eagle population.
Eagle Habitat	There would be no	There would be no	There would be	Impacts would be	Additional beneficial

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
	direct adverse impacts to eagle habitat from the continued implementation of authorized take of eagles. There would be negligible to major indirect adverse impacts from potential loss, alteration, and fragmentation of habitat, and reduced habitat values and suitability during implementation of permitted projects. Golden eagle habitat in the East would continue to be adversely impacted by unauthorized projects. Because compensatory mitigation for bald eagles would continue to be applied in many cases for take within take limits, the beneficial effects on habitat would vary from moderate to major.	direct adverse impacts to eagle habitat from the implementation of revised authorized take of eagles. Limiting compensatory mitigation to take that above EMU take limits would reduce the level of habitat protection for eagles compared to the other alternatives. Take of golden eagles in the East would be authorized, resulting in a modest reduction of adverse impacts and a minor increase in beneficial effects on golden eagle habitat. Greater conversion of unauthorized take to authorized take than Alternative 1 would moderately reduce adverse impacts on eagle habitat.	moderate to major beneficial habitat impacts from compensatory mitigation under Alternative 3. Take of golden eagles in the East would be authorized, resulting in a modest reduction of adverse impacts and introduction of a moderate increase in beneficial effects on golden eagle habitat from mitigation. Long-term permits would likely increase compliance and permit coverage, resulting in a modest increase in habitat protection that would be secured by requiring compensatory mitigation for every permit. Alternatives 3 and 5 are likely to have the most beneficial impacts to golden eagle habitat. Alternative 3 is likely to	similar to Alternative 2; additionally: The modified Preservation Standard and codified LAP analysis in Alternative 4 includes an added level of protection for eagles and habitat at the local scale. Compensatory mitigation could be required if warranted to maintain the persistence of local populations, and it could be in the form of habitat protection and/or enhancement, providing greater benefits to eagle habitat.	effects would occur to golden eagle habitat by increasing the compensatory mitigation ratio to greater than 1:1. Combining the LAP analysis with conservative take levels in this alternative would reduce adverse impacts on eagle habitat more than when the LAP analysis is combined with liberal take levels as in Alternative 4. Alternatives 5 and 3 are likely to have the most beneficial impacts to golden eagle habitat.

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
			have the most beneficial impacts to bald eagle habitat.		
Migratory Birds	There would be no direct adverse impacts to migratory birds from the continued implementation of authorized take of eagles. There would be negligible to moderate indirect adverse impacts to migratory birds and habitat due to possible take of birds during implementation of permitted projects and from potential habitat loss and alteration. Compensatory mitigation conducted for eagles could have both adverse and beneficial negligible to moderate effects on migratory birds, depending on the species, but is likely to be significantly more beneficial than adverse	There would be no direct adverse impacts to migratory birds from the implementation of revised authorized take of eagles. There would be negligible to moderate indirect adverse impacts to migratory birds and habitat due to possible take of birds during implementation of permitted projects and from potential habitat loss and alteration. Compensatory mitigation could have beneficial or adverse minor to moderate impacts on migratory birds, depending on the species.	There would be moderate to major beneficial impacts to migratory birds from the increased compensatory mitigation requirements. There would likely be more overall beneficial or adverse impacts (depending on the species of migratory bird) in this alternative because of the increased compliance and conservation measures expected from extending the maximum permit duration. Thus, the beneficial or adverse effects of compensatory mitigation on migratory birds would likely be greater overall under Alternative 3 than under Alternative 2.	Impacts would be similar to Alternative 2; additionally: The application of compensatory mitigation in flyway EMUs would not affect migratory birds in the local project area in many cases, but rather at some distance away.	The effects under Alternative 5 would include some from Alternative 3 and some from Alternative 4. The effects of more conservative take limits and extending the maximum permit duration would be the same as in Alternative 3. Effects of adopting flyway EMUs rather than the current EMUs, the modification of the definition of the Eagle Act preservation standard and, the incorporation of the LAP analysis would be the same as in Alternative 4. The overall beneficial or adverse effects of compensatory mitigation on local populations of migratory birds would

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
	overall.				likely be greater under Alternative 5 than under Alternative 4 due to greater participation in the permit program that would result from extending the maximum permit duration to more closely align with the duration of long-term projects and the associated conservation measures that would thereby be secured.
Other Permitted Take	No impacts anticipated.	Bald eagle: Proposed limit is unlikely to cause any change in the number of permits issued for other permitted take. Golden eagle: Given that the recent take history is lower than the baseline, it does not appear that the take limit would impact the number of eagle permits granted for other permitted take overall. However, if the	Similar impacts to Alternative 2 except: Long-term benefits to eagles expected from this alternative could allow for increased unmitigated take opportunities for under other permit types. If the addition of longer-term permits “locks in” a higher level of annual demand to be met from a relatively fixed supply of available permits (at	Same impacts from take levels as in Alternative 2; no impacts anticipated from use of flyway EMUs as management units.	Long-term benefits to eagles expected from this alternative could allow for increased unmitigated take opportunities for under other permit types. No impacts anticipated from use of flyway EMUs as management units. The application of LAP analysis is not likely to impact other permitted take.

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
		Service determines the permitted activity would take eagles with an effect on the population, the permit could be subject to the annual permit limits. Under the change proposed to 50 CFR, 22.27, it could lead to increase in nest permits, potentially crowding out 22.25 permits, leading to minor impact, at most.	the limit level), this could affect the number of permits that are available for other permitted take, especially if other permitted take approached the baseline. This is not likely; however, as there is no indication that demand for other permitted take would rise over baseline in the foreseeable future.		Same impacts from 30-year permit duration as Alternative 3.
Cultural and Religious Issues	Potential adverse impacts to tribes east of the 100th meridian if unable to obtain EAIRT permit. Issuance of take permit for any purpose would cause adverse impacts to some tribes and conservationists, etc.	Minor beneficial impacts could occur to tribes east of the 100th meridian requesting EAIRT permits. Higher levels of unmitigated take of bald eagles would cause minor adverse impacts to some tribes and conservationists, or anyone who might perceive increased take rates of the bald eagle as compromising the nation's symbol.	Minor beneficial impacts to tribes east of the 100th meridian requesting EAIRT permits. 30-year take permit would likely result in more conversion of unauthorized take to authorized take requiring consideration of TCPs under Section 106 of the NHPA and minimizing impacts to them. Increased issuance of	Minor beneficial impacts to tribes east of the 100th meridian requesting EAIRT permits. The modified preservation standard and codification of the LAP analysis would better protect eagles at a more local scale, benefitting tribes that value the presence of wild eagles. Higher levels of unmitigated take of	Similar impacts as Alternatives 3 and 4, except: Compensatory mitigation would not be required for every permit. However, compensatory mitigation for take that would exceed EMU take limits at a greater than 1:1 ratio would have conservation benefits for golden eagles in all flyway EMUs; most potential benefits to tribal cultural values in

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
			take permits could cause minor adverse impacts to some tribes that place significant cultural value on the well-being of wild eagles. A modestly increased supply of eagle remains from incidental take permittees at the National Eagle Repository could reduce wait times, providing minor beneficial effects to tribal members.	bald eagles could cause minor adverse impacts to tribal members who perceive increased take rates as culturally unacceptable. Flyway EMUs would better enable the Service to achieve management objectives with associated benefits to those who culturally value eagles.	the long-term.
Socioeconomic Resources	Minor adverse impacts to developers east of the 100th meridian unable to request permits and due to federal punishment. Financial risk and cost of criminal prosecution would be significant in the short- and long-term. There would be moderate beneficial effects to recreational	Beneficial impacts to developers east of the 100th meridian able to request permits. More streamlined permitting process and standardized compensatory mitigation would benefit developers by reducing uncertainties and delays in permit processing. Higher unmitigated take	Beneficial impacts to developers east of the 100th meridian able to request permits. More streamlined permitting process and standardized compensatory mitigation would benefit developers by reducing uncertainties and delays in permit processing. However, the minimum	Same as Alternative 2, additionally: Similar effects as Alternative 2, except: Codification of LAP analysis into regulations along with the modified preservation standard could result in increased compensatory mitigation requirements for some permittees; minor and	Same as Alternative 3, additionally: Minor adverse impacts to some smaller wind project could be significant due to compensatory mitigation requirements at a ratio greater than 1:1. Codification of LAP analysis into regulations along with the modified preservation standard

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
	and aesthetic values from the compensatory mitigation that may be required for any bald eagle take permit, including habitat – based compensatory mitigation. Moderate adverse impacts to recreational and aesthetic values with regard to golden eagles because the high level of golden eagle mortality from unauthorized take of golden eagles would not be addressed. Minor adverse impacts since unknown costs of compensatory mitigation and other uncertainties can dissuade investors.	levels for bald eagles would cause minor adverse impacts to recreational and aesthetic values associated with eagles due to the perception that bald eagle population would decline.	level of compensatory mitigation that would be required for every incidental take permit would have minor adverse effects to small entities. Permit duration of up to 30 years would benefit developers of long-term projects with regard to project finance agreements and contracts. Though lower than Alternative 2, increased unmitigated take levels for bald eagles would cause minor adverse impacts to recreational and aesthetic values associated with eagles due to the perception that bald eagle population would decline. Increased permit coverage and the associated conservation measures, plus the minimum level of compensatory	adverse to most, but could be moderate for smaller entities.	could result in increased compensatory mitigation requirements for some permittees; minor and adverse to most, but could be significant to smaller entities. Long-term beneficial effects to eagles from increased mitigation requirements for golden eagle take permits; added protection of populations at the local scale; and increased permit coverage and associated conservation measures resulting from availability of long-term permits would have moderate to major beneficial impacts to those who value eagles and eagle habitat aesthetically and recreationally.

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
			mitigation that would be required for every permit, including habitat-based mitigation, would provide moderate benefits to recreational and aesthetic values.		
Climate Change	None of the alternatives would directly produce emissions or emissions reductions, so there would be no direct impacts to climate change. There would be no change in the number or type of projects from current practice, thus no indirect impacts on climate change would result.	If the number of wind projects is the same as it would have been without the new permit regulations, then the impact of the regulations on climate change would be negligible, although the impact of increasing wind energy development would be positive as the volume of GHG emissions replaced by new wind energy grows over time. If the volume of development *increases* over what it would have been without the new permit regulations, then the increased amount of fossil fuel emissions	Same impacts as Alternative 2. In addition, if the 30-year permit duration leads to more permit requests, the benefits from avoided GHG emissions would proportionally grow, though still remain minor in the global context.	Same impacts as Alternative 2.	Same impacts as Alternative 3.

Impact Topic	Alternative 1: No Action	Alternative 2: Current EMUs, Liberal Take	Alternative 3: Current EMUs, Conservative Take	Alternative 4: Flyway EMUs, Liberal Take	Alternative 5: Flyway EMUs, Conservative Take (Preferred Alternative)
		that are replaced by wind energy production could provide a more beneficial impact from the proposed action, although in the context of planetary emissions the impact on climate change would still be minor.			

Chapter 3: Affected Environment and Environmental Consequences

This chapter describes the affected environment and potential environmental effects associated with the No Action alternative and the actions considered as part of the four action alternatives. Following the description of the affected environment, this section presents analysis of the direct and indirect effects to the environment that may occur as a result of implementing the alternatives.

3.1 Methodology

For each resource topic, the effects of the actions in each alternative are analyzed. The effects to the resources are analyzed on the basis of type, duration, extent, and magnitude of the impacts. The following general definitions were used to evaluate impacts associated with project alternatives.

Types of Impact

- Beneficial – A positive change in the condition of the resource or a change that moves the resource toward a desired condition. An impact could also be beneficial if it contributes towards meeting the objectives of bald and golden eagle management.
- Adverse – A change that moves the resource away from a desired condition or detracts from its condition. An impact could also be adverse if it detracts from meeting the objectives of bald and golden eagle management.
- Direct – An effect that is caused by an action and occurs in the same time and place.
- Indirect – An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.

Duration of Impact

NEPA analyses usually express impacts in terms of duration, such as long-term, short-term, and temporary. Long-term impacts would last for the duration of the eagle rule revision or until that time when the rule is revised again. Short-term impacts would extend beyond the time of project activities, but would not last more than a few years.

Extent of Impact

Context is the setting within which an impact is analyzed. For this eagle rule revision, most impacts are analyzed in the context of a nationwide setting. However, local impacts may occur in an LAP area or in those instances that affect the resource only on the project site or its immediate surroundings.

Magnitude of Impact

Impact intensity is the degree to which a resource would be beneficially or adversely affected by the action.

- Negligible – Minimal impact on the resource would occur; any change that might occur would be barely perceptible and not be easily measurable.
- Minor – Change in a resource would occur, but no substantial resource impact would result; the change in the resource would be detectable but would not alter the condition of the resource.
- Moderate – Noticeable change in a resource would occur and this change would alter the condition of the resource, but the integrity of the resource would remain intact.
- Major – Substantial impact or change in a resource area would occur that is easily defined and highly noticeable and that measurably alters the condition of the resource; the integrity of the resource may not remain intact.

3.2 BALD EAGLE

3.2.1 Affected Environment

3.2.1.1 General Conditions

The bald eagle (*Haliaeetus leucocephalus*) is a member of the sea eagle genus that is endemic to North America, breeding from Canada to northern Mexico (Buehler 2000; Figure 3.2-1). Bald eagles exhibit delayed reproduction, and go through a series of plumages before attaining the white head and tail of the definitive plumage at 5 years of age (Clark and Wheeler, 1983; Fig. 3.3-2). Bald eagles are large birds, weighing up to 11. 5 lbs.; females are larger than males and overall size decreases from north to south across the species' range (Buehler, 2000).

Bald eagles may travel great distances during dispersal and migration (Buehler, 2000; Mojica et al. 2008) but usually return to within 45 miles of their natal area to breed (Millsap et al., 2015). Breeding bald eagles occupy territories, which are typically occupied continuously for many years (Buehler, 2000; Fig. 3.2-3). Bald eagle nesting territories usually contain many alternative nest sites, only a single one of which is normally used in any given year (Buehler, 2000, Watts, 2015). Breeding begins in Florida as early as October, and as late as April or May in northern parts of the (USFWS, 2009a).

Bald eagles typically lay one to three eggs once per nesting season, and productivity averages about 1.12 young per occupied nesting territory, except in the Southwestern U.S. where productivity averages 0.73 young fledged per occupied nesting territory (USFWS, 2016). The eggs hatch after about 35 days of incubation, and young leave the nest at 10 to 12 weeks after hatching (Buehler 2000). Young birds usually remain in the vicinity of the nest for about six weeks, over which time they are almost completely dependent upon their parents for food (Wood and Collopy, 1998; Millsap et al., 2004).

Outside the breeding season bald eagles often gather in large, communal roosts near good foraging areas (Platt, 1976; Mojica et al., 2008; Fig. 3.3-4). There is a high degree of fidelity to migratory routes, stopover sites, and roosts (Mojica et al., 2008). Recent studies show that bald eagles use networks of communal roosts located strategically in association with foraging areas, and that individuals may move daily between regional roosts (Watts and Mojica, 2015).

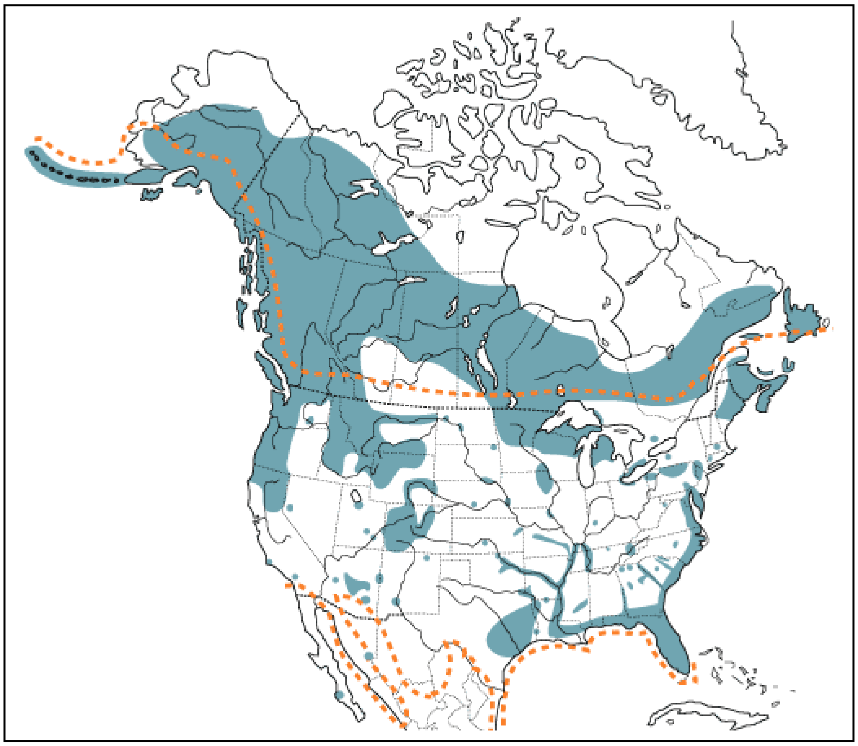


Figure 3.2-1. Range of the bald eagle in North America (Buehler, 2002).

Figure 3.2-2. Adult bald eagle (*Haliaeetus leucocephalus*).

Bald eagles are opportunistic feeders, focusing on fish and aquatic prey primarily, but also feeding heavily on waterfowl, wading birds, small mammals, turtles, and carrion, including refuse at landfills (Buehler 2002, Mojica et al. 2008).

For a discussion of bald eagle habitat, and effects of the alternatives on habitat, see *Section 3.4*.

Figure 3.2-3. Bald eagle pair on nest.

Figure 3.2-4. Thousands of bald eagles congregate on Alaska's Chilkat river.

3.2.1.2 Population

Introduction

Bald eagles are thought to have declined with the loss of habitat and persecution associated with early European settlement in North America, but there is little data to support that conjecture. However, in 1940, recognizing the accumulating threats to bald eagles, Congress enacted the Bald Eagle Protection Act, which was amended in 1962 to become the Bald and Golden Eagle Protection Act with the addition of protection for the golden eagle (Millsap et al., 2007).

A class of organochlorine insecticide compounds including DDT (dichloro-diphenyl-trichloroethane), dieldrin, endrin, aldrin, and heptachlor, were introduced in the 1940's. DDT and relatives were used extensively and in large quantities to control mosquitoes and other insect pests (Newton, 1998). DDT and its breakdown products are persistent organic chemicals that are not easily or quickly broken down or decomposed into non-toxic substances by natural processes (Newton, 1998). These persistent pesticides bioaccumulated in aquatic and avian food chains, reaching their highest levels in predators at the tops of these food chains like bald eagles, ospreys (*Pandion haliaetus*), and peregrine falcons (*Falco peregrinus*) (Nisbit, 1989; Kauffman et al., 2004; Bretagnolle et al. 2008). The main effect these pesticides and their metabolites had on raptors was to inhibit the eggshell formation process, which led to eggs with abnormally thin shells that failed to hatch, together with increased mortality (Nisbit, 1989; Bowerman et al., 1995; Grier, 1982). Together, these factors led to a substantial decline in bald eagle populations throughout the coterminous U.S. in the mid-1900's, with lowest populations observed in the 1960's (Buehler, 2000)

This decline resulted in the bald eagle being listed under the Endangered Species Conservation Act in 1967 and later under the Endangered Species Act as threatened or endangered everywhere in the U.S. except Alaska (Millsap et al., 2007; 43 FR 6230, Feb. 14, 1978). In the four decades since registration of DDT was cancelled by EPA in 1972, bald eagle numbers have rebounded (Buehler, 2000). By 1999, the Service proposed to remove the bald eagle from the list of threatened and endangered species, and in July 2007, the Service completed that action (*Federal Register* 72:37346-37372). Delisting in the Sonoran Desert region was enjoined by the Federal District Court for the District of Arizona in response to *Ctr. for Biological Diversity v. Kempthorne*, No. 07-0038-PHX-MHM (D. Ariz. Mar. 6, 2008). However, in September 2011 the Service published a final rule delisting the bald eagle in the Sonoran Desert region (76 FR 54711, Sept. 2, 2011).

Bald eagles are listed as a Bird of Conservation Concern (BCC) by the Service because of their recent Endangered Species Act delisted status (USFWS, 2008a). They were included on 29 out of 35 BCR's (not including other U.S. Pacific Islands, and U.S. Caribbean Islands where they do not regularly occur); BCRs 5, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, and 37. Bald eagles are considered BCC in Service Regions 1, 2, 3, 4, 5, 6, and 8. Bald eagles are also included on the U.S. National BCC list.

To help inform the decisions contemplated in this PEIS, the Service assembled a team of biologists and biometricians in February 2015 to compile relevant scientific data and to conduct appropriate scientific analyses. Much of this work focused on gathering data to estimate sustainable take rates and take limits. The team compiled recent data on population size and trends for the bald and golden eagle, generated estimates of contemporary survival and fecundity rates, and used these data in models to predict future population trends and the ability of bald and golden eagles to withstand additional mortality in the form of permitted take. This information is summarized in the U.S. Fish and Wildlife Service document titled “Bald and Golden Eagles – Population Demographics and Estimation of Sustainable Take Rates in the United States, 2016 Update” (USFWS, 2016, available with this PEIS). The subsequent information summarized here comes from this document, and interested readers should consult that reference for details on methods and analysis procedures.

Demographic Rates and Characteristics

Survival

USFWS (2016) estimated bald eagle survival rates over the period 1996–2014 from band recoveries. Analyses suggested juvenile bald eagles had lower survival rates than older age-classes, but survival among the older age classes was similar. Additionally, bald eagles in the Southwestern U.S. had different survival rates than elsewhere (Table 3.2-1).

Table 3.2-1. Bald eagle annual survival rate estimates, 1996–2014 (USFWS, 2016).

	Estimate	Lower 95% Credible Interval	Upper 95% Credible Interval
Annual Survival [a]			
HY, not Southwest	**0.86**	**0.80**	**0.90**
AHY, not Southwest	**0.91**	**0.86**	**0.94**
HY, Southwest	**0.66**	**0.31**	**0.87**
AHY, Southwest	**0.93**	**0.73**	**0.99**
Recovery Probability	**0.03**	**0.03**	**0.04**

[a] *Abbreviations are: HY = hatching-year; AHY = after hatching-year; SW = southwest (west of the 100th meridian and south of 40° north latitude).*

Causes of Mortality

Trauma and poisoning have been the leading causes of death for bald eagles submitted to the National Wildlife Health Center since 1975 (Russell and Franson, 2014), so anthropogenic factors account for most discovered bald eagle deaths. However, inferences from opportunistically found dead raptors can be misleading indicators of the overall importance of different mortality agents, because deaths from some causes are more apt to be discovered (Kenward et al. 1993). A study of satellite-tagged bald eagles from Florida, which usually provides less-biased information on the relative importance of different mortality factors, indicated starvation and disease, vehicle collisions, electrocution, and poisoning, in that order, were leading causes of death (Millsap et al., 2004).

Productivity

USFWS (2016) compiled data on bald eagle productivity from 17 study areas in the U.S. over the period 1995–2014. Productivity differed between the Southwestern U.S. and elsewhere, with lower productivity in the Southwest (median = 0.73, 95% credible interval = 0.40 – 1.36) than the rest of the U.S. (median = 1.12, 95% credible interval = 0.73 – 1.72).

Population Size

USFWS (2016) estimated the number of occupied bald eagle nesting territories in the coterminous United States from a dual-frame survey coordinated by the Service in 2009 (see Attachment 3: Table A3-5 in USFWS, 2016). Combined with an existing estimate for Alaska from 2009, the total number of occupied bald eagle nesting territories in the United States in 2009 was estimated at 30,600 (95% confidence interval = 24,500 – 36,600; Figure 4, USFWS 2016). USFWS (2016) used these data and conservative estimates of the proportion of the population that consisted of breeding adults to estimate a median bald eagle population size of 143,000 nationally (20th quantile = 126,000) in 2009; estimates for each prospective bald eagle EMU are provided in Table 3.2-2. Increases in the number of occupied nesting territories and inferred population size between the time of delisting under the ESA (using pre-2007 data; USFWS, 2009a) and 2009 were observed in all current bald eagle EMUs except the Northern Rockies (Figure 3.2-5). Differences in methods for the two time periods likely account for some of the apparent population trends (USFWS, 2016).

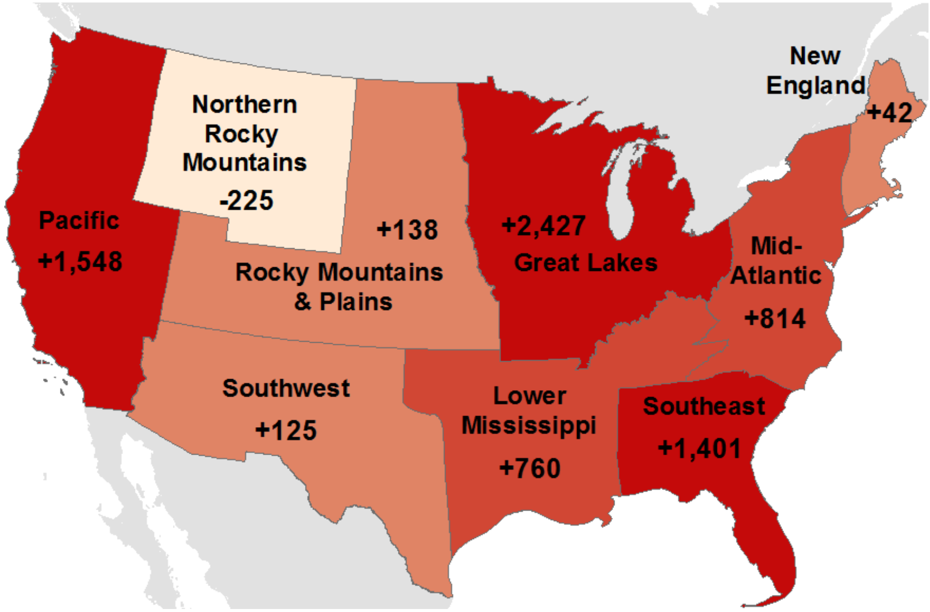
The total nationwide bald eagle population estimate of 143,000 individuals here is lower than the Service estimated in the 2009 FEA (155,473 individuals) (Table C3, USFWS 2009a), even though bald eagle populations have continued to grow. The reason for that discrepancy is the Service used updated estimates of survival rates and productivity to estimate population size and sustainable take rates in 2016. Our updated estimates for survival were similar to those used in 2009, but our productivity estimates were substantially lower than the values used in 2009. This is largely because we conducted a more thorough literature review to support the 2016 productivity estimate, thus the updated values are likely more representative of the full geographic range of the bald eagle in the United States. Despite the lower productivity estimate, the Service's estimate of total population size for bald eagles in the coterminous U.S. increased from 2009 to 2016 (68,923 in 2009 to 72,434 in 2016) due to the substantial increase in the estimated number of occupied nesting territories in the lower 48 states over that period. However, the Service did not have any data with which to update the estimated number of occupied nesting territories for Alaska in 2016, so we used the same number as in 2009 (15,000). When we modeled population size in Alaska using the same number of occupied nesting territories as in 2009 but with lower productivity, our updated population estimates for Alaska are lower (70,544 in 2016 versus 86,550 in 2009). The numbers are not an indication that bald eagles are doing poorly in Alaska, they merely reflect that we updated our technical information, yielding a lower estimated total population size. Even the amount of increase in the lower 48 is affected by the lower productivity value: if we used the 2009 productivity values in our 2016 models, the new estimate for the lower 48 would be around 80,000 – 85,000 rather than 72,000. However, the primary reason the total U.S. population size estimate for the bald eagle is lower in 2016 than in 2009 is because we have refined our estimate of population size for Alaska downward slightly based on the updated estimate of productivity.

Table 3.2-2. Estimated total U.S. bald eagle population size in 2009, from USFWS (2016)

Management Unit	*N*	N_{20th}	*h*	h_{20th}	*H*	H_{20th}	Source
Alaska [a]	70,544	62,935	0.007	0.008	494	494	USFWS (2009)
Great Lakes	27,440	24,065	0.080	0.060	2,195	1,444	Post-Delisting Survey
Lower Mississippi	5,640	4,622	0.080	0.060	451	277	Post-Delisting Survey
Mid-Atlantic	8,244	7,201	0.080	0.060	660	432	Post-Delisting Survey
New England	3,017	2,729	0.080	0.060	241	164	Post-Delisting Survey
Northern Rocky Mountains	1,569	720	0.080	0.060	126	43	Post-Delisting Survey
Pacific	12,102	10,504	0.080	0.060	968	630	Post-Delisting Survey
Rocky Mountains and Plains	1,583	1,411	0.080	0.060	127	85	Post-Delisting Survey
Southeast	12,190	10,788	0.080	0.060	975	647	Post-Delisting Survey
Southwest	648	533	0.045	0.038	29	20	Post-Delisting Survey
Alaska – FW [a]	70,544	62,935	0.007	0.008	494	494	USFWS (2009)
Atlantic Flyway	22,279	20,387	0.080	0.060	1,782	1,223	Post-Delisting Survey
Central Flyway	3,209	1,163	0.080	0.060	257	70	Post-Delisting Survey
Mississippi Flyway	31,706	27,334	0.080	0.060	2,537	1,640	Post-Delisting Survey
Pacific Flyway, South	447	391	0.045	0.038	20	15	Post-Delisting Survey
Pacific Flyway, North	14,792	13,296	0.080	0.060	1,183	798	Post-Delisting Survey
Total US	142,977	125,508			6,273	4,240	
Total US (excluding AK)	72,434	62,572			5,772	3,742	

[a] *Population size estimates for Alaska are approximations based on limited survey information. Because of this added uncertainty, the Service proposes to use a lower management objective factor for Alaska that results in a take limit comparable with that estimated in 2009 (USFWS, 2009a).*

Note: Population size is presented at the median (N) and 20th quantile (N_{20}) by potential eagle management unit (EMU). Estimated sustainable take rates (h) and take limits (H) are also presented with the median and 20th quantile for each EMU. Take rates and limits are constrained so as to maintain an equilibrium size as least as large as N (or N_{20}).



Management Unit	Occupied Nests 2007	2009	2009 95% Credible Interval
Alaska	15,000	15,000	12,471 – 17,529
Great Lakes	3,452	5,879	4,769 – 6,989
Lower Mississippi	447	1,207	753 – 1,661
Mid-Atlantic	952	1,766	1,373 – 2,159
New England	603	645	577 – 713
Northern Rocky Mountains	564	339	0 – 751
Pacific	1,039	2,587	2,073 – 3,101
Rocky Mountains and Plains	200	338	281 – 395
Southeast	1,210	2,611	2,180 – 3,042
Southwest	51	176	119 – 233

Figure 3.2-5. Apparent change in estimated occupied bald eagle nesting territories in the coterminous U.S. by EMU between the time of delisting (pre-2007 data) and 2009, from USFWS (2016).

Population Trajectory

The U.S. Geological Survey Breeding Bird Survey (BBS) index trend estimate for the bald eagle over the entire BBS coverage area for the period 1966 – 2012 is 5.3% (95% credible interval = 4.1% – 6.6%), though trends for the area that include Alaska have been closer to stable (0.08%, 95% confidence interval = -8.41 – 5.44%) (Sauer et al., 2014). Of particular note, the decline indicated for the Northern Rockies EMU in the number of occupied nesting territories is not reflected in the BBS data, which shows a population change of 8.7% (95% confidence interval = 5.1% – 13.1%) from 2003 – 2013 (Sauer et al., 2014).

USFWS (2016) used a demographic model to predict that the number of bald eagles in the U.S. outside the Southwest (including Alaska) will continue to increase until populations reach an equilibrium at about 228,000 (20^{th} quantile = 197,000) individuals (Figure 3.2-6). The model predicted that bald eagles in the Southwest will also continue to increase until reaching an equilibrium at about 1,800 (20^{th} quantile = 1,400) individuals (Figure 3.2-7). USFWS (2016) cautioned that these predictions are only valid and relevant to the extent that environmental and biological conditions remain as they were over the time when the vital rates were measured. This critical assumption is likely to be less true the further into the future the projections go due to the cumulative impacts discussed in *Chapter 4*, *Cumulative Impacts* of this PEIS and perhaps other unforeseen factors. These projections also assume that food availability and other factors do not become limiting.

Management Unit Comparison

USFWS (2016) used band recovery data to assess whether the EMU configurations under consideration differed in terms of capturing bald eagle movements across seasons and life stages. USFWS (2016) reported that 94% (range = 67 – 96%) of bald eagles were banded and recovered in the same Flyway EMU compared to 84% (range = 43–100%) within the same 2009 EMU.

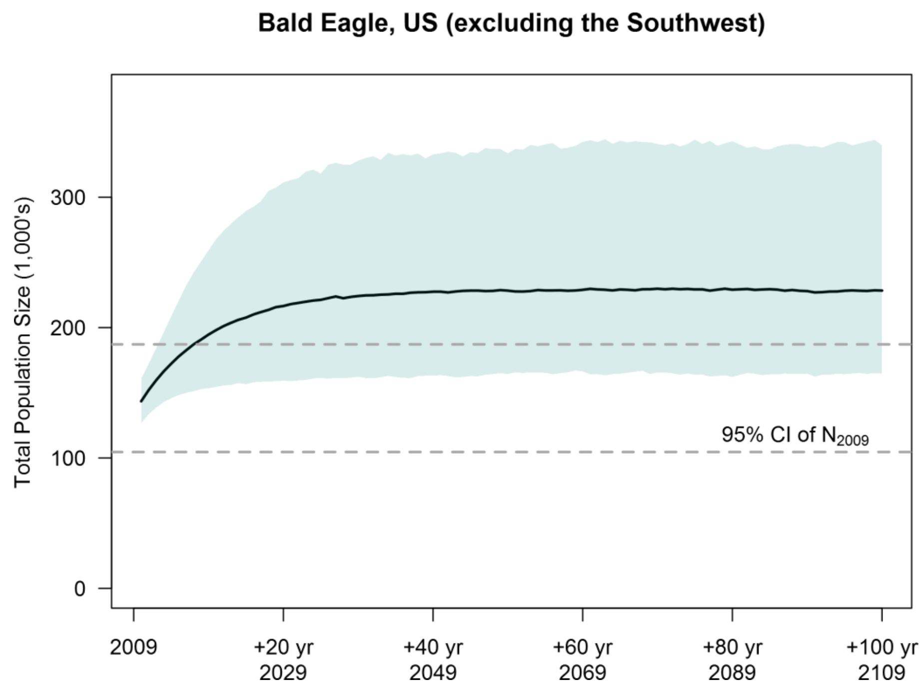


Figure 3.2-6. Projected bald eagle population in the U.S. excluding the Southwest, from USFWS (2016).

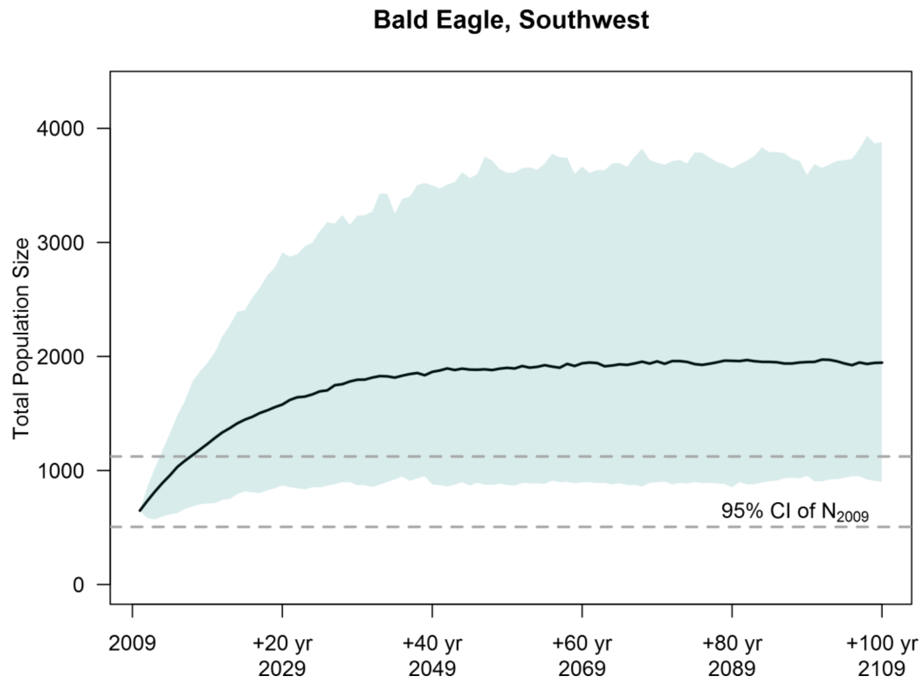


Figure 3.2-7. Projected bald eagle population in the American Southwest, 2009-2109, from USFWS (2016).

3.2.1.3 Disturbance

Where a human activity agitates or bothers bald eagles to the degree that causes injury or substantially interferes with breeding, feeding, or sheltering behavior and causes, or is likely to cause, a loss of productivity or nest abandonment, the conduct of the activity constitutes a violation of the Eagle Act's prohibition against disturbing eagles (*see* 50 C.F.R. 22.3). The circumstances that might result in such an outcome are difficult to predict without detailed site-specific information (USFWS, 2007a).

Many studies have evaluated the sensitivity of bald eagles to different human activities (Mathisen, 1968; Stalmaster and Newman, 1979; Skagen, 1980; Gerard et al., 1984; Fraser et al., 1985; Russell and Lewis, 1993; Brown and Stevens, 1997; Grubb et al., 2002). Overall, these studies show that individual bald eagles react differently to disturbance; what could cause nest abandonment to one pair of bald eagles may be readily tolerated by another. This variability comes from differences in the degree to which eagles are exposed to the disturbance (e.g., whether or not they are visually buffered from it by vegetation), and prior experiences of individuals to human activity. Increasingly, bald eagles appear to be adapting to human activity, as evidenced by an increasing number of successful nests in urban and suburban areas (Millsap et al., 2004).

The U.S. Fish and Wildlife Service has developed a document entitled "National Bald Eagle Management Guidelines" (NBEMG; USFWS, 2007a) that provides an overview of legal and biological factors that should be considered when assessing the potential for disturbance of bald eagles. Major considerations are repeated below, but we refer readers to the NBEMG for additional details; unless otherwise noted, the material presented in this section is based on the NBEMG.

Human activities that cause prolonged absences of breeding adult bald eagles from their nests can jeopardize both eggs and nestlings (Figure 3.2-8). Depending on prevailing weather, this may cause the eggs either to overheat or to cool off excessively, and then fail to hatch. Unattended eggs and nestlings are also vulnerable to predation. Irregular feeding of nestlings by adults due to human disruption can harm nestlings. Adults startled when incubating or brooding nestlings may damage eggs or injure their nestlings as they abruptly leave the nest. Older nestlings may also be startled by loud noises or intrusive human activities and then prematurely jump from the nest before they are able to fly properly, and be injured or killed in the fall. In general, susceptibility to nesting failure as a result of disturbance-induced abandonment is greatest early in the nesting season, while risks of exposure and startling are greatest towards the end of the nesting season (Table 3.2-3).

Human activities near or within foraging areas and communal roost sites may prevent eagles from feeding or taking shelter, especially if no other adequate feeding or roosting sites are available (Figure 3.2-9). Human disturbances may represent a threat to wintering bald eagle populations by causing displacement to areas of lower human activity, if those areas are of lower quality (e.g., offered less food) or are energetically costly (e.g., lay at a greater distance from food resources) (Stalmaster, 1976; Stalmaster and Newman, 1978; Brown and Stevens, 1997). Human disturbances may also interfere with foraging behavior of eagles (Mathisen, 1968; Stalmaster, 1976). Recent studies suggest that at least in in some areas, winter bald eagle roosts may actually constitute a complex of interrelated locations that individuals move regularly among, presumably taking advantage of local foraging opportunities around whichever roost is being used at a particular time (Watts and Mojica 2012). This greatly complicates assessing when loss of a particular roost might result in impacts severe enough to be considered take under the Eagle Act.

Figure 3.2-8. Nesting bald eagles.

Table 3.2-3. Nesting bald eagle sensitivity to human activities, from USFWS (2007a)

Phase	Activity	Sensitivity to Human Activity	Comments
I	Courtship and Nest Building	Most sensitive period; likely to respond negatively	Most critical time period. Disturbance is manifested in nest abandonment. Bald eagles in newly established territories are more prone to abandon nest sites.
II	Egg laying	Very sensitive period	Human activity of even limited duration may cause nest desertion and abandonment of territory for the breeding season.
III	Incubation and early nestling period (up to 4 weeks)	Very sensitive period	Adults are less likely to abandon the nest near and after hatching. However, flushed adults leave eggs and young unattended; eggs are susceptible to cooling, loss of moisture, overheating, and predation; young are vulnerable to elements.
IV	Nestling period, 4 to 8 weeks	Moderately sensitive period	Likelihood of nest abandonment and vulnerability of the nestlings to elements somewhat decreases. However, nestlings may miss feedings, affecting their survival.
V	Nestlings 8 weeks through fledging	Very sensitive period	Gaining flight capability, nestlings 8 weeks and older may flush from the nest prematurely due to disruption and die.

Figure 3.2-9. Perching bald eagles in Alaska.

Avoiding Disturbance

The NBEMG contains a series of recommendations for avoiding or minimizing the risk of disturbance to bald eagles. The NBEMG were developed drawing from existing state and regional bald eagle guidelines, scientific literature on bald eagle disturbance, and recommendations of state and federal biologists who monitor the impacts of human activity on eagles. Uncertainties still remain concerning the effects of many activities on eagles and how eagles in different situations may or may not respond to certain human activities. The Service recognizes this uncertainty and views the ongoing collection of better biological data on the response of eagles to disturbance as a high priority.

Very generally, the NBEMG recommends: (1) keeping a distance between the activity and the nest, roost, or foraging area (distance buffers); (2) maintaining preferably forested (or natural) areas between the activity and the area of eagle use (landscape buffers); and (3) avoiding certain activities during the season of eagle use (temporal buffers). The spatial and visual buffers serve to minimize visual and auditory impacts associated with human activities. Ideally, buffers would be large enough to protect existing nest, roost, and foraging trees and provide for alternatives or replacements, but there are a number of site-specific factors that should be taken into consideration when designing buffers.

3.2.2 Environmental Consequences

3.2.2.1 General Considerations

The Service manages eagle take at two geographic scales, regional EMUs and the LAP (USFWS, 2009a; 2013a). As noted previously in *Chapter 2, Alternatives*, the Service is considering two alternative EMU configurations: the EMUs established in 2009 and the four administrative flyways which may better represent geographic use across seasons. Unlike EMUs, the LAP is unique to each prospective permit and is the eagle population in the area of the permitted activity bounded by, in the case of the bald eagle, the median natal dispersal distance of females, 86 miles. This value has been adopted as Service policy; see USFWS, 2016; Attachment 5, for more details.

Eagle take at the EMU-scale is governed by a take rate that is compatible with maintaining an equilibrium population size equal to or greater than the population objective, the estimated population size in 2009. Take limits at the LAP-scale, on the other hand, apply only to take permitted or authorized by the Service and, while they allow for local population declines under some situations, they are intended to prevent local extirpation of eagles – both breeding and non-breeding. The Service recognizes that some, perhaps even most, eagles taken at a permitted project will derive from natal areas outside the LAP. Despite this, given fidelity to migration corridors and wintering areas by both bald and golden eagles, the conservation benefits of limiting take at the LAP-scale likely accrue to more than just eagles breeding within the LAP (USFWS, 2016).

Across an EMU, there may be landscapes with some areas in proximity to permitted projects with comparatively high levels of authorized anthropogenic mortality, but offset by other areas where authorized anthropogenic take is low, averaging to a maximum across the EMU equal to or less than the EMU take limit. In cases where take exceeds the EMU take limit, all excessive take must be offset by mitigation that would commensurately reduce ongoing mortality from other sources, such that there is no authorized increase in net mortality (USFWS, 2009a; USFWS, 2013a).

Take Limits at the Scale of EMUs

USFWS (2016) used a potential biological removal (PBR) model to estimate sustainable lethal take rates (h) and take limits (H) for both species of eagle following the approach described in Runge et al. (2009); see USFWS (2016) for specific details. USFWS (2016) used methods that incorporated uncertainty in measures of survival, fecundity, and population size in such a way that the uncertainty could be quantified and incorporated into the take rate estimates and take limits themselves. The medians of demographic parameter distributions were used for the liberal-alternative estimates of h and H. For the conservative estimates of h and H, uncertainty in the input parameters were accounted for by using the 20th quantiles of relevant parameter distributions (denoted h_{20} and H_{20}). The use of median values for relevant parameters in calculating take rates under the liberal alternatives amounts to equally (approximately in a 50:50 ratio) sharing the risk posed by uncertainty in the estimated take rates between over-protecting and over-harvesting eagles. The use of the 20th quantiles under the conservative alternatives amounts to distributing risk in roughly an 80:20 ratio in favor of being more protective of bald eagles than may be necessary to foster stable or growing populations. In all cases, expressions regarding how risk is distributed relate strictly to the risk posed by additive take, and are based on the assumption environmental and biological conditions remain as they were over the time period over which demographic rates were measured.

Outside the Southwest region, USFWS (2016) estimated that h = 0.103 (10.3%) (h_{20th} = 0.09 (9.2%)) for the bald eagle. To remain consistent with management objectives, USFWS (2016) adjusted h to a level compatible with maintaining an equilibrium population greater than or equal to the 2009 population estimate, which resulted in h = 0.08 (h_{20} = 0.06) outside the Southwest (Table 3.2-2). In the Southwest, USFWS (2016) noted that the 2009 population was less than one-half of the projected demographic carrying capacity of that region. To allow for greater additional bald eagle population growth in this region, the Service proposes to set h to ½ the take rate at maximum sustainable yield (4.5%), and h_{20th} to the 20th quantile of ½ the take rate at maximum sustainable yield (3.75%), rather than the higher take rates associated with the 2009 population estimate (Table 3.2-2). Again, the methods and approach behind these analyses are explained in some detail in USFWS (2016). In Alaska, because of uncertainties in the population size estimate, managers opted to maintain H and H_{20} at approximately 500, as was recommended in 2009 (USFWS, 2009a). Because the proposed take limit for Alaska is the same number of eagles as in the liberal alternative but the estimated population size is more conservative, the result is that the rate to meet that limit is slightly higher in the conservative (0.8%) than the liberal (0.7%) alternatives. Collectively, across all EMUs the estimated bald eagle take limits are 6,273 and 4,240 under the liberal and conservative alternatives, respectively (Table 3.2-2).

In summary, h = 0.080 (8%) for the bald eagle outside the Southwest region and Alaska, and this is the proposed take rate for the liberal take alternatives (2 and 4) for bald except for the

Southwest and Alaska, where it is lower (4.5% and 0.7%, respectively). For the conservative take Alternatives, h_{20th} = 0.060 (6%) (see Table 3.2-2 and Table 3 in USFWS, 2016), which is the proposed take rate in the coterminous U.S. except for the Southwest and Alaska. The proposed take rates for bald eagles in the Southwest and Alaska in Alternative 3 and 5 are 3.8% and 0.8%, respectively (unless offset). These rates are compared in Table 2.10-1.

Take as a Result of Nest Disturbance

For disturbance to have a potential population-level effect, it has to result in a loss of potential productivity. In 2009, the Service used the EMU-specific productivity (mean number of young fledged per occupied nesting territory) for each species per year as the expected loss for each instance of authorized nest disturbance (USFWS, 2009a). The Service proposes to use the same approach in the new regulations, but with updated productivity values from USFWS (2016). The median values of the productivity distributions were used for liberal alternatives and the 80th quantiles for the conservative alternatives to maintain a protective 20% probability of underestimating the productivity potentially lost as a result of disturbance (USFWS, 2016).

Following this approach, for each instance of bald eagle nest disturbance predicted to result in loss of productivity outside the Southwest Region, the Service proposes to debit take limits by 1.12 or 1.33 eagles, under the liberal and conservative alternatives respectively, per year that the disturbance occurs. For bald eagles in the Southwest region the Service proposes to debit take limits by 0.73 or 0.95 under the liberal and conservative alternatives, respectively.

Take as a Result of Territory Loss

Loss of an occupied nesting territory results in the recurring loss of annual production from that territory. However, this loss of future production is difficult to estimate and account for in debiting take limits. In 2009, the Service quantified future production lost from loss of an occupied territory by comparing equilibrium population size with N and N-1 nesting territories, then debiting EMU take limits by the difference (USFWS, 2009a). This approach assesses the effects of loss indirectly and relates it to a future equilibrium population size rather than the population objective. USFWS (2016) recommended a different approach, where for each instance of occupied territory loss the mean annual per nesting-territory productivity is subtracted from the EMU take limit annually for the generation time of the eagle species. Generation time is defined as the average age of breeders in the population (Caswell, 2001; Bienvenu and Legendre, 2015). Using this as the temporal scale is biologically relevant and sufficiently long to assure that potential longer-term effects can be accounted for by future adjustments to the EMU take limits based on reassessments of eagle populations (USFWS, 2016).

Some nesting territories hold more value than others (Millsap et al., 2015). Moreover, it is often difficult to predict in advance whether an activity would result in loss of a nesting territory or simply the loss of a nest structure and cause a shift in use to an existing or new alternative nest. The latter would have little or no consequence to the eagle population (Watts, 2015). For these reasons, each instance where loss of a nesting territory is a possible outcome requires careful consideration and review on the part of Service biologists. Permitting the loss of high-value nesting territories with a long history of occupancy and production could have greater population-level consequences and should be carefully considered.

USFWS (2016) used the mean of the fertility rate schedule from the matrix demographic models (effectively the mean age of breeders in the population) as the generation time. For the Southwest bald eagle, generation time is 12 years; it is 10 years for bald eagles in the rest of the U.S. outside of the Southwest. The corresponding debits to take limits by EMU are given in Table 13 of USFWS (2016). The Service proposes to adopt the approach recommended in USFWS (2016) to account for take as a result of nesting territory loss as a technical improvement under all alternatives in this PEIS.

Take Limits at the Scale of the Local Eagle Population

The objective of the LAP take limit is to regulate take so that local populations are protected from significant reduction or extirpation due to Service-authorized activities. Although the primary aim is to prevent extirpation of local nesting populations, there is increasing evidence of strong philopatry (the tendency an organism to return to familiar places) to non-breeding areas in bald eagles (Mojica et al., 2008), and the LAP take limits also provide protection from overharvest of wintering and migrating eagles. As noted above, LAP take limits pertain only to take permitted or authorized by the Service, and they are cumulative, taking into consideration all Service-authorized activities affecting the LAP.

In the ECPG (USFWS, 2013a), the Service identified LAP take-rates above 1% as being of concern, and rates of 5% being at the maximum of what should be considered (and under Alternatives 4 and 5, the maximum allowed unless further analysis shows higher take to be compatible with the preservation of bald or golden eagles). The take authorized (within the LAP take limits) is in addition to the average background rate of natural mortality and any ongoing illegal take. The Service collects information on bald eagle mortalities, but that information comes opportunistically and therefore cannot be relied on to provide a quantitative measure of background mortality rates within an LAP. However, Service biologists do consider and take into account available information on unpermitted take within the LAP area; evidence of excessive unpermitted take warrants careful evaluation and would be taken into consideration during the permitting process.

The population size of the LAP is estimated by applying the density estimates for EMUs to the LAP area (USFWS, 2013a). The Service acknowledges this approach is simplistic for at least two reasons: (1) given the eagle density estimates come from nesting or late-summer population surveys, they do not account for seasonal influxes of eagles that occur through migration and dispersal; (2) this approach assumes eagle density is uniform across the EMU, which is inaccurate. USFWS (2016) reports that in most cases the first simplification leads to an underestimate of true density, particularly in core wintering areas during the non-breeding months. As such, this serves as an added buffer against over-take of local-nesting eagles. The second assumption of uniform density leads to greater relative protection of areas with higher than average eagle density within an EMU, and less relative protection in areas of lower density. Improving the ability to estimate true LAP-eagle densities is an area of active investigation by the Service and partners.

To understand the potential consequence to a LAP of bald eagles of authorizing take up to the LAP take limits, USFWS (2016) conducted a series of simulations using demographic models to add a 5% take-rate to background take levels in hypothetical large and small project footprints in high- and low-density EMUs. Models showed adding a 5% take to background mortality levels for bald eagles would not cause declines from current populations in projected LAPs, but would reduce the size of the eventual equilibrium LAP by 38% from the equilibrium without the added mortality (see Figure 12 in USFWS, 2016).

The way the LAP is treated varies among the five alternatives. In the No Action alternative and Alternatives 2 and 3, use of the LAP remains guidance. In Alternatives 4 and 5, it is codified into the proposed regulations such that Service-authorized take within a LAP would be limited to no more than 5% of the estimated total local area population size, unless additional analysis is conducted and demonstrates that permitting take over 5% of that LAP is compatible with the preservation of eagles. It is important to keep in mind that this 5% authorized take within an LAP would be in addition to existing natural mortality and any unpermitted take that is occurring in the LAP.

The Role of Offsetting Compensatory Mitigation

Authorized take above the take limits for each EMU has to be offset by compensatory mitigation that would produce a commensurate decrease in a pre-existing mortality factor, or an increase in carrying capacity, that offsets the permitted mortality (USFWS, 2009b and 2013a). The effect of this mitigation must be that no net increase in mortality occurs within the EMU where the take is authorized (USFWS, 2009a, 2013a).

Currently, the Service requires that offsetting mitigation be undertaken in the same EMU where the take is authorized (USFWS, 2013a), and this spatial scale is believed to still be the most reasonable, taking into account that migrating or wintering eagles originating from other EMUs might also be benefitted by mitigation outside their natal EMU.

There are subtle but important distinctions between the roles of offsetting compensatory mitigation among the five alternatives, as summarized in Table 2.10-1.

Population Monitoring

As noted previously, the take limits are time-sensitive and require regularly updated estimates of population size. More generally, the Service has also implemented the eagle take permit process under a formal adaptive management framework, and monitoring eagle populations and updating population estimates and take limits are critical parts of the adaptive management feedback loop (USFWS, 2013a). For these reasons, the Service proposes to formalize its eagle population monitoring commitments as part of this PEIS process. Specifically, the Service proposes to re-assess population size and trend for both eagle species every six years, and to base that re-assessment on the recurring population surveys described in USFWS (2016) and summarized below.

Under each of the alternatives, the Service would conduct a modified version of the dual-frame bald eagle nesting territory survey in years three and six of each six-year period. As part of that survey effort, the Service would investigate the potential for combining the dual-frame survey estimates of occupied nesting territories with BBS indices to better link the dual-frame results to changes in total population size.

As budgets allow, the Service would continue to conduct and fund additional research and monitoring to improve understanding of bald and golden eagle distribution and habitat use at finer spatial scales. Funding for eagle population monitoring is a high priority of the Service, but as budgets continue to tighten, the certainty of funding for large-scale survey efforts diminishes. Service biologists would continue to look for ways to implement these surveys as efficiently and effectively as possible, including periodic reassessments of statistical power and reliability. The Service would also continue investigating how to integrate other sources of information (e.g., Christmas Bird Counts) with the surveys to improve power and representativeness, and to expand the scale of inference (USFWS, 2016).

3.2.2.2 Effects of All the Alternatives

All the alternatives would have both direct and indirect effects. Direct impacts are those from issuing a particular permit, such as the application of any eagle conservation measures and compensatory mitigation that would offset predicted take in excess of EMU limits. Indirect impacts would result from implementing a given project, including any indirect effects resulting from compensatory mitigation. The duration of the impacts, whether beneficial or adverse, would be both short-term and long-term. Short-term impacts would extend beyond the time of a given project's activities, but would not last more than a few years. Long-term impacts would last until such time as the management approach and regulations undergo further review and changes.

The extent of the impacts from all the Alternatives would range from local through regional to nationwide, that is, it would affect bald eagle populations at all levels, from that of LAPs, to EMUs, to the overall bald eagle population of the United States.

3.2.2.3 Alternative 1: No Action

Under the No Action alternative, described fully in *Section 2.2, Alternative 1: No Action*, the current management objective would be continued: that is, to manage bald eagle numbers consistent with the goal of stable or increasing breeding populations. The baseline population size is the estimated number of bald eagles in 2009 (70,544 for Alaska; 72,434 for the U.S. outside of Alaska, including 648 in the Southwest region; and 142,977 for the entire United States.). Duration of incidental take permits would be up to five years, and permitted take of bald eagles would be capped at 5% of estimated annual productivity in each EMU; EMUs would not change, but would continue to be configured roughly similarly to the eight Service regions. Under the No Action alternative, permitted take of bald eagles would be capped at 5% estimated annual productivity, the most restrictive of all the alternatives (see USFWS 2009a, Table C.3 for current take limits). Service biologists reviewing incidental take permit applications would be encouraged but not required to incorporate the LAP analysis. By not requiring application of the LAP analysis, this alternative could potentially allow large, high-take projects to result in mortality that exceeds 5% of a LAP, though still not exceeding the 5% of estimated annual productivity limit of an entire EMU.

By restricting the duration of incidental take permits to five years, the No Action Alternative (as well as Alternatives 2 and 4) might slightly increase the potential for public scrutiny at the time of permit renewal because a few permits for which substantial changes in operation or new information is available might require additional NEPA analysis at the time of renewal. However, most renewals would not require incorporation of substantial new information, and thus not trigger the need for additional NEPA. Therefore, the actual potential for increased public input under No Action Alternative (and Alternatives 2 and 4) is minor. Retaining the five-year maximum permit duration would not encourage additional applications for take coverage, and therefore not ameliorate the high levels of unauthorized take now occurring.

Overall, because of its restrictive take rate—5% of annual productivity, which is well below the take rates (*h*) shown in Table 3.2-2—and with its requirements for offsetting mitigation, the No Action alternative would likely attain the management objective for bald eagles in all EMUs. That is, it would be consistent with the goal of maintaining the potential for stable or increasing breeding populations. This would constitute a beneficial effect on bald eagle populations, defined as "a positive change in the condition of the resource or a change that moves the resource toward a desired condition."

The magnitude of the beneficial impacts on bald eagle populations from the No Action alternative would be moderate throughout the U.S., that is, a "noticeable change in a resource would occur, and this change would alter the condition of the resource." The noticeable change in question is that bald eagle populations in all of the EMUs would continue to recover and rebound toward their theoretical carrying capacity. However, the ultimate equilibrium population after 100 years would likely fall somewhat short of the theoretical demographic nationwide carrying capacity of 227,800 bald eagles.

3.2.2.4 Alternative 2: Current EMUs, Liberal Take Levels

Alternative 2, described fully in *Section 2.4, Alternative 2: Current EMUs, Liberal Take Levels*, would also aim to manage bald eagle numbers consistent with the goal of stable or increasing breeding populations over 100 years. Permitted take of bald eagles would be capped at levels at or beneath the estimated sustainable take rate within each EMU; EMUs would not change, but would continue to have configurations that approximate the eight Service Regions. Service biologists reviewing incidental take permit applications would be encouraged but not required to incorporate the LAP analysis. By not requiring application of the LAP analysis, this alternative could potentially allow large, high-take projects to result in mortality that exceeds 5% of a LAP, though still not exceeding the take limit of an entire EMU.

The permitted levels of take in Alternatives 2 and 4 are the estimated sustainable bald eagle take rates for the Southwest (4.5%), and the rest of the coterminous United States (8%) shown in column *h* of Table 3.2-2 for the median (N) population estimates. In Alaska, because of uncertainties in the population size estimate, managers opted to maintain H and H_{20} at approximately 500, as was recommended in 2009 (USPWS 2009a), which translates to a take rate of (0.7%). If permits were issued allowing aggregate take up to this level in any given EMU, or in all EMUs combined, and if these take levels were actually reached, then based on the current understanding of bald eagle population dynamics and assuming underlying demographic factors remain unchanged, the risk posed by uncertainty in the demographic rates used to estimate sustainable take would be shared equally between the possibility of authorized take being higher than the level required to maintain stable bald eagle populations and the possibility of over-regulating take.

The maximum duration of incidental take permits would remain five years, which would not encourage additional applications for take coverage, and therefore not ameliorate the high levels of unauthorized take now occurring.

Overall, the added unmitigated take allowed by Alternative 2 would result in populations not reaching levels they would otherwise attain, so at equilibrium, there would be downward pressure holding populations back from reaching the estimated theoretical nationwide carrying capacity of 227,800 bald eagles. However, it is likely some or all of that take would occur regardless of whether a permit was available or not, as has proven to be the case since 2009.

The current EMUs maintained under Alternatives 1, 2, and 3 would not account as thoroughly for the full annual movement and migratory cycle of the bald eagle. The current EMU configuration means a higher percentage of eagles taken would be of individuals that actually derive from a different EMU, and are therefore not directly accounted for in that EMU's take limit.

Given the way risk is handled, Alternative 2 is expected to be beneficial, but there is an almost equal risk that it might be adverse. The main difference between liberal (2 and 4) and conservative (3 and 5) alternatives is the certainty with which allowable take would be sustainable. In the liberal alternatives, given uncertainty, the risk of the take rate being too high or too low relative to the population objective is essentially equal in all EMUs over the coming century.

The magnitude of Alternative 2's impacts could range from potentially negligible to potentially moderately adverse.

3.2.2.5 Alternative 3: Current EMUs, Conservative Take Levels

Alternative 3, described fully in *Section 2.5, Alternative 3: Current EMUs, Conservative Take Levels*, would also strive to manage bald eagle numbers consistent with the goal of stable or increasing breeding populations over 100 years. Alternative 3 would maintain the same current EMUs for bald eagles; however, take limits are lower than Alternative 2 and higher than the No Action alternative. Allowable take per EMU, unless offset, would be 3.8% of estimated population size in the Southwest, 0.8% in Alaska, and 6% in the rest of the country.

The EMU take limits in Alternative 3 are to the estimated sustainable bald eagle take rates (h_{20th}) at the 20th quantile (N_{20th}) population estimates shown in column h_{20th} of Table 3.2-2. As with Alternative 2, in Alaska, because of uncertainties in the population size estimate, managers opted to maintain H and H_{20} at approximately 500, which translates to a take rate of (0.8%). If permits were issued allowing aggregate take up to this level in any given EMU, or in all EMUs combined, these take levels were actually reached, and assuming the underlying demographic factors were to remain unchanged, then based on the current understanding of bald eagle population dynamics' the risk posed by uncertainty in demographic estimates is weighted 80:20 in favor of protecting bald eagles from over-harvest in all EMUs over the coming century.

In addition to incorporating the same limits for when permitted take would require offsetting compensatory mitigation, Alternative 3 would allow for additional mitigation over and above what is strictly required to offset take. The additional mitigation could address any bald eagle conservation need. Also, additional reasonable and practicable avoidance and minimization may be required for long-term permits at five-year evaluations, and compensatory mitigation would be adjusted up or down and applied going forward at five-year evaluations.

Under Alternative 3, the maximum permit duration for incidental take permits to would be extended to 30 years. The intended and expected result would be that more project proponents are likely to seek permit coverage than under Alternatives 1 and 2 because the availability of longer-duration incidental take permits provides greater certainty that longer-term projects would remain authorized over the lifetime of the project. If permitted, those projects would incorporate avoidance and minimization measures that otherwise would not have been implemented.

Service biologists reviewing incidental take permit applications would be encouraged but not required to incorporate LAP analysis under Alternative 3. By not requiring application of the LAP analysis, this alternative could potentially allow large, high-take projects to result in mortality that exceeds 5% of a LAP, though still not exceeding the take limit of the EMU, depending on location.

Given the 80:20 weighting of risk posed by uncertainty, the effects of Alternatives 3 and 5 are expected to be beneficial, but there is some possibility they could be adverse. As stated above, the main difference between liberal (2 and 4) and conservative (3 and 5) alternatives is the certainty with which allowable take would be sustainable. In a conservative alternative such as this one, given uncertainty, the risk of overly restricting take is higher than the risk that take rates are excessive relative to the population objective.

The magnitude of Alternative 3's impacts is likely to be minor to moderately beneficial compared to Alternative 2, and comparable to Alternative 1, although for different reasons. Under Alternative 3, bald eagle populations in all of the EMUs and the nation as a whole would continue to recover and rebound toward their theoretical carrying capacity. While the ultimate equilibrium population after 100 years would not reach the estimated theoretical nationwide carrying capacity of 227,800 bald eagles because of the additional authorized take, it is likely some or even most of that take would occur regardless of whether a permit was available or not, as has proven to be the case since 2009—and with no accompanying implementation of eagle conservation measures.

3.2.2.6 Alternative 4: Flyway EMUs, Liberal Take Levels

Alternative 4, described fully in *Section 2.4, Alternative 2: Current EMUs, Liberal Take Levels*, would also aim to manage bald eagle numbers consistent with the goal of stable or increasing breeding populations over 100 years. Alternative 4 would replace the current EMUs for bald eagles that roughly approximate Service regions with EMUs based on flyways. Permitted take per EMU would be the same as Alternative 2: 4.5% of estimated population size in the Southwest, 0.7% in Alaska, and 8% for the rest of the U.S. Duration of incidental take permits would be up to five years (same as the No Action alternative and Alternative 2) and permitted take of bald eagles would be capped at levels at or beneath the estimated sustainable take rate within in each EMU.

The Eagle Act's Preservation Standard (the Service's management objective) would be defined in the regulations to mean "consistent with the goal of maintaining stable or increasing regional breeding populations, and the persistence of local populations, throughout the geographic range of both species." In some cases compensatory mitigation could be required to meet the preservation standard. By requiring application of the LAP analysis, this alternative would better conserve bald eagle numbers at the local as well as regional scales.

Overall, the added unmitigated take allowed by Alternative 4 would result in populations not reaching levels they would otherwise attain, so at equilibrium there would be downward pressure holding populations back from reaching the estimated theoretical nationwide carrying capacity of 227,800 bald eagles. However, it is likely some or even most of that take would occur regardless of whether a permit was available or not, as has proven to be the case since 2009.

The flyway-based EMUs that would be implemented under Alternative 4 would more accurately correspond to the full annual movement and migratory cycle of the bald eagle. This EMU configuration would have the result that a higher percentage of eagles taken would be of individuals that originated from that EMU and are thus appropriately accounted for in that EMU's take limit.

Compensatory mitigation could be required if permits are issued that exceed the LAP take limit, if additional environmental analysis shows that such mitigation would make the permitted take compatible with the preservation of eagles.

Given the equal sharing of risk of uncertainty, the effects of Alternative 4 are expected to be beneficial but have nearly an equal chance of being adverse. The main difference between liberal (2 and 4) and conservative (3 and 5) alternatives is the certainty with which allowable take would be sustainable. In a liberal alternative such as this one, given uncertainty, the risk of the take rate being too high or low relative to the population objective is balanced.

The magnitude of Alternative 4's impacts could range from potentially negligible to minor adverse to potentially minor to moderately beneficial.

3.3.2.7 Alternative 5: Flyway EMUs, Conservative Take Levels (Preferred Alternative)

Alternative 5, described fully in *Section 2.5*, *Alternative 5: Flyway EMUs, Conservative Take Levels,* would also strive to manage bald eagle numbers consistent with the goal of stable or increasing breeding populations over 100 years, but would manage populations at the regional (EMU) level and at the local population level. Like Alternative 4, Alternative 5 would replace the current EMUs for bald eagles that roughly approximate Service regions with EMUs based on flyways.

The permitted take rate in Alternative 5 is the same as in Alternative 3, as shown in column h_{20th} of Table 3.2-2. If permits were issued allowing aggregate take up to this level in any given EMU, or in all EMUs combined, and if these take levels were actually reached, then based on the current understanding of bald eagle population dynamics and assuming no change in the underlying demographic factors, the risk posed by uncertainty in demographic estimates is weighted 80:20 in favor of protecting bald eagles from over-harvest in all EMUs over the coming century. Alternative 5, like Alternative 3, extends the maximum permit duration for incidental take permits to 30 years, providing the same benefits described under Alternative 3.

The Eagle Act's Preservation Standard (the Service's management objective) would be defined in the regulations to mean "compatible with the preservation of the bald eagle or the golden eagle means "consistent with the goal of maintaining stable or increasing regional breeding populations, and the persistence of local populations, throughout the geographic range of both species." In some cases compensatory mitigation could be required to meet the preservation standard. By requiring application of the LAP analysis, this alternative would better conserve bald eagle numbers at the local as well as regional scales.

The flyway-based EMUs proposed under Alternative 5 (and Alternative 4) would more accurately correspond to the full annual movement and migratory cycle of the bald eagle. This flyway-based EMU configuration means a higher percentage of eagles taken within a given EMU would be of individuals that originate from that EMU, and are thus appropriately accounted for in that EMU's take limit.

Alternative 5's impacts are likely to be moderately beneficial to bald eagles. Alternative 5 is likely to assist the Service in achieving its long-term management goal for the bald eagle, that is, managing bald eagle numbers consistent with the goal of stable or increasing breeding populations over 100 years. Under Alternative 5, bald eagle populations in all of the EMUs and the nation as a whole would continue to grow toward their theoretical carrying capacity, though, once stabilized, would likely fall short of the levels that would be attained in the absence of human caused impacts.

3.3 GOLDEN EAGLE

3.3.1 Affected Environment

3.3.1.1 General Conditions

The golden eagle (*Aquila chrysaetos*) has a worldwide distribution in the Northern Hemisphere, mainly in North America and Eurasia, but including parts of northern Africa (Ferguson-Lees and Christie, 2001; Kochert et al., 2002). As with bald eagles, golden eagles exhibit delayed reproduction, and do not attain the definitive plumage (Figure 3.3-1) until their fifth year (Clark and Wheeler, 1983). Golden eagles exhibit the same pattern as with bald eagles of females being larger than males, and size increasing with increasing latitude; the largest northern golden eagles can weigh over 13.5 lbs. (Kochert et al., 2002).

Golden eagles may travel great distances during dispersal and migration but usually return to within 30 miles of their natal area to breed (Millsap et al., 2015). Breeding golden eagles occupy discrete territories, which are typically used continuously for many years (Kocher et al., 2002; Kochert and Steenhof, 2012; Fig. 3.2-2). Golden eagle pairs establish and defend breeding territories that, as with bald eagles, may contain multiple alternative nests, and nesting territories are often occupied for many decades (Millsap et al., 2015). Re-use of individual nests within a territory is frequent, but some individual nests can go for decades between use (Kochert and Steenhof, 2012). Breeding begins earlier at southern latitudes, but in general occurs with the start of courtship in many areas in January and extends through fledging of young, mostly in June and July in temperate latitudes but into August at the northern extent of the range (Kochert et al., 2002).

Figure 3.3-1. Adult golden eagle (*Aquila chrysaetos*).

Golden eagles typically lay one to three eggs (rarely four) once per year (Kochert et al., 2002), and productivity averages 0.54 young fledged per occupied nesting territory (USFWS, 2016; Figure 3.3-2). Incubation lasts around 42 days, young leave the nest between 45 and 60 days of age, and become independent 45 to 80 days (perhaps longer in some cases) after fledging (Kochert et al., 2002).

Some northern populations of golden eagles migrate southward in winter (McIntyre et al., 2008; 2012; Figure 3.3-3), and some nonbreeding golden eagles from southern latitudes migrate northward in summer (R. Murphy, USFWS, personal communication). As with bald eagles, there is increasing evidence for repeated use of migratory routes, stopover sites, and nonbreeding use areas across years by individuals (McIntyre, 2012, R. Murphy, USFWS personal communication). Golden eagles are not as social as bald eagles outside the breeding season, but they do gather in communal roosts near plentiful food or in extreme weather in some cases (Kochert et al., 2002).

Figure 3.3-2. Golden eagle and nestlings in nest on cliff.

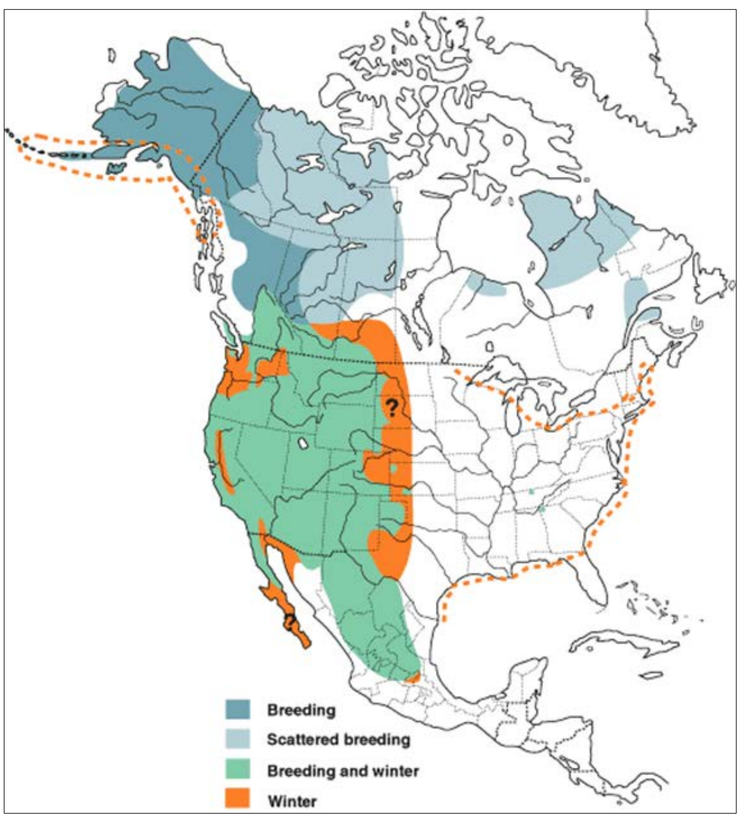


Figure 3.3-3. North American range map of the golden eagle, from Kochert et al. (2002).

Golden eagles feed primarily on small to mid-sized mammals, most commonly rabbits (*Sylvilagus* spp.), hares (*Lepus* spp.), ground squirrels (*Spermophilus* spp.), marmots (*Marmota* spp.), and prairie dogs (*Cynomys* spp.) (Kochert et al., 2002). In some areas carrion is an important part of the diet, as are waterfowl, particularly in winter (Millsap and Vana, 1984; Kochert et al., 2002).

For a discussion of golden eagle habitat, and effects of the alternatives on habitat, please go to *Section 3.4*.

3.3.1.2 Population

Golden eagles are listed as a BCC because of their assessment score, which is based on "population trend, threats, distribution, abundance and the importance of an area to a species" (USFWS, 2008a). Golden eagles are included on 5 out of 35 BCR's (not including other U.S. Pacific Islands, and U.S. Caribbean Islands where they do not regularly occur); BCR 9, 16, 17, 18, and 35. Golden eagles are considered BCC in Service Regions 2 and 6.

As described above for the bald eagle, a team of USFWS biologists began working in February 2015 to assemble relevant scientific data and conduct analyses in support of the PEIS. This information is summarized in the U.S. Fish and Wildlife Service document titled "Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update" (USFWS, 2016). In the following sections we summarize some of the key relevant findings from that document for the golden eagle, but we refer the reader to that document and to the previous discussion for the bald eagle for additional details not repeated here.

Demographic Rates and Characteristics

Survival

USFWS (2016) reported that annual survival varied by age-class for the golden eagle. Estimated annual survival rates by age class are reported in Table 3.3-1.

Table 3.3-1. Golden eagle annual survival rate estimates, 1968 – 2014, from USFWS (2016).

	Estimate	Lower 95% Credible Interval	Upper 95% Credible Interval
Annual Survival[a]			
HY	**0.70**	**0.66**	**0.74**
SY	**0.77**	**0.73**	**0.81**
TY	**0.84**	**0.79**	**0.88**
ATY	**0.87**	**0.84**	**0.89**
Recovery Probability	**0.06**	**0.06**	**0.07**

[a]*Abbreviations are: HY = hatching-year; SY = second-year; TY = third-year; ATY = after-third-year*

Causes of Mortality

USFWS (2016) reported data from 386 satellite-tagged golden eagles provided by collaborators over the period 1997–2013 (USFWS, 2016). This data set was used to estimate the relative importance of various mortality factors for golden eagles. Radio- and satellite-tagged raptors are an important source of unbiased information on causes of mortality compared to leg bands, for which recovery probability varies by the type of death (e.g., raptors struck by vehicles are more likely to be re-encountered than raptors that die of starvation; Kenward et al., 1993). Anthropogenic factors accounted for 56% of all golden eagle mortality, and resulted in an overall increase in the annual mortality rate of about 10% (Table 3.3-2). Importantly, the proportion of golden eagle mortality caused by humans increased with age.

Table 3.3-2. Estimated annual golden eagle survival rates with/without anthropogenic mortality, from USFWS (2016).

	Age Class		
	First Year	Subadult	Adult
Cause-of Death			
Anthropogenic	0.34 (0.23-0.46)	0.57 (0.32-0.81)	0.63 (0.44-0.80)
Natural	0.66 (0.54-0.77)	0.43 (0.19-0.68)	0.37 (0.20-0.56)
Survival Rate			
With only natural mortality	0.80 (0.76-0.85)	0.92 (0.86-0.96)	0.93 (0.89-0.96)
With all mortality	0.70 (0.66-0.74)	0.80 (0.77-0.83)	0.87 (0.84-0.89)

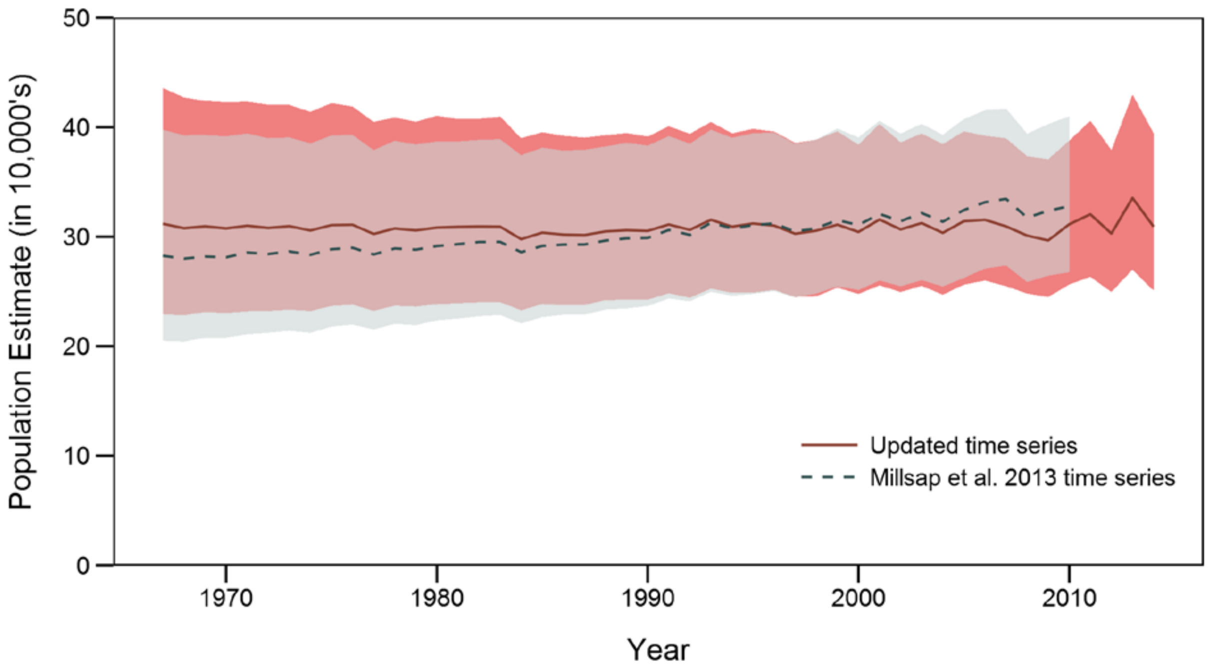
Major causes of golden eagle deaths were (1) starvation, which was largely restricted to eagles in their first year; (2) illegal poisoning; (3) illegal shooting; (4) intra-specific fighting; (5) collisions with power distribution lines, vehicles, and wind turbines; and (6) electrocution (USFWS, 2016, Table 8). This differs from the importance of different mortality factors in a sample of 1,427 golden eagles necropsied at the USGS National Wildlife Health Center (NWHC) from 1975 – 2013; in that sample trauma (likely from collisions) accounted for most deaths, followed by electrocutions (Russel and Franson, 2014). However, golden eagles analyzed at the NWHC were opportunistically found individuals, thus that sample was probably biased in favor of causes of death most likely to be detected.

Productivity

USFWS (2016) summarized estimates of golden eagle productivity from 12 study areas in the U.S. over the period 1995 – 2014. That analysis did not suggest any strong regional differences in productivity, and yielded an estimated mean productivity for the entire U.S. of 0.55 (95% credible intervals 0.40 – 0.75) young fledged per breeding season per occupied nesting territory.

Population Size

USFWS (2016) updated estimates of golden eagle population size and trend for the western United States. for the period 1967 – 2014, using a model that integrated data from a late summer aerial transect survey of golden eagles conducted annually since 2006 (Nielson et al., 2014) with BBS counts; see Millsap et al. (2013) for more details on this approach. The updated analysis indicated a late summer population averaging 31,000 (20^{th} quantile = 29,000) over the most recent decade (Figure 3.3-4 in this PEIS and Figure 7 in USFWS, 2016), and total coterminous western U.S. population of 30,000 (20^{th} quantile = 27,000) for 2009.



Note: Gray shading is the 95% credible interval for estimates from Millsap et al., 2013, red shading is the 95% credible interval for the updated time series.

Figure 3.3-4. Comparison of time series for golden eagle population estimates in the western U.S., from USFWS (2016).

For Alaska, in 2014 and 2015 the Service funded aerial transect surveys over the same four-BCR area of the interior west in January to estimate midwinter population size (Nielson and McManus, 2014; Nielson et al., 2015). Golden eagles from natal areas above 60° N latitude are usually migratory, as are many individuals from the subarctic regions of Canada and Alaska (Kochert et al., 2002, McIntyre et al., 2008; 2012). Thus, the mid-winter population in the survey area includes resident birds that remain in the coterminous U.S. year-round and migrants that occur at more northern latitudes in the summer, but migrate into the coterminous U.S. for the winter. USFWS (2016) used the increases in counts from late summer to mid-winter to provide a lower bound on the size of the northern migratory population of western golden eagles. That difference was 4,000 (95% confidence interval = 3,800 – 4,100) in 2013 – 2014, and 17,000 (95% confidence interval = 14,900 – 20,200) in 2014 – 2015. USFWS (2016) noted that this mid-winter survey has not been conducted frequently enough to evaluate the meaning and significance of the annual variability in the change in numbers of eagles between late-summer and winter, but these are the first data that allow approximation of the size of the high-latitude migratory golden eagle population in western North America. USFWS (2016) assumed the presumed northern migrant golden eagles are originating from natal areas in Canada (west of the 100th meridian) and Alaska in proportion to the relative area of those regions (76% Canada, 24% Alaska). Based on this, USFWS (2016) concluded that in 2013 – 2014 and 2014 – 2015 around 1,000 – 4,000 mid-winter migrant golden eagles originated from Alaska. The Service used the larger estimate as the population size for Alaska for the liberal PEIS alternatives, and the midpoint as the population estimate for the conservative PEIS alternatives. In comparison, in 2009, the Service coarsely estimated the size of the Alaskan golden eagle population at 2,400 individuals (USFWS, 2009a).

Golden eagles occur frequently in the eastern United States, primarily as winter migrants from breeding and natal areas in northeastern and northcentral Canada (Morneau et al., 2015). Recently, the size of this population has been estimated at 5,000 (20th quantile = 4,000) (Dennhardt et al., 2015).

USFWS (2016) pooled estimates for the western United States, Alaska, and eastern U.S. populations to obtain an estimate of the total U.S. golden eagle population size in 2014 for the purpose of computing contemporary take limits, as reported in Table 3.3-3. USFWS (2016) used this same approach, but with the 2009 population size estimate for the coterminous western U.S., to set the population objective for the golden eagle at 39,000 (20th quantile = 34,000).

Population Trajectory

The updated summer golden eagle population trend for the coterminous western U.S. from USFWS (2016) did not differ substantially from the trend reported by Millsap et al. (2013), with an annual rate-of-change of 1.0 (95% credible interval = 0.99–1.01) over the most recent decade (Figure 3.3-4 and Figure 7 in USFWS, 2016). USFWS (2016) projected golden eagle populations forward using a population projection model and demographic rates reported above; that annual rate-of-change averaged 0.998 (95% confidence interval 0.997–0.999), and suggested that golden eagle numbers in the U.S. might be gradually decreasing toward a new, lower equilibrium population size of around 26,000 individuals (Figure 3.3-5 and Figure 8 in USFWS, 2016). USFWS (2016) pointed out that 95% confidence limits for the demographic model projection broadly overlap the 95% credible intervals for the composite model projection, so the results are generally consistent despite their differing ramifications. However, USFWS (2016) noted that the demographic projections were consistent with the expected effect of the high rate of anthropogenic mortality observed, and that together these support the interpretation that golden eagle populations are either declining slightly or in the early stages of a decline. As noted previously, with respect to interpretation of projection model trends, the validity of future predictions is dependent among other things on continuation of the biological and ecological conditions under which the vital rates were estimated. The predictions reported here do not take into account conditions that might develop in North America as a result of factors described in *Chapter 4, Cumulative Impacts*.

Table 3.3-3. Estimated total golden eagle population size in 2014 at the median (N) and 20^{th} quantile (N_{20th}) by potential EMU, from USFWS (2016).

Management Unit	N	N_{20th}	h	h_{20th}	H	H_{20th}	Source
Alaska	4,091	2,544	≈0	≈0	0	0	Nielson et al. 2014, 2015
Eastern	5,122	4,002	≈0	≈0	0	0	Dennhardt et al. 2015
BCR 5	189	114	≈0	≈0	0	0	USFWS 2016
BCR 9	6,596	5,682	≈0	≈0	0	0	USFWS 2016
BCR10	5,675	4,851	≈0	≈0	0	0	USFWS 2016
BCR11	836	519	≈0	≈0	0	0	USFWS 2016
BCR 15	72	38	≈0	≈0	0	0	USFWS 2016
BCR 16	4,258	3,585	≈0	≈0	0	0	USFWS 2016
BCR 17	9,837	8,091	≈0	≈0	0	0	USFWS 2016
BCR 18	1,459	1,091	≈0	≈0	0	0	USFWS 2016
BCR 32	718	549	≈0	≈0	0	0	USFWS 2016
BCR 33	418	247	≈0	≈0	0	0	USFWS 2016
BCR 34	411	229	≈0	≈0	0	0	USFWS 2016
BCR 35	786	528	≈0	≈0	0	0	USFWS 2016
Atlantic/Mississippi	5,122	4,002	≈0	≈0	0	0	Dennhardt et al. 2015
Central Flyway	15,327	13,210	≈0	≈0	0	0	USFWS 2016
Pacific Flyway	15,927	14,437	≈0	≈0	0	0	USFWS 2016
Total (US west)	31,254	30,191			0	0	USFWS 2016
Total (Contiguous US and Alaska)	40,467	34,193			2	0	USFWS 2016

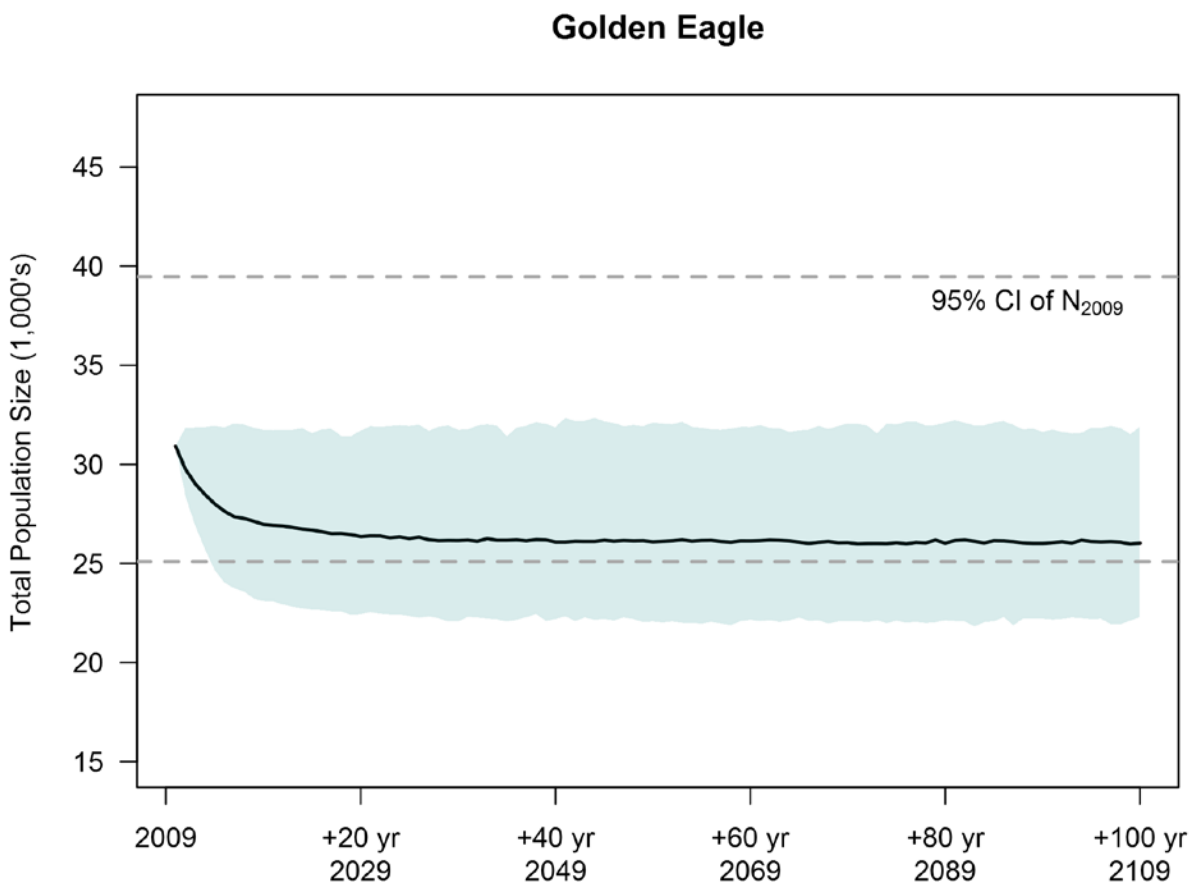


Figure 3.3-5. Golden eagle population projection from 2009 to 2109 for the western coterminous U.S.

Management Unit Comparison

USFWS (2016) used band recovery data to assess whether the EMU configurations under consideration differed in terms of capturing golden eagle movements across seasons and life stages. USFWS (2016) reported that 73% (range = 0 – 86%) of golden eagles were banded and recovered in the same 2009 EMU compared to 84% (range = 50 – 87%) within the same Flyway EMU.

3.3.1.3 Disturbance

As with bald eagles, where a human activity agitates or bothers golden eagles to the degree that causes injury or substantially interferes with breeding, feeding, or sheltering behavior and causes, or is likely to cause, a loss of productivity or nest abandonment, the conduct of the activity constitutes a violation of the Eagle Act's prohibition against disturbing eagles (*see* 50 C.F.R. 22.3). The Service has not developed specific guidelines for management of disturbance of golden eagles, but many of the concepts and management considerations in the NBEMG apply generally to golden eagles as well. One notable difference is that golden eagles have not demonstrated the same level of adaptation to human disturbance and land-use conversion that bald eagles have, and as a consequence the effects of habitat loss and disturbance may be having more substantial population-level effects on golden eagles (Kochert and Steenhof, 2002). There is documentation in the literature of relatively minor human activities in the vicinity of golden eagle nests causing nest abandonment or death of young (Boeker and Ray, 1971; Suter and Jones, 1981; Stedl al., 1993; Colorado Division of Wildlife, 2008).

3.3.2 Environmental Consequences

3.3.2.1 General Considerations

The methods and approach used for golden eagles are the same as for bald eagles, so that this section will just present the results and conclusions particular to the golden eagle.

Take Limits at the Scale of EMUs

USFWS (2016) used the same PBR model as described earlier for the bald eagle to estimate sustainable take rates for golden eagles. That analysis showed that while golden eagles could likely sustain take rates of around 10%, existing levels of unpermitted take were essentially at that level, thus there was no capacity for additional unmitigated take given the objective of maintaining stable populations at 2009 levels (USFWS, 2016). Consequently, the Service has concluded that the appropriate take rates for golden eagles is zero (Table 3.3-3 and Table 11 in USFWS, 2016), as was the case in 2009.

This analysis suggested the comparatively high observed mortality rate, particularly for adult golden eagles, is likely constraining population size to an equilibrium level well below what might otherwise be the case. Adding further unmitigated mortality would likely cause golden eagles to decrease to a lower population size, and would thus be incompatible with the Service's population objective for this species.

Take as a Result of Nest Disturbance

As noted above, for disturbance to have a population-level effect, it has to result in a loss of potential productivity. Following the approach described for the bald eagle, USFWS (2016) concluded that for each instance of nest disturbance predicted to result in loss of productivity, take limits for golden eagles should be reduced by 0.54 (50^{th} quantile) or 0.59 (80^{th} quantile), respectively.

Take as a Result of Territory Loss

Loss of an occupied nesting territory results in the recurring loss of annual production from that territory. As with the bald eagle, USFWS (2016) used the mean of the fertility rate schedule from the matrix demographic models (effectively the mean age of breeders in the population) as the generation time. Golden eagle generation time is 11 years. The corresponding debits to take limits by EMU are given in Table 14 of USFWS (2016).

Take Limits at the Scale of the Local Eagle Population

As noted earlier, the Service (USFWS, 2013a) identified LAP take-rates above 1% as being of concern, and rates of 5% being at the maximum of what should be considered (and under Alternatives 4 and 5, the maximum allowed unless further analysis shows higher take to be compatible with the preservation of bald or golden eagles). The take authorized (within the LAP take limits) is in addition to the average background rate of anthropogenic mortality—for golden eagles, this is about 10%. Thus, total anthropogenic mortality for a golden eagle LAP experiencing the maximum permitted take rate of 5% is likely about 15%. As part of the LAP analysis for golden eagles, Service biologists also consider available information on unpermitted take occurring within the LAP area; evidence of excessive unpermitted take warrants careful evaluation and will be taken into consideration during the permitting process.

To understand the potential consequence to the LAP of authorizing take up to the levels of the LAP take limits, USFWS (2016) conducted a series of simulations using its demographic models to add a 5% take-rate to background take levels for a hypothetical LAP of the golden eagle. They looked at hypothetical large and small project footprints in high- and low-density EMUs. For the golden eagle, adding 5% take results in a decline in the LAP and eventually lowers the equilibrium as much as 80% (Figure 3.3-6 and Figure 10 in USFWS, 2016). However, the LAP was not extirpated in the scenarios considered.

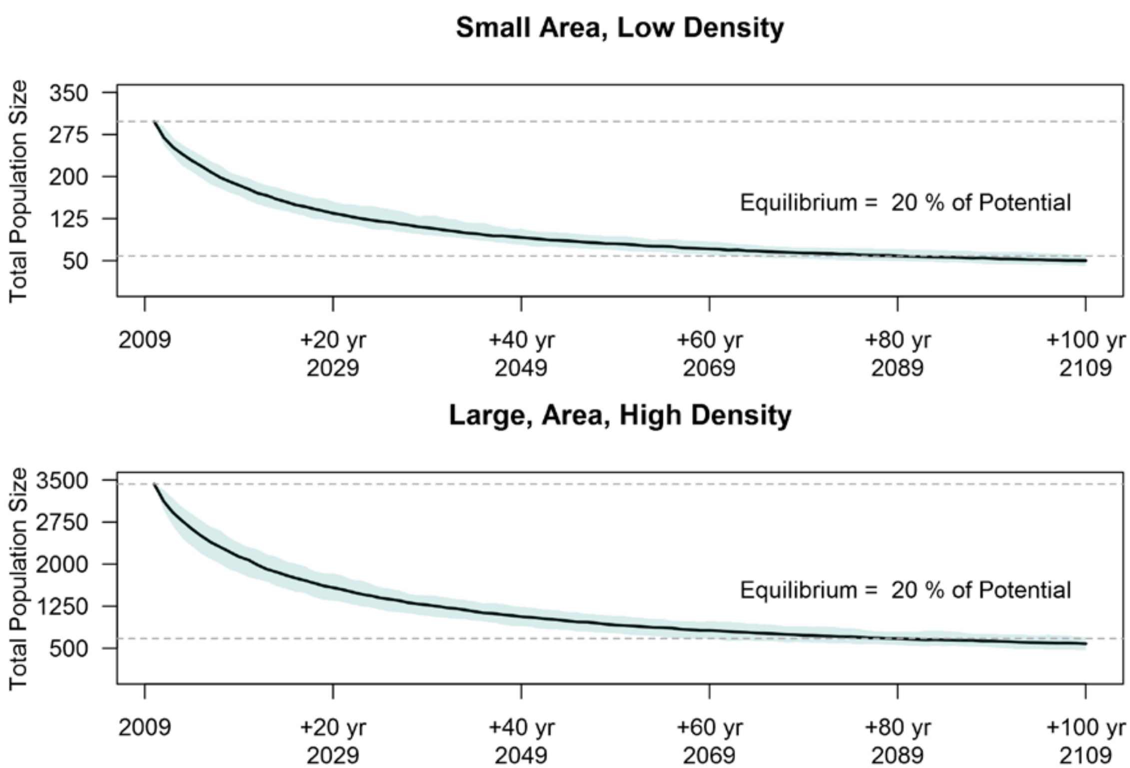


Figure 3.3-6. Effect on golden eagle LAPs of a 5% increase in the take rate, from USFWS (2016).

The Role of Offsetting Compensatory mitigation

In the case of the golden eagle, under any of the PEIS alternatives, essentially all permitted take must be offset, most of all under Alternative 5, which requires compensatory mitigation to be assessed at a greater than 1:1 ratio. Thus, the factor that most limits how much golden eagle take can be permitted is the amount of ongoing unpermitted take or natural mortality that can reasonably be expected to be offset. This has proven a demanding objective to actually accomplish, partly because of the difficulty in quantifying the real effects of conservation actions in reducing mortality. The best understood existing mortality source is electric distribution power line retrofitting to reduce electrocutions (APLIC, 2006 and 2012; USFWS, 2013b). Although the Service considers and is working with partners to test other offsetting compensatory mitigation methods, power line retrofits remain the approach that has the most promise and least risk (USFWS, 2016).

Based on the available data on cause-specific mortality rates, USFWS (2016) estimated that about 500 (20^{th} quantile = 280) golden eagles are electrocuted annually in the U.S. (Table 3.3-3 in this PEIS and Table 9 in USFWS, 2016). Power line retrofitting is not 100% effective and may not be possible everywhere take authorization is needed for golden eagles, so the actual number of permitted golden eagle fatalities that could be offset annually by reducing electrocutions is likely somewhat less than 500. This highlights the need to develop quantifiable measures for reducing other forms of golden eagle mortality (e.g., lead bullet replacement, removal of carrion from highways).

As with bald eagles, the Service continues to believe that compensatory mitigation for golden eagles should be undertaken in the same EMU where the take is authorized (USFWS, 2013a), with exceptions taking into account that migrating or wintering eagles originating from other EMUs might also be benefitted by mitigation outside their natal EMU.

Population Monitoring

As noted previously, the take limits are time-sensitive and require regularly updated estimates of population size. The population monitoring schedule described previously in this PEIS would result in updated estimates of golden eagle population size and status every six years.

3.3.2.2 Effects of All the Alternatives

All the alternatives would have both direct and indirect effects. Direct impacts are those from issuing a particular permit, such as the application of any eagle conservation measures and compensatory mitigation that would offset predicted take in excess of EMU limits. Indirect impacts could result from implementing a given project, including any indirect effects of compensatory mitigation.

The duration of impacts would be long-term, likely lasting a decade or more, until such time as revised population estimates are available and the management approach and regulations are subsequently revised and take effect. The extent of the effects would extend throughout all EMUs, that is, they would be nationwide.

3.3.2.3 Alternative 1: No Action

Under the No Action alternative, described fully in *Section 2.2*, the current management objective would be continued: that is to manage golden eagle numbers consistent with the goal of stable or increasing breeding populations. No new permitted take of golden eagles, without offsetting compensation, would be allowed anywhere in the country under the No Action alternative. Under the No Action alternative, no incidental take permits could be issued east of the 100th Meridian, i.e., in the eastern United States no take of golden eagles could be permitted. The LAP analysis would be encouraged but not required.

The current BCR-based EMUs maintained under the No Action alternative and Alternatives 2 and 3 would not account as thoroughly for the full annual movement and migratory cycle of the golden eagle, and thus would not provide Service managers and incidental take permit application analysts with the most accurate information on actual eagle population distribution. The current EMU configuration means a higher percentage of eagles taken would be of individuals that actually derive from a different EMU, and are therefore not directly accounted for in that EMU's take limit. The inability, under the No Action alternative, to issue incidental take permits for golden eagles east of the 100th meridian, does not prevent most potentially harmful projects from proceeding, but rather precludes the Service from interacting with permit applicants/permittees and imposing compensatory mitigation requirements that could benefit the golden eagle by reducing overall mortality within an EMU and nationally.

By not requiring application of the LAP analysis, this alternative could potentially allow large, high-take projects to result in mortality that exceeds 5% of a LAP.

By restricting the duration of incidental take permits to five years, the No Action Alternative (as well as Alternatives 2 and 4) might slightly increase the potential for public scrutiny at the time of permit renewal because a few permits for which substantial changes in operation or new information is available might require additional NEPA analysis at the time of renewal. However, most renewals would not require incorporation of substantial new information, and thus not trigger the need for additional NEPA. Therefore, the actual potential for increased public input under No Action Alternative (and Alternatives 2 and 4) is minor.

The No Action alternative would not resolve the problem of unpermitted, unauthorized take and relatively high overall levels of anthropogenic mortality that may be causing golden eagle populations to decline. Under the No Action alternative, future golden eagle populations would likely approximate the projection shown in Figure 3.3-5, that is, trending downward toward an equilibrium population size not only well below the estimated theoretical carrying capacity for the U.S. but also potentially below the population objective.

Overall, the effects of the No Action alternative on golden eagle populations according to the definitions shown in *Section 3.1, Methodology*, would be moderately adverse. This is because the management approach and rule revisions associated with the No Action alternative would be insufficiently aggressive to arrest or reverse the potential forecasted decline in the nationwide golden eagle population shown in Figure 3.3-5.

3.3.2.4 Alternative 2: Current EMUs, Liberal Take Levels

Alternative 2, described fully in *Section 2.4*, *Alternative 2: Current EMUs, Liberal Take Levels*, would also aim to manage golden eagle numbers consistent with the goal of stable or increasing breeding populations over 100 years. As to EMUs, Alternative 2 would use BCRs west of the 100th meridian; east of 100th meridian BCRs would be combined into one EMU. Permitted take per EMU would be 0%, unless offset with mitigation measures. The BCR-based EMUs retained under Alternative 2 would not account for the full annual movement and migratory cycle of the golden eagle with the result that compensatory mitigation is less likely to affect eagles in the same EMU as Alternatives 4 and 5. LAP analysis would be encouraged but not required, with the same effects as under alternative 1.

Like the No Action alternative, Alternative 2 would likely be unable to meet the management objective of providing for stable or increasing golden eagle populations in any of the EMUs, or at the national scale, over the coming century. The amount of permitted take (which would always require compensatory mitigation) would be small compared to aggregate, unpermitted anthropogenic mortality which appears to be driving the golden eagle population downward. With regard to mitigation, as with the No Action alternative, compensatory mitigation under Alternative 2 is designed to offset take for golden eagles at a 1:1 ratio. Unlike the No Action alternative, compensatory mitigation would not be limited to actions that have been fully analyzed and metrics to adjust for risk would be applied. Compensatory mitigation could consist of a variety of experimental measures under this alternative, so long as they are expected to offset permitted mortality and are calibrated to account for relative risk posed by the uncertainty. Establishment and promotion of mitigation banks could potentially allow for greater benefits than the No Action alternative, dollar for dollar, because funds would be leveraged and targeted where most needed.

Overall, the effects of Alternative 2 on golden eagle populations according to the definitions shown in *Section 3.1, Methodology*, would be moderately adverse. Like the No Action alternative, Alternative 2 would be unlikely to resolve the problem of unpermitted take and relatively high overall levels of ongoing anthropogenic mortality. Thus, Alternative 2 would not allow for attainment of the management objective of stable or increasing golden eagle populations over the coming century.

The magnitude of the adverse impacts on golden eagle populations from Alternative 2 would be similar to Alternative 1, but slightly smaller due to the expected conversion of some existing and potential unauthorized take to authorized take and the resulting implementation of conservation measures. That effect is expected because of regulatory revisions that would make permit coverage possible in the eastern United States and more attractive throughout the country, including the elimination of the "unavoidable" standard that currently applies to programmatic permits and application of the standard that impacts must be avoided and minimized to the full extent practicable.

3.3.2.5 Alternative 3: Current EMUs, Conservative Take Levels

Alternative 3, described fully in *Section 2.5*, *Alternative 3: Current EMUs, Conservative Take Levels*, like Alternative 2, would retain the use of BCRs west of the 100th meridian, and east of 100th meridian BCRs would be combined into one EMU. Permitted take per EMU would be 0%, unless offset with mitigation measures. The LAP analysis would be encouraged but not required under Alternative 3 with the same effects as under Alternatives 1 and 2.

Under Alternative 3, the maximum permit duration for incidental take permits would be extended to 30 years with five-year evaluations of fatality rates, compensatory mitigation levels, and efficacy of measures to lower risk to eagles. The intended and expected result would be that more project proponents are likely to seek permit coverage than under Alternatives 1 and 2 because the availability of longer-duration incidental take permits provides greater certainty that longer-term projects would remain authorized over the lifetime of the project. If permitted, those projects would incorporate avoidance and minimization measures that otherwise would not have been implemented.

This alternative includes a requirement that every permit must be accompanied by a minimum level of compensatory mitigation separate and distinct from compensatory mitigation to offset take above the take EMU take limit. In spite of additional emphasis on mitigation, Alternative 3 is still not likely to resolve the problem of unpermitted take and the existing high levels of anthropogenic take. Under Alternative 3, future golden eagle populations would be just as likely to decline as under Alternatives 1 and 2 because nothing in the alternative addresses the potential that populations are already experiencing unsustainable take. Without still greater emphasis on compensatory mitigation, and additional measures to protect golden eagles from cumulative affects at more local levels, the potential population declines are unlikely to be more than moderately abated.

Overall, the effects of Alternative 3 on golden eagle populations would be moderately beneficial compared to the No Action Alternative, but still would not meet the Service's management objectives, and would be minor to moderately adverse in terms of achieving the management goal.

3.3.2.6 Alternative 4: Flyway EMUs, Liberal Take Levels

Alternative 4, described fully in *Section 2.6, Alternative 4: Flyway EMUs, Liberal Take Levels*, would implement flyway EMUs for golden eagles; permitted take per EMU would be the same as under all Alternatives: 0% unless offset. Duration of incidental take programmatic permits would be five years, while LAP cumulative effects analysis is incorporated into the regulations.

The flyway EMUs (with the Mississippi and Atlantic flyways combined as a single EMU) proposed under Alternatives 4 and 5 would more thoroughly account for the full annual movement and migratory cycle of the golden eagle.

The Eagle Act's Preservation Standard (the Service's management objective) would be defined in the regulations to mean "consistent with the goal of maintaining stable or increasing regional breeding populations, and the persistence of local populations, throughout the geographic range of both species." Analysis of Service-authorized take within the LAP would be required and the permit would not be issued if authorized take would exceed 5% of the estimated total LAP size, unless the Service can demonstrate through additional analysis that permitting take over 5% of that LAP is compatible with the preservation of eagles. By requiring application of the LAP analysis, this alternative would better conserve golden eagle populations on a local scale.

However, like the previous alternatives, Alternative 4 would not resolve the potential problem of ongoing unpermitted take exceeding sustainable limits. Thus, Alternative 4 would not facilitate the attainment of the Service's management objective of stable or increasing golden eagle populations over the coming century.

Overall, the effects of Alternative 4 on golden eagle populations would be beneficial compared to Alternatives 1 and 2 and may be comparable to Alternative 3, though the impacts would stem from different factors. The proposed management approach and revisions to the regulations associated with Alternative 4 would, as under Alternatives 1 through 3, likely be insufficient to arrest the potential future decline in the nationwide golden eagle population projected in Figure 3.3-5.

3.3.2.7 Alternative 5: Flyway EMUs, Conservative Take Levels (Preferred Alternative)

Alternative 5, described fully in *Section 2.7*, *Alternative 5: Flyway EMUs, Conservative Take Levels*, like Alternative 4, would adopt flyway EMUs for golden eagles (with the Mississippi and Atlantic flyways combined as a single EMU). As in the other Alternatives, all take would require offsetting compensatory mitigation. As with Alternative 4, the cumulative LAP analysis would be required when reviewing permit applications and the Preservation Standard would be modified to incorporate more protection at the local scale. The maximum length of a programmatic incidental take permit under this alternative would be extended to 30 years with the same provisions that would be required under Alternative 3.

The beneficial impacts from Alternatives 3 and 4 would also result from Alternative 5, with the exception of the effects that would occur under Alternative 3 from the requirement for a minimum level compensatory mitigation for every eagle incidental take permit.

Alternative 5, however, would address in two ways the problems of unpermitted take and relatively high overall levels of anthropogenic mortality that preclude the Service from attaining its management objective for golden eagles under the other alternatives. First, longer permit duration is expected to have the effect of converting a greater amount of existing and future unauthorized take to authorized take than the other alternatives, and thereby result in more avoidance, minimization, and compensatory mitigation. Second, and more importantly, the offsetting mitigation ratio would be greater than 1:1, thus some of the currently unsustainable unpermitted take would be addressed through management actions undertaken as compensatory mitigation required by take permits.

Under Alternative 5, future golden eagle populations may stabilize or increase in contrast to the projection shown in Figure 3.3-5. That is, they may come closer to achieving an equilibrium population size that is close to our management objective. This outcome would be achieved both by incentivizing greater participation by developers and project proponents to apply for permits, and by requiring a more aggressive mitigation ratio, greater than 1:1, thereby not only offsetting the authorized take, but at the same time reducing the factors that are currently limiting golden eagle population size.

Overall, these effects of Alternative 5 on golden eagle populations are expected to be minor to moderately beneficial.

3.4 EAGLE HABITAT

3.4.1 Affected Environment

Bald and golden eagles both range over large geographic areas and use a variety of habitats. Bald eagles are typically found near bodies of water such as the shorelines of lakes, rivers, and coastal areas, whereas golden eagles tend to occupy the more mountainous terrain and open, arid areas typical of the western U.S. (USFWS, 2009a). Both eagle species may adjust habitat use based on the time of year (e.g., breeding, migration, wintering), prey availability, nesting territory availability, and disturbance (Buehler, 2000; Kochert et al., 2002). When combined, the habitat used by bald and golden eagles includes most of the U.S. (USFWS, 2009a). A detailed description of eagle habitat of this large area is beyond the scope of this PEIS; however, general habitat characteristics are described for each species. Additionally, a summary of some factors of eagle habitat that may be related to population effects are discussed.

3.4.1.1 Bald Eagle Habitat

Bald eagles generally nest in mature trees or snags in forested areas near bodies of water that offer foraging opportunities (Buehler, 2000). They do nest on cliffs and on the ground in areas where there are no trees, but rarely. They also nest with increasing frequency on human-made structures such as power poles and communication towers (Millsap et al., 2004). Forest size and structure, quality of foraging areas (distance, prey diversity and availability), and low human disturbance are key habitat factors that influence the selection of nesting territories (Buehler, 2000; Livingston et al., 1990).

Migrating and wintering eagles can be highly social, frequently gathering in large numbers in areas near open water or other areas rich in food resources such as freshwater and saltwater fishes, waterfowl, turtles, rabbits, snakes, and other small animals and carrion (Buehler, 2000; Mojica et al., 2008; USFWS, 2009a). Recent studies show that bald eagles use networks of communal roosts strategically associated with foraging areas, and individuals may move daily between regional roosts (Watts and Mojica, 2015).

Habitat Factors

Habitat loss and human encroachment from development continue to be factors for bald eagles (USFWS, 2009a). For example, some of the states with the highest numbers of bald eagles (in particular Florida, Washington, and Virginia; Appendix 3 in USFWS, 2016) have also experienced high rates of housing unit development from 2010 to 2013 (USCB, 2014). Of the 25 geographical locations ranked highest in housing unit development, ten states also have high numbers of bald eagles (Table 3.4-1).

However, many of the fastest-growing counties still have relatively low human population densities and low counts of bald eagles. Bald eagle numbers in most of the United States are increasing or stable (USFWS, 2016), so while there may be impacts to individuals in local areas due to development, the Service does not believe development has caused adverse impacts to overall bald eagle populations so far (USFWS, 2009a).

Table 3.4-1. States with high concentrations of bald eagles ranked by degree of housing unit development.

Rank	State
3	Florida
6	Colorado
7	Idaho
8	Virginia
10	North Carolina
14	Maryland
17	Georgia
18	Indiana
21	Washington
23	Louisiana

Source: USCB, 2014

Though bald eagle populations are stable or growing throughout the United States (USFWS, 2016), the loss of high-quality, unprotected habitat could ultimately limit population size in many areas (Buehler, 2000; Fraser et al., 1996). Potential threats to bald eagle habitat include: urban development (in particular waterfront development due to loss of shoreline nesting, perching, roosting, and foraging areas), energy development (wind generation facilities, oil and gas development), commercial timber harvest and other development (USFWS, 2009a; see *Section 4.1.5* for further discussion). Much of the impact to bald eagles from habitat loss and fragmentation comes in the form of additional disturbance, which was discussed previously in *Section 3.2.1.3*.

3.4.1.2 Golden Eagle Habitat

Golden eagles in the western United States breed in open or semi-open areas in a wide variety of habitats (e.g., tundra, shrubland, grassland, desert rimrock), but generally avoid urban and heavily-forested areas (Kochert et al., 2002). Golden eagles usually nest on rock ledges and cliffs, but also in large trees, steep hillsides or rarely on the ground (Kochert, 2002). Nesting territories are often associated with rugged terrain in suitable vegetation types with limited human development and healthy prey populations (Baglien, 1975; Craig and Craig, 1984; Millsap and Vana, 1984; Bates and Moretti, 1994). Golden eagles no longer breed in the eastern United States (Palmer, 1988), but continue to breed in in Northeastern and Northcentral Canada and migrate from there to wintering areas in the forested Appalachian Mountains and coastal bays and estuaries in the eastern U.S. (Katzner et al., 2012).

When migrating, golden eagles are associated with geographic features such as cliff lines, ridges, and escarpments, where they take advantage of uplift from deflected winds. They often forage over open landscapes, using lift from heated air (thermals) to move efficiently (USFWS, 2011a). Golden eagles can be found throughout much of the U.S. in the winter in a variety of habitats (sagebrush, riparian, grassland, and cliff areas), including grazed areas (Kochert, 2002; Marzluff et al., 1997). In the Eastern U.S. they frequent areas that support large concentrations of waterfowl (Millsap and Vana, 1984; Wingfield, 1991) as well as relatively densely forested mountainous areas (Katzner et al., 2012).

3.4.1.3 Habitat Factors

Habitat loss and degradation due to encroachment from urbanization (e.g., Bittner and Oakley, 1999) and conversion of habitat to agricultural uses (Kochert et al., 2002) have negatively impacted areas historically used by golden eagles (USFWS, 2009a). Though golden eagle populations appear to have been stable over the past 40 years, factors negatively affecting survival may be having an impact now (USFWS, 2016).

Potentially key factors for golden eagles are prey densities and the availability of nest sites near suitable prey populations. Declines in populations of prairie dogs, a major prey species for golden eagles, have been suggested as a habitat-related factor affecting golden eagle populations (Kochert and Steenhof, 2002). Most of the remaining prairie dogs in the southern grasslands are associated with playas (seasonally wet depressions or dry lake beds), which are small and dispersed. Declines in white-tailed and black-tailed prairie dogs have led to declines in availability of prey, which can reduce reproductive performance and survival of young golden eagles (USFWS, 2009a).

Another factor affecting golden eagle habitat has been the increasing number, frequency, and intensity of fires, particularly in the Intermountain West (Kochert et al., 2002). Over approximately the last 35 years, for example, fires have caused large-scale losses of jackrabbit habitat, negatively affecting the golden eagle nesting population at the Snake River Birds of Prey National Conservation Area (Kochert et al., 1999). Nesting success at burned territories declined after major fires and researchers observed a decrease in the number of nesting pairs due to abandonment of burned territories. There is evidence that the widespread abundance of non-native annual grasses has led to the establishment of a more frequent fire cycle in areas that had relatively low fire frequency historically. This issue is discussed further as a cumulative effect in *Chapter 4*.

Due to a large home range and ability to regularly make large-scale movements (Kochert et al., 2002), golden eagles are vulnerable not only to changes in local habitat condition, but also habitat fragmentation and the compounding of multiple threats across the landscape (see *Section 4.1.5, Loss and Fragmentation of Eagle Habitat*). Energy development also affects golden eagle habitat. Surface coal mines have affected nesting sites in Wyoming, and subsidence from underground coal mines negatively affects nests associated with cliffs in Utah (USFWS, 2009a). Increased oil and gas (conventional and coal bed methane) development in Colorado, Montana, Utah, and Wyoming continues in areas centered within the golden eagle range in the lower 48 states. The degree to which these activities result in impacts to habitat, either temporarily or permanently, can vary by location of project, method of extraction, or success of reclamation. However, the introduction of new or improved roads into previously poorly-accessible golden eagle habitat is a common factor in most oil and gas development (USFWS, 2009a). Even if roads and well pads are eventually reclaimed, the life of some field developments can extend for decades. In addition, reclamation times for vegetation (supporting prey and providing line-of-sight screening for nests) in semi-arid to arid areas where many golden eagles occur can be lengthy. Smith et al. (2010) provide an example of negative impacts of oil and gas development on breeding golden eagles in Wyoming and Utah.

The western United States, because of its combination of wide expanses of inexpensive real estate and high winds, has been the focus of extensive wind energy development. Installations of new wind turbine facilities increased the national wind energy-generation capacity, and three of the top five states in terms of capacity are in the western United States. Wind turbines pose a mortality risk to golden eagles (Pagel et al., 2013), and may negatively affect habitat quality if situated in golden eagle breeding or foraging habitat.

3.4.2 Environmental Consequences

Effects of the Alternatives

There would be no direct adverse impacts to bald eagle habitat from the authorization of take of eagles. Issuance of eagle take permits can indirectly result in adverse impacts to eagle habitat from potential loss, alteration, and fragmentation of habitat, and reduced habitat values and suitability during implementation of permitted projects. The amount of habitat that is disturbed is a function of the size of a project, the amount of associated infrastructure, and the degree of disturbance that is already present at a site. These indirect adverse impacts on eagle habitat may be negligible to major depending on the type and duration of the project, as well as the type of habitat in which it is located, i.e., negligible impacts in habitat that is already disturbed versus major impacts in habitat that is sensitive and previously untouched. These effects are considered indirect because impacts to habitat are not generally the result of authorizing eagle permits (although they can be direct if the permit covers take of a nest or includes conservation measures that involve ground-disturbing activities). The impacts to biological and physical resources that occur from implementing a project are not authorized by the Service, thus an eagle incidental take permit is not the direct cause of habitat degradation.

For eagle permits in which take would exceed EMU take limits, compensatory mitigation would seldom be habitat-based. For take that would exceed EMU take limits, compensatory mitigation must consist of actions that either reduce another ongoing form of mortality to a level equal to or greater than the unavoidable mortality, or lead to an increase in carrying capacity that allows the eagle population to grow by an equal or greater amount (see full description in *Section 2.9, Mitigation*). This type of compensatory mitigation is offsetting and different than other types of compensatory mitigation consisting of conservation measures designed to improve conditions for eagles in the long-term by preventing future impacts to habitat. As such there is a meaningful difference between compensatory mitigation that truly offsets take and mitigation related to habitat protection. Under all the action alternatives, offsetting compensatory mitigation could include habitat restoration or enhancement as long as it is shown to offset take at the required rate.

Project proponents that obtain permits would be required to apply standardized compensatory mitigation measures when take limits are exceeded or take is otherwise not in accordance with management objectives. In such cases, measures for compensatory mitigation could include designs to avoid or minimize the risk of disturbance to eagle habitat (as long as it could be shown that take would be offset), possibly resulting in direct benefits to the biological and physical environment through habitat improvements and preservation. The range of beneficial effects on habitat could be minor to moderate: minor impacts would occur where project impacts and mitigation are small and no substantial benefits would result; moderate impacts would occur where project impacts and mitigation are larger and substantial benefits positively change the condition of the habitat. However, when mitigation is not required (such as when take is within EMU take limits), no potential benefits to eagle habitat would occur.

Indirect adverse impacts on eagle habitat could be minimized or altogether avoided by selection of sites outside of habitat, or areas that are of low habitat value because they are already disturbed or fragmented, rather than placing new developments within large and intact habitats. Indirect adverse impacts of a project can also be reduced by compensatory mitigation, which consists of conservation measures that benefit or improve conditions for eagles.

3.4.2.1 Alternative 1: No Action

The No Action alternative consists of current regulations that provide for both standard permits, which authorize individual instances of take that cannot practicably be avoided along with compensatory mitigation requirements that are not standardized, and five-year programmatic take permits, which authorize recurring take that is unavoidable even after implementation of Advanced Conservation Practices. Programmatic take permittees would continue to conduct rigorous monitoring of the permitted activity designed to yield valuable information about the actual take level and the conditions under which the take occurred. In this way, programmatic take permits would present opportunities for research and development of conservation measures.

Under the No Action alternative, the Service could not issue permits for golden eagle take in the eastern United States. Rather than providing an increased level of protection for golden eagles, activities that take golden eagles in the East would continue to proliferate without implementation of avoidance and minimization measures as part of permits that would address impacts to golden eagle habitat. Unpermitted projects in the Eastern U.S. would continue to damage or alter golden eagle habitat without implementing mitigation measures.

Also, many large projects have not applied for permits under the current incidental take regulations. The No Action Alternative would not address the disincentives that project proponents perceive in the current permit application process.

Alternative 1 does allow for requiring compensatory mitigation over and above what is necessary to comply with EMU take limits. Because the 2009 regulations did not incorporate standardized compensatory mitigation provisions, the Service has required compensatory mitigation on a case-by-case basis. A lack of specificity in the regulations as to when compensatory mitigation is required leaves the Service the option to ask for compensatory mitigation for any permit issued for either species. Thus, in this alternative, the Service can use habitat protection as mitigation for bald eagles.

Direct beneficial effects on habitat under the No Action alternative would likely be moderately beneficial overall for bald and golden eagle habitat because of the No Action Alternative's compensatory mitigation options. Indirect minor to major impacts to habitat of both species could indirectly result from loss, degradation, and fragmentation of habitat as the result of the implementation of projects.

3.4.2.2 Alternative 2: Current EMUs, Liberal Take Levels

Under Alternative 2, there would be one permit type only, rather than standard permits and programmatic permits as in the No Action alternative, that that could be issued for up to five years. All permits would contain the standard that take must be avoided and minimized to the maximum degree practicable and would include standardized requirements for compensatory mitigation. Compensatory mitigation would be limited to take that would exceed the EMU take limits. Establishment and promotion of mitigation banks could allow for greater benefits than the No Action alternative because funds would be leveraged and targeted where most needed.

Under Alternative 2, the Service would be able to issue permits for golden eagle take in the eastern United States. Many ongoing and new activities in the East that were implemented in the past without compliance with the Eagle Act, would likely seek permits and apply the required minimization and avoidance measures, so there would likely be minor beneficial impacts to golden eagle habitat through compensatory mitigation. However, most offsetting mitigation would not be habitat-based because protection of existing eagle habitat in its current state would not be accepted as compensatory mitigation for take exceeding EMU limits because it is not additive. However, habitat enhancement and restoration along with protection could be used if they can be demonstrated to increase carrying capacity in the EMU. The result of allowing take permits for golden eagles in the eastern United States would be minor and beneficial to golden eagle habitat.

Implementation of the revised permit regulations would not have direct adverse impacts to eagle habitat. The indirect effects of issuance of eagle take permits would be similar to those discussed under *Section 3.4.2, Environmental Consequences, Effects of the Alternatives*.

Greater conversion of unauthorized take to authorized take than under Alternative 1 would moderately reduce adverse impacts on eagle habitat. Overall, limiting compensatory mitigation to take that is above EMU take limits would reduce the level of habitat protection for eagles compared to other alternatives that are less restrictive (Alternative 1 and Alternative 3).

3.4.2.3 Alternative 3: Current EMUs, Conservative Take Levels

As described for Alternative 2, under Alternative 3 the Service could issue permits for golden eagle take in the Eastern U.S., with similar impacts. Under this alternative, the conservative take levels for bald eagles would allow fewer individuals to be taken without offsetting compensatory mitigation than under the alternatives with liberal take levels, resulting in minor beneficial impacts to bald eagle habitat when habitat improvements can be demonstrated to offset impacts at the necessary rate and are applied as compensatory mitigation to offset the take above EMU take limits.

Under Alternative 3, permits could be issued for up to 30 years. Extension of the maximum permit duration is expected to increase demand for permits and the number of permits issued, with the result that existing projects without permits would gain permit coverage and implement conservation measures for eagles. The longer permit duration is also expected to encourage more future projects to seek permits with similar benefits gained through avoidance, minimization, and compensatory mitigation. Although compensatory mitigation to offset take exceeding EMU limits would still not be habitat based, under Alternative 3 moderate to major beneficial impacts to habitat for both species of eagles are likely to result from the additional minimum level of compensatory mitigation that would be required for each take permit. The Service would encourage applicants to apply such mitigation as a contribution to a conservation bank or other third-party mitigation provider which could apply the funding to protect and/or improve eagle habitat.

As discussed under Alternative 2 above, Alternative 3 would have similar effects on eagle habitat from converting existing and potential unauthorized take into authorized take of eagles.

3.4.2.4 Alternative 4: Flyway EMUs, Liberal Take Levels

Effects on eagle habitat from authorized take of golden eagles in the East, the liberal take levels, and converting unauthorized take to authorized take would be similar to those described in Alternative 2.

The more liberal levels of bald eagle take that does not need to be offset would result in adverse impacts to bald eagle habitat compared to Alternatives 1 and 3, because less offsetting mitigation would be secured. However, compensatory mitigation for take that exceeds take thresholds would typically not be habitat-based since protection of existing eagle habitat is not additive. Habitat enhancement and restoration along with protection could be used if they can be demonstrated to increase carrying capacity in the EMU. Therefore the adverse effects expected from the more liberal take limits in Alternative 4 would be only minor.

The modification of the eagle preservation standard and the incorporation of the LAP cumulative effects analysis would result in situations where the bald eagle LAP take thresholds are exceeded before EMU take limits are reached. Under these conditions a permit would not be issued unless the take over the LAP take threshold was determined to be compatible with the preservation of the bald eagle. One factor that might lead to such a determination would be application of compensatory mitigation within the LAP. Because LAP-based compensatory mitigation could be habitat-based (i.e., it is not required to be offsetting unless the EMU take limits are exceeded), Alternative 4 might provide greater benefits to eagle habitat than Alternative 2.

3.4.2.5 Alternative 5: Flyway EMUs, Conservative Take Levels (Preferred Alternative)

Impacts under Alternative 5 would include many from Alternatives 3 and 4. The most significant beneficial effects on golden eagle habitat would be the result of increasing the compensatory mitigation ratio to greater than 1:1. The amount in excess of 1:1 would be considered more experimental, and might be directed at habitat management actions that would benefit golden eagles but not necessarily directly offset added take. Take of golden eagles in the East would be authorized, resulting in a modest reduction of adverse impacts and introduction of a moderate increase in beneficial effects on golden eagle habitat from mitigation.

As with Alternative 3, longer-term permits available under the extended maximum permit duration would likely increase compliance and permit coverage, resulting in a modest increase in habitat protection for both species that would be secured by requiring compensatory mitigation for a greater proportion of permits.

Adoption of the flyways as EMUs would allow compensatory mitigation to be applied where more likely to benefit eagle populations affected by the permitted activity, and some of this mitigation might be habitat-based. Combining the LAP analysis with conservative take levels in this alternative would reduce adverse impacts on eagle habitat more than when the LAP analysis is combined with liberal take levels as in Alternative 4.

For the above reasons, Alternative 5 is likely to have beneficial impacts to eagle habitat that are comparable to those of Alternative 3, and these two alternatives have greater potential beneficial impacts than Alternatives 1, 2, and 4.

3.5 MIGRATORY BIRDS

3.5.1 Affected Environment

The Service's Division of Migratory Bird Management has begun an effort to develop incidental take regulations under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703–712). We have not yet officially proposed these regulations. However, we published a notice of intent to prepare a PEIS to evaluate the environmental impacts of three regulatory incidental take authorization options (*see* 80 FR 30,032, May 26, 2015). The three potential authorization mechanisms are as follows: 1) a general conditional authorization for incidental take by industry sectors that adhere to appropriate standards for protection and mitigation of incidental take of migratory birds; 2) legal authority for issuing individual incidental take permits for projects or activities not covered under a general, conditional, industry-sector authorization; 3) and/or a procedure for authorizing incidental take by federal agencies that commit in a memorandum of understanding to consider impacts to migratory birds in their actions and to mitigate such take appropriately (*see* 80 FR 30,035).

Currently, 1026 species of birds are considered by the USFWS to be migratory birds under the provisions of the MBTA (*see* 50 C.F.R. 10.13). The Treaties define migratory birds by taxonomic family or species and not by exhibited migratory behavior. For purposes of MBTA protection, an avian species does not have to actually be a migrant. Instead, a migratory bird protected under the MBTA is a bird belonging to a family or species native to the U.S. that is specifically referenced in at least one of the migratory bird treaties between the U.S. and Canada, Japan, Mexico, or Russia. For a more detailed explanation of which species are protected by the MBTA and why, see the most recent Federal Register notice updating the current list of protected migratory bird species at 78 FR 65,844 (Nov. 1, 2013).

The MBTA makes it illegal for anyone to (or attempt to) pursue, hunt, take, capture, kill, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit or otherwise authorized pursuant to federal regulations. *See* 16 U.S.C. § 703.

Migratory birds depend on all habitats in the U.S., and some species may use multiple habitat types in the U.S. and other Western Hemisphere countries during different life cycles, and life stages. These habitats may include but are not limited to alpine, tundra, grassland, wetland, temperate forest, tropical forest, woodland, shrubland, savanna, desert, and marine environments.

Some migratory birds are permanent residents (sedentary populations) (Newton, 2008) and live in the same general habitat year-round, and do not technically 'migrate.' Other birds such as the common poorwill (*Phalaenoptilus nuttallii*) use hibernation, or multi-day torpor to conserve energy (Jaeger, 1949). The majority of bird species, however, conduct annual migrations, dispersal movements, dispersive migration, or at least seasonal movements from breeding to wintering habitat during their annual life cycle, mostly revolving around an annual breeding season (Newton 2008). As such, bird species migrate from areas of low or decreasing food or thermal resources to areas of high or increasing resources; for example birds migrating from colder higher latitudes to more temperate or tropical environments during winter, or birds travelling between different altitudes in the same region or east-west during seasonal movements.

Many Neotropical migrant bird species (birds that migrate to wintering grounds in the Neotropics) are in decline, and have been so for at least four decades (Robbins et al., 1989). Anthropogenic activities which occur in breeding habitat, migration corridors, as well as wintering habitat (e.g., deforestation, habitat conversion, and habitat fragmentation/loss; illegal hunting, pesticide related poisoning, urbanization, energy production and transmission, communication towers, building windows, vehicle impact, wind generation facilities, and climate change) have caused or contributed to these declines (Rappole and McDonald, 1994; Donovan et. al., 1995; Friesen et al., 1995; Sherry and Holmes, 1996; Trombulak and Frissell, 2001; Manville, 2005; Drewitt and Langston, 2006; Drewitt and Langston, 2008; Smallwood and Karas, 2009; Kuvelsky et al., 2010; APLIC, 2012; Dobleer et al., 2013; Loss et al., 2013; Machtans et al.,2013; Smallwood, 2013; Kagan et al., 2014; Loss et al., 2014a,b; Marques et al., 2014; Manville, 2016).

3.5.2 Environmental Consequences

3.2.2.1 Effects under All Alternatives

No direct adverse impacts are expected on migratory birds from the implementation of revised authorized take of eagles. The exception would be where an eagle conservation measure implemented as the result of revised regulations would adversely affect migratory birds. For example, a conservation measure that may reduce the risk of eagles hitting wind turbines might be to mow the grass in turbine fields to reduce the rodent prey base and make the area less attractive to eagles for hunting. This measure would likely have positive effects on raptors and negative impacts on grassland nesting migratory bird species. However, most avoidance, minimization, and compensatory mitigation measures are much more likely to be beneficial to migratory birds than adverse. Some may have negligible or no effect on other migratory birds.

Thus, compensatory mitigation conducted for eagles could have both adverse and beneficial effects on migratory birds, ranging from negligible to moderate: negligible impacts would occur if migratory birds and their habitats would not be affected or changes would be so slight that they would not be of any measurable or perceptible consequence; moderate impacts would occur if effects to migratory birds are readily detectable, long-term, with consequences at the population level, but the continued existence of the species would not be threatened.

Compensatory mitigation under the eagle rule, which includes conservation measures designed to benefit or improve conditions for eagles, would likely improve conditions for many species of migratory birds under all the alternatives. Habitat-based eagle conservation measures will usually protect and/or improve habitat conditions for other migratory birds. Compensatory mitigation designed to reduce eagle mortality would also often provide benefits to migratory birds, particularly other raptors.

Under all the alternatives analyzed in this DPEIS, bald eagle populations are likely to increase from current levels; this could have negative indirect effects on some migratory birds, such as colony-nesting waterbirds which may be increasingly predated by increased numbers of eagles. Although this scenario would not affect many species, impacts could be significant for some species.

It is not possible to discuss in this PEIS all the circumstances where impacts of the revised rule on migratory birds would be significant and need additional NEPA. Instead, an example of a hypothetical scenario is given under which the Service would consider impacts on migratory birds to be so severe or uncertain that the project could not tier off this PEIS and a separate NEPA analysis would need to be conducted prior to permit authorization:

> *For a wind project, the expected take of eagles is well within the EMU and LAP take limits, but the project is likely to kill hundreds of red knots because it is sited near the Delaware beach that red knots depend on to feed and rest during migration. Although it would be the project itself and not the eagle permit that is directly responsible for killing the red knots, it does indirectly contribute to the authorization to operate the turbines that kill the red knots. Also, issuance of the eagle permit is a federal action, which should be in accordance with all federal laws.*

In addition to this example, listed here are significance criteria, which if met or exceeded, could trigger the potential need for additional NEPA prior to permit authorization:

- Changes due to the project affect a large portion of a migratory bird population and the viability of that population.
- Full recovery would not occur in a reasonable time, considering the size of the project and the affected species' natural state.
- Impacts would be outside the natural range of variability for long periods of time or to be permanent.
- Habitat is no longer functional and the degradation or loss of habitat is sufficient to cause native migratory bird populations to leave or avoid the area.

3.5.2.2 Alternative 1: No Action

There would be no direct adverse impacts to migratory birds from the continued implementation of authorized take of eagles.

Because the 2009 regulations did not incorporate standardized compensatory mitigation provisions, the Service has required compensatory mitigation on a case-by-case basis. This inconsistent application of compensatory mitigation would continue under the No Action alternative and would likely result in more compensatory mitigation for bald eagles than under Alternatives 2, 4, and 5. The level of compensatory mitigation conducted for eagles under Alternatives 1 and 3 would likely be comparable to Alternative 5, and could have both adverse and beneficial negligible to moderate effects on migratory birds, depending on the species, but is likely to be significantly more beneficial than adverse overall.

3.5.2.3 Alternative 2: Current EMUs, Liberal Take Levels

Alternative 2, the more liberal take levels for bald eagles would allow more individuals to be taken without compensatory mitigation than under the alternatives with conservative take levels, resulting in greater indirect impacts to migratory birds. More permits may be issued to existing projects, without securing compensatory mitigation requirements. Further, the compensatory mitigation provisions in Alternative 2 provides for the least latitude to secure eagle conservation measures that would also affect other bird species, usually beneficially. Thus this alternative has less potential to improve conditions for migratory birds than the other alternatives.

3.5.2.4 Alternative 3: Current EMUs, Conservative Take Levels

Under this alternative, the conservative take levels for bald eagles would allow fewer individuals to be taken without offsetting compensatory mitigation than under the alternatives with liberal take levels (Alternatives 2 and 4) but more than under Alternative 1. The effects of the different levels of offsetting mitigation required for eagles would in many cases, though not always, also apply to migratory birds, usually beneficially.

The effects of applying compensatory mitigation under Alternative 3 would lead to less indirect adverse impacts on migratory birds because of the requirement that every incidental take permit involve a minimum level of compensatory mitigation. Much of that mitigation is likely to provide additional benefits to migratory birds. Some adverse impacts could occur to migratory birds through such mitigation, but the effects are much more likely to be moderately beneficial overall. Further, the additional conservation measures that would likely be secured by coverage of more activities under permits with an extended duration would also increase the effects on migratory birds, and these are likely to be beneficial in most cases, but adverse in a few. Those would also range from minor to moderate as described in Alternative 2. Thus, the beneficial effects of compensatory mitigation on migratory birds would likely be greater overall under Alternative 3 than under Alternatives 1 and 2.

3.5.2.5 Alternative 4: Flyway EMUs, Liberal Take Levels

Effects from incidental take permits, including requirements for compensatory mitigation, would be similar to Alternative 2, except they would be based on flyway EMUs rather than the current EMUs (Service Regions and BCRs) and there would be largely beneficial effects to migratory birds from incorporation of the LAP cumulative effects analysis in the regulations. Compensatory mitigation would be required if permits are issued that exceed the LAP take limit and environmental analysis shows that such mitigation is warranted to achieve compatibility with the modified eagle Preservation Standard. Alternative 4 would provide some flexibility to require compensatory mitigation in circumstances where take would exceed the LAP take limit, or if otherwise needed to maintain the persistence of local populations across the geographic range of bald or golden eagles. That provision would likely have minor to moderate beneficial impacts to migratory bird habitat.

The ability to apply compensatory mitigation in the larger flyway EMUs could mean that compensatory mitigation may be implemented farther away from where project impacts occur.

For example, a project and its impacts may occur on the Atlantic coast in Maryland, but compensatory mitigation may be applied in Maine. There would be no impacts from compensatory mitigation on migratory shorebirds in Maryland as it would not take place at that location; however, there would be either beneficial or adverse impacts on migratory birds in Maine where the compensatory mitigation is implemented. In some cases, the same species of migratory birds may experience the effects both of the project impacts in Maryland, including avoidance and minimization measures required under the eagle permit, and of the compensatory mitigation in Maine. In other cases, the effects in Maryland and Maine could occur to different migratory bird species. The overall effects to the different species of migratory birds from compensatory mitigation required under eagle permits that is applied in the flyways would be more positive than negative because measures that benefit eagles are more likely to benefit other migratory birds than adversely affect them.

Under Alternative 4, the LAP cumulative effects analysis would be incorporated into the regulations as a buffer to the more liberal take rates allowed in this alternative. Service-authorized take within the LAP would not be authorized if it would exceed 5% of the estimated total local area population size unless further analysis demonstrates that permitting take over 5% of that LAP is compatible with the preservation of eagles. In some cases, projects that are unable to obtain an eagle take permit may not go forward, though, in the Service's experience, those that abandon or site elsewhere represent a small minority. For those new projects that are not implemented, adverse impacts to migratory birds and habitat would not occur. The majority simply proceed without authorization to take eagles generally resulting in greater negative effects on migratory birds.

3.5.2.6 Alternative 5: Flyway EMUs, Conservative Take Levels (Preferred Alternative)

The effects under Alternative 5 would include some from Alternative 3 and some from Alternative 4. The effects of more conservative take limits and extending the maximum permit duration would be the same as in Alternative 3. Effects of adopting flyway EMUs rather than the current EMUs, the modification of the definition of the Eagle Act preservation standard, and the incorporation of the LAP analysis would be the same as in Alternative 4.

The overall beneficial or adverse effects of compensatory mitigation on local populations of migratory birds would likely be greater under Alternative 5 than under Alternative 4 due to increased participation in the permit program that is likely to result from extending the maximum permit duration to more closely align with the duration of long-term projects and the associated conservation measures that would thereby be secured. Moreover, the greater than one-to-one ratio of compensatory mitigation that would be required for golden eagle incidental take permits under Alternative 5 would additionally affect migratory birds, for the most part beneficially.

Expected impacts to migratory birds from this alternative would range from minor and adverse to a small number of species to major and beneficial to other species, with beneficial effects being overall more prevalent.

3.6 OTHER PERMITTED TAKE

3.6.1 Affected Environment

The Service issues several other types of permits that authorize take of eagles under the Eagle Act. This section discusses the current take authorized for both eagle species for take categories collectively called Other Permitted Take (OPT), which includes take for scientific, educational, depredation, falconry (golden eagles), and Native American religious purposes (discussed in *Section 3.7, Cultural and Religious Issues*).

3.6.1.1 Eagle Permits Under the Bald and Golden Eagle Protection Act

Specifically, the take categories considered as OPT for the purpose of this PEIS include:

- 50 CFR §22.21−Scientific Collection & Exhibition;
- 50 CFR §22.22−Native American Religious Use (discussed in *Section 3.7, Cultural and Religious Issues*);
- 50 CFR §22.23−Depredating Eagles;
- 50 CFR §22.24−Falconry; and
- 50 CFR §22.25−Inactive Nest Take During Resource Development or Recovery.

As discussed in more detail in *Section 2.2, Alternative 1: No Action*, the baseline population size for both species of eagle is the number of estimated eagles in 2009 populations. The amount of authorized take that would be considered part of the baseline for this PEIS, and therefore would not be subject to an offsetting mitigation requirement in populations where the take limit is zero, would be unchanged from the 2009 numbers. This baseline take, presented in the 2009 FEA, is based on multi-year averages of reported take from 2002-2007. Historical take refers to all take, including those from existing permits (issued before 2009).

§22.21 Scientific Collecting

The Service may, under the provisions of this section, issue a permit authorizing the taking, possession, transportation within the U.S., or transportation into or out of the U.S. of lawfully-possessed bald eagles or golden eagles, or their parts, nests, or eggs for the scientific or exhibition purposes of public museums, public scientific societies, or public zoological parks. The Service will not issue a permit under this section that authorizes the transportation into or out of the U.S. of any live bald or golden eagles, or any live eggs of these birds.

The Service has not authorized any take of live eagles from the wild for eagle exhibition. All live eagles held under exhibition permits are non-releasable birds, generally transferred from rehabilitators, which because of physical conditions have been determined as unlikely to survive if released. In the six years prior to 2009, scientific collecting permits that authorize take from the wild for bald eagles had been authorized only in Alaska, where bald eagles were not listed under the ESA. In addition, prior to bald eagle delisting, some scientific research was authorized under ESA recovery permits. As shown in Tables 3.6-1 and 3.6-2, an estimated average annual take of three golden eagles (Table 3.6-1) and an estimated average annual take of seven bald eagles (Table 3.6-2) under this section is included in the environmental baseline condition. From 2010-2015, a total of 32 bald eagle eggs (annual average of about five per year) were taken for scientific research purposes, all from Regions 1 and 3 (Table 3.6-3).

Table 3.6-1. Estimated average annual authorized lethal and non-lethal take reported for the golden eagle (2002-2007) – current baseline.

Service Region	22.21 Scientific and Exhibition Permits	22.22 Religious Take Permits	22.23 Depredation Permits	22.24 Taken for Falconry	22.25 Nest Take for Resource Recovery Permits
1	0	0	5	0	<1[a]
2	1	24	0	0	3[b]
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	2	0	8	6	3
7	0	0	12	0	0
8	0	0	0	0	0
Total	**3**	**24**	**25**	**6**	**6**

[a] *One nest authorized over six years.*

[b] *Where the permit did not specify a limit, reported take is provided.*

Table 3.6-2. Estimated average annual authorized lethal and non-lethal take reported for the bald eagle (2002-2007) – current baseline.

Service Region	22.21 Scientific and Exhibition Permits (Reported)[a]	22.23 Depredation/Hazing Permit (Reported)[b]
1	0	2
2 (SW)	0	0
3	0	8
4	0	0
5	0	0
6	4	2
7 (AK)	3	2
8	0	0
Estimated Average Annual Total	**7**	**14**

[a] *Permits authorized included take of eggs, trap and release of birds, and killing of birds.*

[b] *Take authorized and reported hazing was primarily for airports and landfills.*

Table 3.6-3. Permitted take reported 2010-2015 – bald eagle.

Service Region	22.21 Scientific Collecting (Number of Eggs)	22.27 Inactive Nest Removal	22.27 Active Nest Removal[b] (Emergency)	22.26 Disturb (Productivity)
1	20	5	0	5
2 (SW)	0	2	1	0
3	12	4	5	44
4	0	21	2	32
5	0	7	1	0
6	0	0	0	0
7 (AK)	0	21	0	29
8	0	0	0	0
Total	**32**	**60**	**9**[a]	**110**[c]
Estimated Annual Average (6 years)	**5-6**	**10**	**1-2**	**18**

Note: This table includes all reported take with predicted or actual effects on eagle populations and all reported nest take, whether or not there was a loss of productivity. The table does not include other reported take that does not have a population effect (e.g., hazing, salvage of feathers, trap & release, etc.).

[a] *No loss of productivity at four of these nests (eagles used alternate or substitute nest.).*

[b] *Includes nests being built prior to egg-laying.*

[c] *Loss of productivity for one nesting season.*

§22.23 Take of Depredating Eagles

Under these provisions, the Service may issue permits to intentionally take eagles after the Service has determined that the take permit is necessary for the protection of wildlife, agricultural, or other interests in a particular locality. Such take can either be lethal (limited to certain methods) or non-lethal, such as hazing, where the animal's sense of security is disturbed to such an extent that it decides to leave on the area. While hazing may occasionally result in injury to an eagle or meet criteria for a prohibited disturbance, the vast majority of eagles hazed under depredation permits are unharmed. Hazing most often occurs at airports to prevent injury or loss of human life as the result of collision between aircraft and eagles, which also results in the death of the eagles involved in the collision.

Before issuing an eagle depredation permit, the Service must consider: (1) the direct or indirect effect that issuing such permit will likely have upon the wild population of bald or golden eagles; (2) whether there is evidence to show that bald or golden eagles have in fact become seriously injurious to wildlife or to agriculture or other interests in the particular locality to be covered by the permit, and the injury complained of is substantial; and (3) whether the only way to abate the damage caused by the bald or golden eagle is to take some or all of the offending birds. From 2002-2007, an average of 25 golden eagles per year (Table 3.6-1) and 14 bald eagles per year (Table 3.6-2) were permitted to be taken under this section, and that level of take is included in the environmental baseline condition.

Since 2009, permits to haze eagles have dramatically increased, reflecting the growth of bald eagle populations. As the result, the Service now issues dozens of hazing permits to airports across the U.S. Between 2010 and 2015, the Service also issued five permits to trap, relocate, and release bald eagles and five permits to trap, relocate and release golden eagles. However, the Service has not issued any eagle depredation permits for permanent removal of eagles from the wild from 2009-2015.

§22.24 Eagle Falconry

Under the provisions of this section, the Service may authorize the possession and transportation of golden eagles for falconry purposes. Falconers may take only golden eagles that are depredating. A golden eagle may be taken only from a livestock or wildlife depredation area declared by USDA Wildlife Services and permitted under §22.23, or from a livestock depredation area authorized in accordance with Subpart D, Depredation Control Orders on Golden Eagles. From 2002-2007, an average of six golden eagles per year from Service Region 6 (Table 3.6-1) was permitted for falconry purposes, and that level of take is treated as the environmental baseline.

On October 8, 2008, the Service published a final rule in the FR (73 FR 59448) to revise its regulations governing falconry in the U.S. These regulations provided that depredating golden eagles trapped by a government agency may be transferred to permitted falconers if the agency cannot release the eagle to an appropriate location. Because the best data available since 2009 show that additional unmitigated take of golden eagles would lead to population declines, the Service's Mountain-Prairie Regional Office (Region 6) has adopted a policy of requiring all golden eagles trapped for depredation to be released.

§22.25 Take of Golden Eagle Nests for Resource Development and Recovery

Under the provisions of this section, the Service may issue a permit authorizing removal or destruction of inactive golden eagle nests during a resource development or recovery operation if the taking is compatible with the preservation of the area nesting population of golden eagles. For the purposes of the current regulations for this permit, the area nesting population has been defined as the number of pairs of golden eagles known to have a nesting attempt during the preceding twelve months within a ten-mile radius of a golden eagle nest (the “area nesting population” requirement is being replaced under the proposed regulations. An estimated average annual take of six inactive golden eagle nests was authorized under this section between 2002 and 2007 (Table 3.6-1), and that level of take is treated as the environmental baseline condition. There were ten such permits issued for golden eagles from 2010-2015 (Table 3.6-4), all in Region 6 (an average of almost two per year).

3.6.1.2 Eagle Permits Under the ESA

Bald eagles were removed from the federal list of endangered and threatened wildlife in 2007. Prior to the delisting of the bald eagle in 2007, applicants had been including bald eagles in Habitat Conservation Plans (HCPs) that officially granted the permittees ESA authorization and came with assurances of enforcement discretion with regard to the Eagle Act. A few applicants included golden eagles in HCPs as "covered non-listed species”, which provided coverage for golden eagle take under the ESA if golden eagles ever became listed under the ESA. Those permits were also issued with enforcement discretion assurances with regard to the Eagle

Act. In 2008, the Service put regulations in place that officially allow ESA Incidental Take Permits (ITPs) to serve as Eagle Act authorizations (50 CFR 22.11). Now, applicants can receive formal Eagle Act authorization under an ESA ITP when eagles are covered in the HCP. However, no such permits have been approved yet, although several are in progress for bald eagles. Although, there are numerous older existing ESA permits that cover eagles, none have reported any take between 2009 and the present.

Table 3.6-4. Permitted take reported 2010-2015 – golden eagle.

Service Region	22.22 Native American Religious Use—Collect (kill)	22.27 Inactive Nest Removal	22.27 Active Nest Removal (Emergency)	22.25 Nest Take for Resource Recovery Permits
1	0	1	0	0
2	122	0	1	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	23	0	10
7	0	0	0	0
8	0	0	0	0
Total period	**122**	**24**	**1**	**10**
Estimated Annual Average (6 years)	**20**	**4**	**<1**	**1-2**

Note: This table includes all reported take with predicted or actual effects on eagle populations and all reported nest take, whether or not there was a loss of productivity. The table does not include other reported take that does not have a population effect (e.g., hazing, salvage of feathers, trap & release, etc.).

3.6.2 Environmental Consequences

3.6.2.1 Alternative 1: No Action

Under the No Action alternative, none of the proposed or alternative revisions to the Eagle Act would be adopted, and the current management regime would remain in place. The level of OPT – e.g., take authorized under *Sections 22.21, 22.22* (considered in *Section 3.7, Cultural and Religious Issues*), *22.23, 22.24 and 22.25* – would continue to be guided by 2009 take limits. Any new authorized take of golden eagles or new authorized take of bald eagles above EMU thresholds must be at least equally offset by compensatory mitigation (specific conservation actions to replace or offset project-induced losses).

Overall, because eagle populations have sustained existing levels of take, conditions of OPT would be expected to remain the same if the current regulations remained in place. As such, the No Action alternative would likely have no impact on other types of permits to take eagles. Specific recent take data support this conclusion:

- Given that the reported bald eagle take levels from 2010-2015 appear to be consistent with the baseline levels established from 2009 averages (estimated to be seven eggs for scientific collection), the No Action alternative would likely have no impact on this type of take.

- Given that the reported golden eagle take levels from 2010-2015 for inactive nest take (§22.25) are lower than the previous average and the baseline, (six individuals from 2009 averages, two to three from 2010-2015), it appears that continuing the current regulations would not impact this type of take.

3.6.2.2 Impacts Common to All Action Alternatives

The historical levels of OPT from 2002-2007 are considered the baseline conditions affecting eagle populations. Therefore, the impacts analyses on OPT will largely consider the potential effect of the proposal on future above-baseline levels within regulatory permit types. However, if data indicate a continued decline in golden eagle populations that requires active remedial measures, then the Service could reduce the level of POT currently considered baseline.

For all alternatives, in cases where permitted take would exceed the EMU take limit, all take above that limit must be offset by mitigation that would commensurately reduce ongoing mortality from other sources. Since 2009, take limits for golden eagles have been set at zero throughout the United States. Accordingly, all permits for golden eagle take would exceed the take limits and so must incorporate offsetting mitigation. In other words, offsetting compensatory mitigation would be required for all take of golden eagles, such that there is no authorized increase in net anthropogenic mortality (74 FR 46836–46879, Sept. 11, 2009). The effect of this mitigation must be that no net increase in mortality occurs within the EMU where the take is authorized.

The only proposed regulatory changes that specifically apply to OPT are minor revisions to §22.25, including changing the geographic area of evaluation from the area nesting population to the nesting territory. This clarification would not be expected to impact the number of eagle permits granted, including other permitted take.

Because the proposed regulations would not revise any provisions of the regulations for scientific collection, tribal religious use, depredation, falconry, or nest take for resource development or recovery, there would be no direct impacts on other permitted take where average demand for OPT is lower than the baseline allowable take limit.

To analyze the extent to which the proposed and alternative revisions could impact OPT, the following considerations were taken into account and are discussed below:

- How are permit applications prioritized among the various regulatory take categories?
- What is the trend of future demand for types of OPT?
- Can the “supply” of offsetting mitigation match potential increases in demand for OPT?

Authorization of Golden Eagle Take in the Eastern United States

In all the Action Alternatives, the Service would establish an EMU for the golden eagle east of the 100^{th} meridian and allow issuance of permits for golden eagles in the eastern U.S. As in the rest of the EMUs, take levels in the eastern U.S. would also be set at zero unless the take is offset. Therefore, any take of golden eagles east of the 100^{th} meridian would need to be compensated for with offsetting mitigation. There is no baseline level of take for golden eagles east of the 100^{th} meridian.

The establishment of an EMU east of the 100th meridian for golden eagles could encourage permit applications in this new EMU. So, while the number of permits could increase from zero, the establishment of a permitting regime could have a beneficial impact on eagle populations in this region, because activities that currently take golden eagles in the East occur without implementation through permits of conservation measures and mitigation to address impacts to golden eagles. Thus, the establishment of the eastern golden eagle EMU could increase OPT in the region, but, since all take would require offsetting mitigation where none had been done previously, the impact on eagle populations would be beneficial. However, the Service does not anticipate that the benefits of issuing golden eagle take permits in the eastern United States would be great enough to halt potential declines in golden eagle populations. Unless the populations can begin to grow, there would be no effects to other types of permit to take golden eagles.

Prioritization

To address the possibility that demand exceeds the Service's scientifically-based take limits, the final 2009 regulation (74 FR 46386) contains permit issuance criteria to ensure that requests by Native Americans to take eagles from the wild—where the take of live, wild eagles is absolutely necessary to meet the religious purposes of the tribe, as opposed to the use of feathers and parts that may be obtained from the National Eagle Repository (NER)—are given first priority over all other take, except as necessary to alleviate safety emergencies (permit regulations governing take and possession of eagles by Native Americans are set forth in 50 CFR 22.22.) The American Indian Religious Freedom Act (AIRFA, 42 U.S.C. 1996) sets forth federal policy to protect and preserve the inherent right of American Indians to express and exercise their traditional religions, including but not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

If emergency and Native American religious needs can be met, the issuance criteria further provide that programmatic permit renewals are given third priority. Projects to promote and maintain public health and safety have fourth priority. For golden eagle nest take permits, resource development and recovery operations have fifth priority. Assuming those interests are met, bald eagle take for other interests may be permitted as long as total take authorizations do not surpass take limits (74 FR 46386).

Minor revisions are being proposed to the prioritization order. First, third priority for renewal of programmatic permits would be removed. Under all the Action alternatives there would be one permit type only, rather than standard permits and programmatic permits. Second, the priority for Native American Religious Take permits would be clarified as applying only to any increased need for take that exceeds the 2009 baseline for Native American take of eagles. Historical tribal take for religious use requiring take of eagles from the wild that has been ongoing, but not authorized, does not need to be prioritized because it is part of the baseline. Thus, any authorization of previously unauthorized tribal take for religious use would not affect EMU take limits. The minor revisions being proposed are not expected to have any effect on OPT.

Permit Regulation Revisions

The Service anticipates that all the Action Alternatives contain some revised provisions to the eagle incidental take and eagle nest take regulations that would increase permit coverage for eagle take, converting unauthorized existing take to authorized take and securing additional conservation measures for eagles. Those include eliminating ACPs and the criterion currently applicable to programmatic take permits that any authorized take after implementing ACPs is unavoidable. That criterion would be replaced with the standard that take must be reduced to the maximum degree practicable. Also the requirement to use specific protocols for required pre-application surveys would streamline and shorten the permitting process, allowing the Service to issue permits more efficiently. The associated increased conservation measures that would result from issuing more permits would have beneficial effects on both species of eagle. Although these changes would not be significant enough to change the trajectory of golden eagle populations, they could cumulatively result in authorizing increased levels of unmitigated take under other types of take permits in the longer term (once take levels are reassessed and adjusted in the six-year cycle).

Demand for Other Permitted Take

The projected demand for OPT of eagles is an important consideration in analyzing whether that take would be affected by the proposed limits. In the current situation, the baseline take in these categories is greater than the average reported take from 2010-2015, which is indicative of relatively stable demand. The Service's recent data and experience do not indicate increasing demand in the categories of scientific collecting, depredation (except for hazing at airports), or inactive nest take for resource development and recovery. Native American religious use is discussed in *Section 3.7, Cultural and Religious Issues*. Nest take permits required for wind energy development, an area of high expected growth, are primarily covered under section 50 CFR §22.27.

Falconry

With respect to take authorized under 50 CFR §22.24 for take of eagles for falconry, the Eagle Act limits those eagles to depredating golden eagles, which is discussed in *Section 3.6.1*.

In public scoping for this PEIS, comments about falconry were a major theme (see Appendix B). In general, falconers who commented seek to loosen the limitations on the take of depredating golden eagles for falconry. They largely seek to reinstate the program authorizing eagle trapping in depredation areas for falconry and use it as a tool to acquire eagles. In addition, they propose to improve the program by including dangerous wind generation facilities as approved locations for take by falconers, and they would like to increase the authorized number of eagles taken from six per year to the total required or funded by wind energy companies. Falconers also suggested that they could breed and release golden eagles as a compensatory mitigation strategy for take permitted under eagle non-purposeful take permits.

These constituent pressures reveal a potential for increased demand of golden eagle take for falconry. While the Service no longer issues permits for possession of golden eagles for falconry, it retains the authority to issue permits to take depredating eagles, which are the only eagles that may be taken for falconry. However, the trajectory of falconry permits is a separate issue from the regulations being proposed here; the limitations on take of depredating eagles are not the result of these permit regulations, but are based on the status of golden eagle populations and the need to maintain their numbers in the wild.

Resource Development and Recovery

With respect to take authorized under 50 CFR §22.25 for take of eagle nests for resource development and recovery, the baseline take of this type is six (Table 3.6-1) and the average annual take from 2010-2015 was two nests (Table 3.6-4). The Service expects that, with increasing development of energy-related projects (particularly wind resource development), requests for permits to take golden eagle nests for resource development and recovery are likely to increase. These permits are subject to the requirement for offsetting mitigation because of the preservation standard of the Eagle Act, so increased demand could to some degree be accommodated. Hard limits would likely be the result of the need to preserve important nest sites for golden eagles, and not the result of the permit regulations being proposed.

Nest Take

The proposed revisions to nest take permit issuance requirements (50 CFR 22.27) would likely have no impact on other permitted take, because the baseline take level for golden eagle nests (Table 3.6-2) is 10 nests per year, and the average demand from 2010-2015 has been 1-2 (Table 3.6-4), with no evidence suggesting that demand will rise to meet the baseline in the foreseeable future.

3.6.2.3 Alternative 2: Current EMUs, Liberal Take Levels

Take Levels

Bald Eagle

In the liberal take scenario, continuing to use the current eagle management units would not affect OPT. The bald eagle EMU take limits without offsetting compensatory mitigation are set at 8% of population, 4.5% in the Southwest, and 0.7% in Alaska. Applied to the estimated 2009 U.S. bald eagle population (excluding Alaska) of 72,434 (Table 3.2-2), this would yield an annual take limit of 5,772 eagles in the coterminous United States compared to the baseline of 16 bald eagles taken annually from all authorized take from 2002-2007, except Alaska (Table 3.6-2). From 2010-2015, permits for disturbance, active nest removal, and scientific collecting (using the mean number of fledged bald eagles per nest to calculate take resulting from active nest take and disturbance at a nest) resulted in an average annual take of 15 bald eagles and 6 bald eagle eggs per year (Table 3.6-3).

If permits were issued allowing aggregate take up to the proposed liberal level in any given EMU, or in all EMUs combined, and if these take levels were actually reached, then there should be no additional long-term downward pressure on bald eagle populations in any of the EMUs. In other words, this alternative would be able to meet the management objective of providing for stable or increasing bald eagle populations in all of the EMUs over the coming century, assuming that the median 2009 population estimates are accurate and are not overestimates.

Given this, and the fact that recent take history is about equal to the baseline, the limit of 5,795 is highly unlikely to cause any change in the number of permits issued for OPT.

For Alaska, the take limit of 0.7% applies to the estimated population of 70,554 (Table 3.2-2), yielding a take limit of 494 bald eagles (0.7% × 70,554). The baseline take from Alaska is five eagles per year, and the estimated take from 2010–2015 is roughly eight eagles from disturbance, collecting, active and inactive nest removal. Therefore, there is considerable room between the baseline and limit, such that the take limit will not impact other sources of permitted take.

For the Southwest (Pacific Flyway south of the 40th latitude line), the take limit of 4.5%, applied to the estimated population of 447 (Table 3.2-2), would yield a take limit of 20 bald eagles (4.5% × 447). The baseline take from Southwest is zero, and the estimated take from 2010 – 2015 was removal of two inactive nests. Given that there is currently zero unmitigated take of bald eagles in the Southwest, OPT of bald eagles in the southwest would not likely be affected by Alternative 2.

Golden Eagle

Continued use of BCR EMUs as the management unit under Alternative 2 would not affect OPT take levels because it is a continuation of current practice. In the liberal take scenario, the golden eagle take limit is set at zero throughout the United States, without offsetting mitigation. By definition, this leads to a take limit of zero above the baseline level without the requirement for offsetting mitigation, when applied to the estimated golden eagle population of 40,467 (Table 3.3-4). From 2010–2014, permits for golden eagle take, including active nest take and disturbance at a nest, using the mean number of fledged golden eagles per nest to calculate take, translates to an average annual take of 22 golden eagles reported per year, of which 20 were for Native American Religious Use (Table 3.6-4). Given that this recent take history (22 per year) is lower than the baseline (64), it does not appear that a zero limit without offsetting mitigation would impact the number of eagle permits granted for OPT overall.

With respect to take authorized under 50 CFR §22.21 for take of eagles for scientific collection and exhibition, because the prioritization hierarchy in place does not prioritize permits for this use, there could be years when requests for scientific collecting permits that require permanent removal of eagles from the wild cannot be met. However, this seems unlikely to occur since the baseline includes three golden eagles taken annually for this use (Table 3.6-1), but there was no reported take of live eagles for this purpose from 2010–2014 (Table 3.6-4). The Service does not allow live eagles or either species to be taken for exhibition purposes, and none of the numerous research projects permitted under scientific collecting permits that are ongoing or recently completed have required take of live eagles from the wild (other than temporary capture for purposes of banding or marking).

With respect to take authorized under 50 CFR §22.23 for take of depredating eagles, all of the permitted activity in the past six years consists of hazing or trap and release activities. While the permitted activity may temporarily impact individual eagles, it does not result in population impacts at the regional or national scale. The baseline for this type of golden eagle take is 25; reported take from 2010–2015 does not include take with no population effect. Where requests for permits may exceed the number compatible with the preservation of eagles, permits above baseline for permanent removal from the wild of depredating eagles would not be available unless the take can be offset. However, considering the potential for decline in golden eagle populations, and since alternatives to killing golden eagles or retaining them in captivity are available, the Service is unlikely to issue depredation permits that do not require golden eagles to be relocated and released to the wild.

In sum, even under Alternative 2, which, of all the action alternatives, has the least potential to slow the potential decline in golden eagles populations, it is unlikely that permitted take of golden eagles under other permit types would be affected in the foreseeable future.

Permit Regulation Revisions

The effects of the proposed regulations changes in Alternative 2 are described in 3.6.2.2, Impacts Common to All Action Alternatives. However, Alternative 2 would not allow for any compensatory mitigation for incidental eagle take above EMU take limits. The effects of limiting compensatory mitigation to take that exceeds EMU take limits would likely counteract any benefits to bald eagle populations that might accrue through increased permit coverage. The net effect would likely be that there would be no short or long-term effects to OPT from the regulatory changes proposed under Alternative 2.

3.6.2.4 Alternative 3: Current EMUs, Conservative Take Levels

EMUs

The effects of maintaining the current EMU configurations under Alternative 3 are the same as those discussed in *Section 3.6.2.3* for Alternative 2 (i.e., no effect on OPT).

Take Levels

Bald Eagles

Alternative 3 would allow for more growth of bald eagle populations than Alternative 2; comparable to the effects of Alternative 1. Based on the effects analysis for bald eagles in 3.2.2, the bald eagle take limits would allow for take of up to 3,742 bald eagles in the lower 48 states above the baseline of 16 bald eagles taken annually from 2002–2007. The only region where the more conservative take levels could affect OPT of bald eagles is in the southwest. However, the revisions to the eagle incidental take permit regulations proposed under Alternative 3 (see below) would likely result in implementation of more conservation measures, resulting in a higher level of bald eagle population growth than under Alternative 2. Higher population numbers would allow the Service to adjust unmitigated take levels upward when the Service revises take limits at six-year intervals. The result would be that, even in the southwestern EMU, higher take levels are likely to keep pace with any expected increase in demand for OPT, and so not affect OPT.

Given that the take history from 2010-2015 is about equal to the baseline, the limit of 3,742 is unlikely to cause any change in the number of permits issued for OPT

In Alaska, the allowable take level for bald eagles would be 494 bald eagles The baseline take from Alaska is five eagles per year, and the estimated take from 2010-2015 is roughly eight eagles from disturbance, collecting, active and inactive nest removal. Therefore, the considerable difference between the baseline and take limit would not affect other sources of permitted take.

Golden Eagles

Take limits would be zero above baseline for golden eagles. The analysis here for Alternative 3 is the same as for golden eagles in *Section 3.6.2.3* for Alternative 2; all take above baseline must be compensated by mitigation.

Permit Regulation Revisions

Maximum permit duration under Alternative 3 would be 30 years. To the extent that the availability of longer-term permits increases annual demand, this could affect the number of permits that are available for OPT. This could occur if the change in maximum duration itself encourages more permit applications, owing to the greater certainty of maintaining a long-term permit. Assuming the prioritization of permits does not change, this would not affect Native American religious use permits, discussed in *Section 3.7, Cultural and Religious Issues*, but it could affect scientific collecting, or depredation permits for bald eagles, which are prioritized at the same level as incidental take permits. However, the extended permit duration (with its accompanying increase in permit demand and coverage and associated conservation measures), along with additional compensatory mitigation requirements under Alternative 3, is likely to have beneficial effects on eagles. For bald eagles, any effects to OPT of an increased demand for bald eagle permits would be positive.

As noted in the discussion of take levels, there is still room under the baseline to accommodate the level of recent permit demand from 2010-2014 (Tables 3.6-3 and 3.6-4); however, if higher levels of demand for OPT grow to exceed the baseline, and the demand for incidental take is increased by the extension of permit durations to 30 years, then OPT could be reduced. This is not likely, however, because, as also noted above, there is no current data to suggest that demand for OPT would rise over baseline in the foreseeable future. Thus, take levels would be unlikely to be reached for bald eagles (except in the SW), and once they were, all take under §22.26 and §22.27 would have to be offset.

For other permit provisions, the analysis for 3.6.2.2, Impacts Common to All Action Alternatives applies to Alternative 3.

3.6.2.5 Alternative 4: Flyway EMUs, Liberal Take Levels

Flyway EMUs

Under this alternative, the Service would use the flyways as the EMUs for both species. Use of flyways as EMUs is expected to have subtle benefits to eagle populations because mitigation would be targeted on eagles from populations that experience the permitted take. However, those effects would be minor and not expected to have any effect on OPT, particularly since OPT is not expected to change significantly in the foreseeable future.

Under this alternative and Alternative 5, "compatible with the preservation of eagles" would be defined as "consistent with the goals of maintaining stable or increasing breeding populations in all eagle management units and persistence of local populations throughout the geographic range of both species."

Take Levels

Bald and Golden Eagles

The impacts of "liberal" take levels analyzed for Alternative 2 apply to the same levels proposed here in Alternative 4, for both bald and golden eagles.

Permit Regulation Revisions

The analysis for the Impacts Common to All Action Alternatives and Alternative 2 applies here. Under this alternative, the LAP cumulative effects analysis would be incorporated into the regulations and the preservation standard would be modified to include maintaining the persistence of local eagle populations throughout their range. However, the modified eagle preservation standard and codification of the LAP analysis are not expected to substantively change the number of permits issued. Thus, there would be no adverse impacts to OPT because the conditions that could cause reductions to OPT (lower limits, greater demand) would not be triggered. Even if these two regulatory changes were to result in fewer permits, the conditions under which OPT could be reduced would not be reached. In sum, the regulatory components of Alternative 4 are not likely to affect OPT.

3.6.2.6 Alternative 5: Flyway EMUs, Conservative Take Levels (Preferred Alternative)

Flyway EMUs

The analysis for Alternative 4 in *Section 3.6.2.5* applies here for Alternative 5.

Take Levels

The analysis of take levels for Alternative 3 in *Section 3.6.2.4* applies here for Alternative 5 for both bald and golden eagles.

Permit Regulation Revisions

The effects from the proposed rule changes in Alternative 5 would be those discussed under Impacts Common to All Action Alternatives in *Section 3.6.2.2* as well as the effects of extending the maximum permit duration discussed in Alternative 3, *Section 3.6.2.4*. The only significant difference is how eagles, and thus other permitted take of eagles, would be affected by the compensatory mitigation requirements of Alternative 5.

Mitigation

Alternative 5 and Alternative 3 have the most beneficial compensatory mitigation requirements for golden eagles. The benefits in Alternative 3 are the result of a minimum level of compensatory mitigation that would be required for every incidental take permit, over and above compensatory mitigation required for take that would exceed take limits. Under Alternative 5, the benefit would be the result of the greater than one-to-one compensatory mitigation ratio required for take that would exceed EMU take limits. The compensatory mitigation benefits of Alternative 3 would also apply to bald eagles, but the greater than one-to-one compensatory mitigation ratio in Alternative 5 would not. This enhanced mitigation for golden eagles under Alternative 5 is expected to provide a higher likelihood of achieving the Service’s eagle management objective. The enhanced mitigation for golden eagles could lead to a reevaluation of take limits, thereby easing any prior impacts on OPT if over time demand for OPT moves closer to the existing baseline.

However, as with the other alternatives, Alternative 5 is not likely to affect OPT in the foreseeable future.

Summary

Assuming relatively stable demand for OPT and continuation of current eagle population trends, it is unlikely that the proposed rule revisions would affect the availability of OPT permits because the baseline take would be sufficient to meet historic demand.

3.7 Cultural and Religious Issues

3.7.1 Affected Environment

The way that cultural interaction takes place depends on the uniquely human capacity to use complex symbolic representation in the expression of meaning (Lamendella, 1980). Ritual behavior is the quintessential form of symbolic expression through largely nonverbal action and is often used to strengthen the social structures of society. Symbolism is the smallest unit of ritual which still retains the specific properties of ritual behavior. Symbols are, therefore, a special way to convey meaning (Bloch, 1980). Ritual rarely addresses trivial issues and is often directed to solve problems where the outcome has great uncertainty (e.g., life, prosperity, war, etc.) (Laughlin and Stephens, 1980). As such, ritual, and the symbols employed, can be essential to the well-being of humans and the culture(s) in which they interact by providing a sense of meaning and purpose to their lives.

Symbolism in U.S. History

The U.S. Congress chose the bald eagle to be depicted on the official seal of the U.S., selecting it over both the originally-proposed golden eagle because the golden eagle was also found in Europe, and more famously, the wild turkey. The original seal depicted an eagle with its wings outspread, an olive branch in one talon and arrows in the other and a scroll inscribed with the Latin words, *E Pluribus Unum* (Out of many, one). The emblem has changed only slightly in 200 years and appears on the national and President’s seal; the mace of the House of Representatives; on currency and coins; and is used by various military units (Lawrence, 1990). As the nation’s symbol, the bald eagle represents U.S. citizens’ sense of autonomy, courage, and power. Today, bald eagle imagery is ubiquitous in American culture and society, attesting its widespread symbolic importance (USFWS, 2007d).

More recently, the bald eagle has also come to symbolize America's conservation history. The fluctuation of its population reflects the ecological footprint of people on this continent: the bald eagle was abundant prior to colonialism; declined during the westward expansion of American frontier and the Industrial Revolution; then nearly became extinct due to expansive use of chemical pesticides during the post-World War II economic expansion; only to recover as the nation's growing ecological awareness led to increased ban on DDT use in the U.S. and the passage of environmental laws such as NEPA and the ESA. For many Americans, the bald eagle symbolizes the ecological consciousness of society and the health of the environment (USFWS, 2007d).

Native American Symbolism

In North American pre-history, the symbolic importance of eagles is evident. The Fort Ancient people, a mound- building culture in Ohio, included the beak of an immature golden eagle in the grave goods of the burial site (~1500AD) of a male, perhaps signifying status (Brady-Rawlins, 2007). The presence of wing bones for golden eagles and bald eagles in excavations of mounds in Illinois is cited as indication that the eagles may have been killed for their plumage and used in ceremonial functions (Parmalee, 1958). Other research in Iowa revealed an assemblage of more than 260 broken and splintered lower legs of raptors, including eagles, which may have been evidence of trade in ceremonial birds (Fishel, 1997). The use of eagles in tribal ceremonies in central California was ascertained by archaeological excavations revealing their bones as burial objects in three cultural horizons. One notable find was an eagle skull with an abalone ornament over one eye (Heizer and Hewes, 1940).

Bald eagles and golden eagles remain sacred to many American Indian tribes and tribal members and are central to the religious practices of some tribal cultures in North America and other localities throughout the species' range. American Indian interests are unique and unlike any other interests due to the status of federally-recognized tribes as governmental sovereigns, as well as the unique relationship between the U.S. government and each tribe. There exists a separate federal trust responsibility to tribes, which among many other things, safeguards indigenous religious practices, cultural practices, places, sites, and objects. Moreover, the Eagle Act specifically carves out an exception allowing the Service to authorize take of bald and golden eagles for the "religious purposes of Indian Tribes."

3.7.1.1 Federal and Tribal Statutes

National Historic Preservation Act of 1966, as amended (NHPA) (54 U.S.C. 300101 et seq.)

Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties. Federal agencies accomplish this by following the Section 106 regulations, "Protection of Historic Properties" (36 CFR Part 800). The Section 106 regulations set forth a process by which agencies: (1) evaluate the effects of any federal undertaking on historic properties (properties included in, or eligible for inclusion in, the NRHP (National Register)); (2) consult with State Historic Preservation Officers (SHPOs), Tribal Historic Preservation Officers (THPOs), and other appropriate consulting parties regarding the identification and evaluation of historic properties, assessment of effects on historic properties, and the resolution of adverse effects; and (3) consult with appropriate American Indian tribes (tribes) and Native Hawaiian Organizations (NHOs) to determine whether they have concerns about historic properties of religious and cultural significance in areas of these federal undertakings. Issuing a permit to a third party is generally considered a federal undertaking.

American Indian Religious Freedom Act (AIRFA) (42 U.S.C. 1996)

AIRFA sets forth federal policy to protect and preserve the inherent right of American Indians to express and exercise their traditional religions, including but not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites. To address the possibility that demand exceeds the scientifically-based take limits, the 2009 regulation contains permit issuance criteria to ensure that requests by Native Americans to take eagles from the wild, where the take is necessary to meet the religious purposes of the tribe, will be given first priority over all other take except, as necessary, to alleviate safety emergencies. The proposed rule would make minor changes to the permit issuance criteria included in the 2009 regulation, but Eagle American Indian Religious Take (EAIRT) permits (above historical baseline) will continue to be given first priority over all other take except, as necessary, to alleviate safety emergencies.

Morton Policy and Department of Justice Memorandum

The 1975 Morton policy statement provides Native Americans protection from Federal prosecution, harassment, or other interference to "…possess, carry, use, wear, give, loan, or exchange among other American Indians, without compensation, all federally protected birds, as well as their parts or feathers (DOI, 1975)."

The Department of Justice (DOJ) memorandum issued in 2012 formalizes and memorializes the longstanding (Morton) policy; and serves to eliminate uncertainty and concern regarding enforcement of federal bird protection laws as they relate to the cultural and religious activities of federally recognized tribes and their members. Specifically, the DOJ memorandum clarified that members of federally recognized tribes may acquire from the wild, without compensation of any kind, naturally molted or fallen feathers of federally protected birds without molesting or disturbing such birds or their nests. No commercial trade of feathers or collection of eagle remains is allowed. The Service issues permits for receipt and possession of whole eagles, eagle feathers, and eagle parts to tribal members who apply for and receive such items through the NER (DOJ, 2012). See *Section 3.7.1.3, Permits for Indian Religious Purposes* for a detailed discussion of permits for Indian religious purposes and the NER.

Traditional Cultural Properties

Some tribes and tribal members may consider eagle nests sacred sites, as provided for in the AIRFA, and a Traditional Cultural Property (TCP) under the NHPA. A TCP is a potential historic property of religious and cultural importance. Such sites are not limited to currently-recognized Indian lands, and they occur across the entire aboriginal settlement area. Properties of religious and cultural importance may be areas where eagles nest and have nested within living memory, their presence becoming a contributing element for determining eligibility under NHPA (King, 2006; Tanji, 2008). Thus, a landform or landscape known for eagle habitation – a ridgeline, canyon, lakeshore, river valley, mesa, mountain, etc. – may be considered by tribes as suitable for designation as a property of religious or cultural importance.

Archaeological sites may be considered TCPs by many tribes, depending on which ceremonialist one consults. The Navajo provide a good example. Navajo ceremonialists (*hataaii*) may determine which sites are TCPs. These TCPs include sites that may have been blessed or where ceremonies (*náádahaghaahgóó*) may have occurred. These can be associated with, among other types of sites, eagle traps. Eagle trapping sites (*ood*) are places where eagles were captured for ceremonial use, and would be considered a "Gathering Place." Cultural resource surveys are likely to detect sites with material evidence of human use at archaeological sites. Eagle traps and sites where ceremonies may have occurred are likely to have visible evidence, such as the remains of ceremonial structures (Navajo Nation HPD, 2002).

For example, Mount Taylor TCP was determined to be eligible for listing on the NRHP in 2008. The Pueblos of Acoma, Zuni, Laguna, Jemez, Isleta, the Hopi Tribe, the Navajo Nation, and the Jicarilla Apache Nation all view Mount Taylor as a living, breathing entity that embodies a spiritual essence. Part of the San Mateo Mountains in New Mexico, Mount Taylor is a place where traditional practitioners go to conduct traditional cultural and religious activities. Over time, these have included, but are not limited to the collection of plants, stones, minerals, pigments, soil, sand, and feathers; catching eagles; hunting game and birds; pilgrimages to place offerings; and visiting shrines and springs. The Jemez tradition prescribes that the individuals visit the shrine(s) near the top of the mountain to leave offerings, and then proceed to prescribed areas lower on the mountain and its mesas to catch the eagles (USFS, 2008).

Because an eagle or eagle nest may constitute or be considered a contributing feature or element of a property of religious or cultural importance or sacred site, issuance of an eagle permit could constitute an undertaking requiring compliance with Section 106 of the NHPA if that site is within the area of potential effect of the permitted project. Section 106 compliance may require government-to-government consultation with tribes. Each Regional Permit Office coordinates with the Service Regional Historic Preservation Officer to ensure necessary NHPA consultations take place with the appropriate parties, which can include the cultural preservation officer for any affected tribe. The Service complies with Section 106 on a case-by-case basis for permits that have the potential to affect historic properties. If it is determined to be more efficient for all parties, the Service may also consult with appropriate stakeholders to develop state or regional Programmatic Agreements that will govern and resolve the compliance with NHPA for the issuance of permits to take in specific states or regions.

A search of the database of historic properties listed (or eligible for inclusion) on the NRHP yielded 29 sites that may be associated with eagle habitat and that are likely to be considered properties of religious and cultural significance by Indian tribes (Table 3.7-1). This list is considered far from comprehensive, but is included primarily to illustrate the types of sites associated with eagles and eagle nests. Some sites with religious and cultural significance may not have completed the evaluation process for listing on the National Register, or tribes may not have initiated the process. According to the Section 106 regulations, a property is considered an historic property if it is listed on, or eligible for (emphasis added) listing on, the National Register. Thus, a lack of formal listing does not lessen the need to consider a property;

instead, it emphasizes the need for close coordination with appropriate parties at the project planning stage.

Tribal Statutes

Three tribes explicitly list the bald and/or golden eagle as threatened or endangered: the Nez Perce Nation, the Navajo Nation, and the Mille Lacs Band of the Ojibwe. Nineteen other tribes stipulated protection of the bald and/or golden eagle; these are indicated as “Other Protected” in Table 3.7-2. “Other Protected” indicates that the tribal code, constitution, etc. contains language similar to that of the Eagle Act, ESA, or MBTA.

The information provided in Table 3.7-2 is not comprehensive, but represents the information obtained from an online literature search of tribal policies, codes, constitutions, and resource-management documents; and reflects the most recent information available. That said, it should be noted that all were published in or before 2008. As such, tribes may or may not have updated the status for either eagle since 2008. Some tribes may have laws protecting eagles that are not published or otherwise publicly available. This table will be updated in the final PEIS if any such information becomes available through the public comment process, tribal consultation, or through other means.

Nothing in the proposed eagle rule revision would prohibit individual tribes from protecting either eagle species under tribal law. Nor would the proposed eagle rule revision prohibit tribes from developing more stringent protection for either species.

Notably, the Navajo’s 2008 Endangered Species List added the golden eagle as threatened and the bald eagle as endangered (one year after it was delisted from the federal endangered species list). The Navajo Nation Golden and Bald Eagle Nest Protection Regulations are designed to establish circular buffers around all eagle nests on the Navajo Nation; protect nesting eagles, their eggs and young from human activities within those buffers during the breeding season; and designate the types of permanent structures that may be constructed within those buffers. The Navajo National Golden and Bald Eagle Nest Protection Regulations were published simultaneously (NNDFW, 2008a; NNDFW, 2008b).

3.7.1.2 Native American Religious and Cultural Uses of Eagles and Eagle Parts

Eagles have a special spiritual significance for many, but not all, American Indian cultures. Eagles and eagle parts are used in a variety of Native American religious and cultural ceremonies, including baptismal, womanhood, marriage, burial, healing, and seasonal ceremonies which are intrinsically tied to Native American spiritual beliefs. In some cultures the spirit or soul of the eagle might visit a person during a vision quest; in others, eagle medicine is associated with war and the wearing of eagle feathers symbolized war honors; and in still others the ceremonial use of eagles blesses the participants and their families and results in good health and a constructive life (DeMeo, 1995).

Table 3.7-1. Sites listed on the NRHP and TCPs associated with Native American tribes in eagle habitat (2015).

State	County	Resource Name	Tribal Affiliation
California	San Diego	*Kuchamaa* (Tecate Peak) TCP	Kumeyaay
California	Riverside	Tahquitz Canyon TCP	Cahuilla
California	Inyo	Coso Hot Springs TCP	Not identified
California	Humboldt	De-No-To Cultural District TCP	Not identified
California	Del Norte	Mus-yeh-sait-neh Village and Cultural Landscape Property TCP	Not identified
Nevada	Spring Valley	Swamp Cedar Area TCP*	Shoshone, Gushute
Arizona	La Paz	Eagletail Petroglyph Site	Yavapai and Maricopa
Arizona	Pima	I'itoi Mo'o (Montezuma's Head) and 'Oks Daha (Old Woman Sitting) TCP	Tohono O'odham
Arizona	Pima	Pascua Cultural Plaza TCP	Yoeme
Arizona	Apache	Canyon de Chelly	Navajo
Massachusetts	Nantucket	Nantucket Sound TCP*	Mashpee Wampanoag Tribe, Wampanoag Tribe of Gay Head (Aquinnah)
Montana	Lewis and Clark	Eagle's Site	Not identified
Montana	Big Horn	Annashisee lisaxpuatahcheeaashisee (Medicine Wheel on the Big Horn River) TCP	Arapaho, Crow Nation, Nez Perce
South Dakota	Meade	Bear Butte	Sioux, Cheyenne
Oklahoma	Delaware	Basset Grove Ceremonial Grounds TCP	Seneca, Cayuga
Oklahoma	Kay	White Eagle Park	Ponca Nation of Oklahoma
Nebraska	Saunders	Pahuk	Pawnee, Omaha
New Mexico	McKinley, Cibola	Mount Taylor TCP*	The Pueblos of Acoma, Zuni, Laguna, Jemez, Isleta; the Hopi Tribe; the Navajo Nation; the Jicarilla Apache Nation
Arizona	Cococino	Red Butte TCP*	Havasupai, Hopi

State	County	Resource Name	Tribal Affiliation
Nebraska	Holt	Eagle Creek Archaeological Site	Not identified
Nebraska	Sioux	Agate Fossil Beds National Monument	Cheyenne, Lakota
Wyoming	Crook	Inyan Karan Mountain	Sioux, Cheyenne
Oregon	Curry	Eagle Rock	Not identified
Wisconsin	Grant	Eagle Valley Mound District	Not identified
Wisconsin	Richland	Clipped Wing Eagle Mound	Not identified
Wisconsin	Richland	Eagle Township Mound Group	Not identified
Wisconsin	Richland	Hunting Eagle Mound	Not identified
Wisconsin	Jackson	Black Hawk Powwow Grounds TCP	Ho-Chunk
Minnesota	Scott	Ma-ka Yu-so-ta (Boiling Springs) TCP	Dakotah, Sioux

Source: NRHP, 2015

**Eligible for inclusion on the NRHP*

Table 3.7-2. Tribal status for bald eagles and golden eagles (2015).

Tribal Entity	Location(s)	Bald Eagle	Golden Eagle
Swinomish Tribe	Washington	Other Protected	Other Protected
Jamestown Tribe S'Klallam	Washington	Other Protected	Other Protected
Spokane Tribe of Indians	Washington	Other Protected	Other Protected
Nez Perce Nation	Idaho	Endangered	Unknown
Warm Springs Tribe	Oregon	Other Protected	Other Protected
Navajo Nation	New Mexico	Endangered	Threatened
Chickasaw Nation	Oklahoma	Other Protected	Other Protected
Citizen Potawatomi Nation of Oklahoma	Oklahoma	Other Protected	Other Protected
Sault Ste. Marie Tribe of the Chippewa	Michigan	Other Protected	Other Protected
Mille Lacs Band of the Ojibwe	Minnesota	Endangered	Endangered
White Earth Band of the Ojibwe (Chippewa Indians)	Minnesota	Other Protected	Other Protected
Lac du Flambeau Band of Lake Superior Chippewa Indians	Wisconsin	Other Protected	Other Protected
Stockbridge-Munsee Band – Mohican Nation	Wisconsin	Other Protected	Other Protected
Red Lake Band of Chippewa Indians	Minnesota	Other Protected	Other Protected
Oglala Sioux Tribe	South Dakota	Other Protected	Other Protected
Spirit Lake Tribe	North Dakota	Other Protected	Other Protected
Eastern Band of Cherokee	North Carolina	Other Protected	Unknown
Oneida Nation of New York	New York	Other Protected	Other Protected
Seneca Nation of Indians	New York	Other Protected	Unknown
Gros Ventre and Assiniboine Tribes of Fort Belknap	Montana	Other Protected	Other Protected
Crow Tribe of Montana	Montana	Other Protected	Other Protected
Fort Peck Tribes – Assiniboine & Sioux	Montana	Other Protected	Other Protected
Blackfeet Nation	Montana	Other Protected	Other Protected

Other Protected – Includes statutes specifically prohibiting take of migratory birds, eagles, and/or raptors; and deferment to federal protections including the Eagle Act or the MBTA. Some documents dating before 2007 also cite the ESA.

Unknown – Federal or tribal protection unknown.

Below are some of the ways in which the eagle was traditionally incorporated into Native American cultures, especially as it relates to capturing or killing eagles. The descriptions of the eagle's significance for particular tribes included in this section are based on information available after an extensive online literature review. These descriptions serve to explain a range of historic American Indian uses of eagles and eagle parts for the purpose of this PEIS and in no way encompass all the ways in which the eagle is relevant in American Indian culture.

To most Native Americans, killing an eagle is expressly forbidden; as is eating its meat. Eagle feathers for ceremonies must be obtained without harming the bird or its ability to fly. Because this task is difficult, it is sacred and often described as an honor or a "ritual ordeal." After obtaining the necessary feathers from live eagles, Native Americans often set the eagles free. Many other Native American traditional practitioners only use eagle parts and feathers salvaged from dead eagles and do not kill eagles for religious purposes (DeMeo, 1995).

The attitude of veneration toward the eagle and the belief in its sacred character has been noted among the Hidatsa, Blackfoot, Cheyenne, and Pawnee where eagle trapping appears to have been a ceremonial function (Wilson, 1929). Among the Cherokee, eagle killing was a tribal affair preliminary to the Eagle Dance and the bird was believed to be sacred (Mooney, 1900). For several Plain and Southwest Indians, the ideal (and more plentiful) prize was the immature golden eagle with its distinctive tail feathers: white with black tips. Mature golden eagles were often ignored for this reason. The golden eagle played a greater role than the bald eagle in the native ceremonial life of these tribes, partly owing to feather preference, but also because bald eagles were historically scarcer in these areas.

Securing eaglets before they leave the nest and rearing them in captivity is reported for the Miwok Indians and also among certain tribes in Southern California. In some cases, the birds were released after a time. In others, eagles were sometimes killed or sacrificed according to ritual. Among the Luiseno, the mourning period for the dead ended with the ceremonial killing of the eagle (i.e., the Eagle Ceremony); the eagle is one of the representatives of the spirit world who is connected with the spirits of the dead (Hardy, 2000).

Plain and Plateau Indians – Cheyenne, Hidatsa, Sioux, Lakota, Blackfoot, Gros Ventre

The gift of an eagle feather still denotes respect and gratitude or marks an important life transition. Currently, many young people are awarded eagle feathers upon graduation from high school. The Lakota and Ute also employ eagle bone whistles made from the leg or wing, and are played continuously by the dancers during the Sun Dance (Harvard, 2008).

The golden eagle is particularly associated with warriors and courage in battle among the Plain Indians. Golden eagle feathers were used to symbolize warrior prowess; given to warriors after what was considered to be a brave act; and were received only after intense preparation and fasting (Harvard, 2008). The feathers earned as war honors were worn in war bonnets, headdresses, or belts by the Omaha, Western Sioux, Lakota, and Cheyenne (Watson, 2010; Johnson, 2000). Tail feathers of at least five juvenile golden eagles were used in making one Western Sioux war bonnet (Watson, 2010). Eagle feather fans are also commonly used in Lakota ceremonies in conjunction with sage smoke to bless individuals and actions as well as to give thanks to the Creator. In some tribes today, eagle feathers are given to soldiers returning from war as a symbol of extraordinary bravery and courage (DeMeo, 1995; Ojibwa, 2012).

Golden eagle feathers were also used by the Blackfoot Tribe to construct prayer sticks and to adorn doctors' rattles and medicine pipes. Eagle heads appeared on the stems of sacred pipes, regarded as powerful medicine for curing disease and praying for prosperity. The ceremonial tribes pipes of the Blackfoot Tribe 'were perhaps the most spectacular creations of all the sacred Plains pipes'; few were made, and in one case the stem was almost covered with a whole eagle (Mails, 1991). Similar to the Lakota, eagle-bone whistles that replicated the screech of an eagle were often blown during tribal rituals (Watson, 2010).

Among the Cheyenne, golden eagles were the property of priests and used by war doctors to treat disease and injury (Watson, 2010). The only men who hunted eagles were old men who had proven themselves worthy to hunt eagles or men who had ceased going on the warpath.

Eagle hunters had to carry out a lengthy, complicated "apology" ritual beforehand to soothe the bird's spirit and then trick the eagle into coming close enough for them to grab it with their bare hands. On the top of a hill, the hunter would dig a pit about four feet deep and cover it with poles, twigs, and grass. A dead rabbit or other small mammal would be placed on top as bait. The hunter would then enter the pit and hide until the eagle swooped down to take the meat. Then the hunter would grab the eagle by both feet, pull it into the pit, and wring its neck (Ojibwa, 2012; Watson, 2010).

In the Hidatsa Tribe (now part of the Three Affiliated Tribes of the Fort Berthold Reservation in North Dakota), the ceremonies associated with pit-trapping were many and complex. The purpose of these rituals was to placate the eagle spirit, and presumably to increase the chance of a successful hunt. They included the construction of hunting lodges, the offering up of prayers and burning of incense (for purification and to mask the hunter's scent), and strict customs related to the selection and preparation of baits, among many others.

The feet and wings of captured eagles were tied and carried to the camp. If only one or two eagles were caught, they might be released after the tail feathers had been plucked. If a larger number were caught, some of them would be killed for the wings to make fans and plume arrows. Three eagle tails yielded enough feathers to make one good warbonnet, or *maicumapuka* (Wilson, 1929).

California and Great Basin – Northern Arapaho, Eastern & Western Shoshone, Ute, Luiseno, Miwok, Chumash

The Wind River Reservation in Wyoming has been shared by the Northern Arapaho Tribe (NAT) and the Eastern Shoshone Tribe (EST) since its creation in 1868. The two tribes, however, differ on the relationship between eagles and traditional culture and religion, as demonstrated in a recent case with roots in a decade-old killing of a bald eagle by a NAT member for use in a tribal ceremony.

The NAT kill eagles for its annual Sun Dance. Similar to the Cheyenne, eagles were historically caught by a man concealed in a pit covered with brush, on which meat was placed. Only certain men could hunt the eagle; and for four days they abstained from food and water. In four days they might get 50 or 100 eagles (Wilson, 1929). Sponsorship to kill an eagle is both an honor and a responsibility and for the sponsors' relatives, this is a communal obligation. The eagle must be pure: It cannot have died through poison, disease, accident or electrocution (10th Cir., 2008; Ojibwa, 2012).

The NAT applied for an eagle take permit under the Eagle Act to allow the taking of two eagles within Freemont County, Wyoming, Wind River Reservation. The EST submitted a letter opposing the application on grounds that the EST considered eagles to be sacred. The Service issued the challenged permit to the NAT in 2012, allowing the take of up to two bald eagles but limited the geographic area in which the permit applied to outside the Reservation. Limiting the take to areas outside the Reservation was considered necessary to protect the EST's religion and culture.

The Southern Ute Sun Dance is central to the Ute's religious organization. While originating from and similar to the Arapaho and Cheyenne Sun Dances, instead of marking the beginning of summer buffalo hunts, the object of the Ute's Sun Dance is primarily to attain a shaman's powers and secondarily to cure the sick. The eagle-bone whistle, made of eagle shin-bone, is a standard article tied around the neck and held between the teeth while dancing. The eagle-tail fan is used by Ute shamans to drive illness away. Most of the dancers tied downy eagle feathers to the little finger of each hand (Opler, 1941). The Ute Mountain people placed eagle traps on the summit of high peaks in order to obtain feathers for various ceremonies.

Golden and bald eagles figure prominently in Western Shoshone mythology as messengers to and from the creator, the eagle itself is considered an extremely powerful spiritual being. Feathers were (and are) used by Indian doctors (shamans), usually as part of the healing ritual, as they are said to contain great amounts of healing strength or "medicine" (BLM, 2001). The traditional means of trapping and keeping eagles for their feathers included climbing cliffs to capture and rear the young or various means of luring adult birds with bait; these birds were usually eventually released. Most accounts emphasize the special power required to climb to the aeries and that aeries usually were considered the property of the men (Steward, 1938).

The Eagle Ceremony marked the end of the period of mourning for the Luiseno, where an eagle was killed. The ceremony included singing and dancing around a fire holding the eagle. *Ashwut maknash*, eagle killing, was the Luiseno mourning ceremony for a chief. An eaglet was taken from its nest and raised by the chief. When the chief died, the successor held a ceremony that included killing the eagle, and offering it along with property to another chief; who then burned it (DuBois, 1908).

Archaeological evidence (eagle skulls with abalone eye ornaments) in the San Joaquin Valley illustrates the strong connection of the Miwok to the eagle. The nesting places of eagles belonged to the chiefs of certain lineages. The Miwok sometimes captured and kept young eagles so that their feathers might be used for dance regalia, especially the *wokile* dance. The eagle was believed to be endowed with supernatural power or mana *(alini)* and if the proper offerings were not made the eagle catcher might meet misfortune. As such, only a man who knew how to handle the birds would undertake their capture. They were usually taken from the nest when about ready to fly. Two cradles of eaglets were taken from the aerie, bound and carried on the hunter's back like human infants (Gifford, 1926).

Among the Chumash, condors and eagles both played a part in cosmic events and were sacrificed based on which celestial body was prominently visible at the time of the ceremony. Eagles were selected for rituals concerned with the Evening Star (Venus), while condors were chosen for rituals associated with the planet Mars. Most experts have concluded that California condors held a unique place in the ceremonial life of Californian natives, and that eagles were used more commonly during the period when condor populations declined (Foster, 2015). Historical Chumash and Diegueno traditions, since lost, included the sacrifice of an eagle (or, rarely, a condor) at the winter solstice, when the year is at its shortest and the sun closest to its death, in an effort to save their own demise (McNamee, 1996).

California and Pacific Northwest – Kootenai, Pend d'Oreilles/Kalispel, Cahuilla, Nez Perce

The Kootenai hunted eagles similar to the Cheyenne, as described above. The Pend d'Oreilles and Kalispel also sought bald and golden eagles for their feathers. The young golden eagle feather was the most prized because of its black tip. The tail feathers were secured from the eaglets before they left the nest. In certain locations eagles were shot with the bow (Sturtevant and Ortiz, 1983).

The Nez Perce took eagles from the nest while young and raised them in camp. The first set of feathers was plucked, and a part of the second set; then the birds were set free (Wilson, 1929). They also caught eagles in pits as did the Hidatsa, except that two hunters were always present (Spinden, 1908).

Among the Cahuilla in California, the eagle lived forever and by permitting itself to be killed by people it assured them of life after death. Eagles' nests were closely watched and a feast was held when the eggs were laid. When the birds were well-feathered, one would be removed and raised in a cage. When the bird was grown, the Eagle-Killing Ceremony would be held. This included singing songs about the death of eagles and dancing with the eagle (Ojibwa, 2012).

Southwestern – Navajo, Hopi, Zuni

In Navajo tradition, because eagles fly nearer to the sun and the heavens than mere humans, eagles deliver their prayers to the Creator. Eagles are, in essence, prayer messengers. Navajo people use eagle feathers to celebrate an accomplishment, to protect themselves from harm and to pray, or to cure physical and emotional disorders (e.g., as part of *Ana'í Ndáá'* or the Squaw Dance). Eagle feathers are highly prized and a lot more sacred than other feathers. According to the Franciscan Fathers, Navajo eagle trapping was accompanied by song and prayer. The eagle was caught by its feet and neck; the beak was filed with a stone, and the down and tail feathers were plucked. Later the birds were released (Wilson, 1929). When plucking sacred feathers from live eagles, one may never take more than will permit the eagle to continue to fly (DeMeo, 1995).

For centuries, the gathering of live young eagles has been a fundamental aspect of Hopi religious life. Eagle gathering is conducted annually in the spring from a specific set of sacred nest sites. Preliminary trips to check on the eagle nests are made; eaglets are then gathered live when they are at the appropriate age. Offerings are made at eagle shrines within the gathering areas, and the eaglets are transported back to the Hopi villages where they are cared for as members of the clan of the eagle gatherers until midsummer when they are "sacrificed" and buried in an eagle cemetery (Watson, 2010; DeMeo, 1995). The Service has issued an annual permit to the Hopi every year since 1987 allowing the take of up to 40 golden eagles per year. Reported take by the Hopi has never exceeded 38 golden eagles per year, and has averaged 23 golden eagles per year with the actual number taken varying with annual productivity. The Hopi take all available young from a specific set of sacred nest sites, and do not expand their collections in poor reproduction years to other nests to increase the collection.

The Zuni Tribe uses eagle and other migratory bird feathers each month at their sacred sites as one time offerings in the form of "prayer sticks." Once offered, the feathers are neither retrieved nor replaced, but are left to be naturally "planted into the Mother Earth for time immemorial" (DeMeo, 1995). Before the Eagle Act, eaglets were captured, raised as a member of the family and treated with great respect and admiration. In exchange, their molted feathers were used as needed for various ceremonies (DeMeo, 1995; Wilson, 1929). As of 1999, the Zuni Tribe has a federal permit allowing it to keep live eagles. The Zuni Eagle Sanctuary is described in more detail below.

According to tradition, when the Jicarilla hunter kills a golden eagle he does not pull out the feathers himself, but brings the dead bird to the medicine man, who has the proper "eagle medicine;" without it, one's fingers would cramp up with rheumatic pains. A similar eagle medicine is found among the Cherokee, Caddo, and other tribes (Mooney, 1898). Other descriptions of the Jicarilla include capturing eagles by means of food tied to the top of an oval shaped blind, within which the hunter waited. Eaglets, taken from their nests, were kept alive in cages, plucked twice, and then freed (Opler, 2009).

Southeastern Tribes – Cherokee, Caddo

Traditionally among the Cherokee, the killing of a golden eagle (the bald eagle they do not esteem) was an event which concerned the whole settlement and could only occur in late fall or winter. The act could be undertaken only by the professional eagle killer, chosen for the purpose on account of his knowledge of the prescribed forms and the prayers to be said afterwards in order to obtain pardon for the necessary sacrilege. The large tail and wing feathers were taken for the Eagle Dance, but the body was left along with the bait used to hunt the eagle (e.g., deer), the latter a sacrifice to the eagle spirits (Mooney, 1900).

Historically among the Caddo, only a few medicine men who knew the prayers and ritual performance would kill an eagle. The Caddo eagle killer always took with him a robe or some other valuable offering, and after shooting the eagle, making the prayer, and pulling out the tail and wing feathers, he covered the body with the robe and left it there as a peace offering to the spirit of the eagle. The dead eagle was never brought home, as among the Cherokee. The last man of the Caddo who knew the eagle-killing ritual died in the mid-1800s, and since then the Caddo have gone without eagle feathers or acquired them from the Kiowa and other tribes (Powell, 1893).

Northeastern Tribes – Seneca

The early Seneca shot eagles with bow and arrow, and it was custom to sacrifice the first deer on the fall hunt to the eagle. The Seneca, unlike the Shawnee, do not extract the pith from the feathers because the pith makes the feather healthy; wearing the feather therefore makes the owner healthy. Feathers are used to make headdresses, that anyone may wear, and feather caps, worn by males. This historical tradition evolved to actual eagle trapping to procure feathers used in an Eagle Dance for a peace embassy to the Cherokee in about 1770, but since then no living individuals are known to practice eagle trapping (Fenton, 1991).

3.7.1.3 Permits for Indian Religious Purposes

The Eagle Act, originally passed in 1940, provides for the protection of the bald eagle and the golden eagle (as amended in 1962) by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest or egg, unless allowed by permit (16 U.S.C. 668(a); 50 C.F.R. part 22). This 1962 amendment also authorized the take of eagles for religious purposes of Indian tribes as requested by the Secretary of the Interior, who was concerned about the effect prohibiting all take of golden eagles would have on Indian religious and cultural use.

The Service issues three types of permits related to Indian religious activities under 50 C.F.R. § 22.22:

- An *Eagle American Indian Religious (EAIR) Permit* is available for various religious activities. The NER was established as a central clearinghouse to collect and distribute eagle parts. Eagles, parts and feathers for Indian religious purposes can be requested from the NER.
- A *Native American Eagle Aviary (i.e. Eagle Aviary) Permit* authorizes tribal entities engaged in religious activities to possess lawfully acquired bald eagles or golden eagles for Indian religious use.
- An *Eagle American Indian Religious Take (EAIRT) Permit* authorizes take of bald or golden eagles that is necessary for a traditional tribal religious ceremonial purpose that requires eagles to be taken from the wild.

The regulations pursuant the Eagle Act outline a specific process that must be adhered to in order to be granted an EAIR permit to possess and transport an eagle or eagle part from the NER for religious use. A member of a federally recognized tribe must submit a written application for an EAIR Permit, even if the eagle or eagle part will not be for individual use per se but rather for a "religious purpose of [the] Indian tribe." Applicants for eagles, parts, and feathers from the NER may only request one eagle or the equivalent parts of one eagle per application, and may only have one application pending at a time. Applications are processed in the order in which they are received. Only members of federally recognized tribes may legally possess eagle parts under a religious use permit.

A tribal official must apply on behalf of the tribe for an EAIRT Permit to take an eagle from the wild for religious use. Take of eagles may not be allowed without having obtained necessary tribal and state permits and/or certificates or registration. It is beyond the scope of this document to provide specific information regarding each tribe's or state's permit requirements. However, it is the responsibility of each applicant to contact the respective tribal and state wildlife agency to determine permitting requirements. The Service determines, upon application, whether there is a valid justification for the permit. When the appropriate Regional Director approves an application for religious use of eagles, an authorized permit is issued to the applicant. Usually, permits provide specific limitations, such as times, dates, places, methods of takings, numbers and kinds of wildlife, location of activity, or circumscribed transactions. Each Service region coordinates and consults with the respective tribes and states on a case-by-case basis.

National Eagle Repository

The NER outside Denver, Colorado serves as a collection point for dead eagles. Many of these birds have died as a result of electrocution or collisions with vehicles or infrastructure, unlawful shooting and trapping, or from natural causes. No one may salvage an eagle, dead or alive, or eagle parts for any purpose, including eagles or eagle feathers found by Native Americans on Indian lands. Rather, salvaged eagles are to be sent to the NER for distribution to permit applicants; thus, members of federally recognized tribes may only obtain eagles through the federal eagle permit system (see the Native American Eagle Aviaries subsection below). Once a permit is authorized, the Service sends the designated eagle or eagle parts from the NER to the applicant.

Roughly 42,000 orders have been filled at the repository since the building opened in 1995. In 2013-2014, the repository received about 2,400 birds and shipped almost 4,000 orders for eagles and eagle feathers to Native Americans. Over 1,000 of these orders filled were for whole eagles. Table 3.7-3 shows the most recent available statistics for the NER (USFWS, 2014b).

Table 3.7- 3. NER annual report, 10/1/2013 to 9/30/2014.

Service Region	Whole Eagles & Eagle Parts Received*	Whole Eagle Orders Filled	Eagle Feathers & Parts Orders Filled	Combined Orders Filled
1	239	135	376	551
2	65	479	1,113	1,592
3	591	129	357	486
4	352	24	114	138
5	229	24	110	134
6	492	170	519	689
7	216	3	13	16
8	125	62	240	302
Total	**2,309**	**1,026**	**2,842**	**3,868**

Source: USFWS, 2014b

**Note: The incoming bird count is not complete as birds received in September 2015 are still being evaluated. The final total number of birds and bird parts received will probably be about 2,400.*

While the NER provides thousands of Native Americans with eagles and eagle parts, the main criticisms of the system include:

1. Long processing delays;
2. Poor condition of some eagles received;
3. Lack of processing priorities;
4. Failure to acknowledge Indian sovereignty; and
5. Insensitivity toward Native American religion (DeMeo, 1995).

President Clinton's 1995 Eagle Feather Directive specifically instructed agencies to improve collection and transfer of eagles and eagle parts to the NER. Accordingly, the Secretary of the Interior developed and issued guidelines and policies, practices, and procedures necessary to implement these guidelines. The Region’s Special Agent in Charge of Law Enforcement and the supervisor of the NER conducted a series of tribal consultations throughout the U.S. to discuss the processing of requests for eagles from the Repository and identify ways to reduce waiting times for tribal members (USFWS, 2012).

Some Native Americans must capture a bird the traditional way in the wild, as their ancestors did, to properly perform sacred ceremonies. For Native Americans, permits to take eagles from the wild (50 CFR 22.22) are currently limited to tribes that can attest to a traditional religious need to take live, wild eagles for which the NER does not provide an adequate substitute. For example, as described above, the Service has issued an annual permit to the Hopi every year since 1987 allowing the take of up to 40 golden eagles per year. Most recently in 2012, the Service issued the NAT a permit for the one-time take of up to two bald eagles – the first permit the Service has issued for the take of bald eagles for religious purposes under the Eagle Act, although the Service has permitted take of golden eagles for religious purposes in the past.

The Service has issued EAIRT permits to eight tribes in situations where the case was made sufficiently that wild eagles were necessary to meet specific religious needs. Table 3.7-4 lists all the eagle take permits the Service has issued to tribes.

Table 3.7-4. USFWS eagle take permits issued to Native American tribes.

Year(s)	Tribal Entity	# of Golden Eagles	# of Bald Eagles
1987-Present	Hopi Tribe	Up to 40 nestlings	n/a
2007	Taos Pueblo	1 mature	n/a
2007	Pueblo of Isleta	2 mature	n/a
2010	Navajo	1 immature	n/a
2010	Pueblo of Pojoaque	1	n/a
2011, 2012	Pueblo of Jemez	Up to 6 total, either species	
2012-2015	Northern Arapaho	n/a	2 mature
2014, 2015	Jicarilla Apache Tribe	2 mature	n/a

Note: Numbers reflect authorized take, not reported take. Many of these permits were not successfully executed.

Native American Eagle Aviaries

In accordance with 50 CFR 22, in order to provide assistance to federally recognized tribes, the ability to possess live non-releasable eagles for religious uses, the Services' Migratory Bird Permit Office implemented the Native American Eagle Aviary (Eagle Aviary) Permit. Eagles housed in the aviaries are birds rescued from the wild because of sickness or injury and treated by wildlife rehabilitators, but the nature or severity of injuries prevent the birds from being returned to the wild. These eagles are then cared for, for the remainder of their lives at the aviary. Through the permitted aviary, Native Americans have an additional source of eagle feathers (through molting) for the cultural and religious needs. Table 3.7-5 lists existing and planned future aviaries.

Created in 1999, the Zuni Eagle Sanctuary is the first eagle sanctuary owned and operated by Native Americans, as well as the first aviary constructed for the purpose of cultural preservation. Operated in cooperation with the New Mexico Department of Game and Fish, the sanctuary has saved over two dozen injured eagles and currently houses and cares for 27 eagles. None of the eagles can be released back into the wild due to their injuries (Zuni, 2012; USFWS, 2015c).

Table 3.7-5. Native American eagle aviaries.

Tribal Entity	# of Bald Eagles	# of Golden Eagles
Pueblo of Zuni	12	15
Pueblo of Jemez	0	2
Iowa Tribe of Oklahoma	29	8
Comanche Nation of Oklahoma	8	9
Citizen Potawatomi Nation of Oklahoma	14	1
Navajo Nation	4	0
San Carlos Apache Tribe*	Unknown	Unknown
Fort Belknap**	Unknown	Unknown

Source: USFWS, 2015c

**The San Carlos Apache Aviary is currently under construction (USFWS, 2015c).*

***USFWS awarded Fort Belknap funding for construction of an eagle aviary in 2012 (NAFWS, 2012).*

The Navajo Zoo, the only Native American zoo in the U.S., is part of a pilot program to legally distribute golden eagle feathers molted from live birds to the Navajo people. The tribe received a permit in 2012 to provide the feathers, and members can submit applications to the Navajo Department of Fish and Wildlife. The zoo can provide a two to three week turnaround on applications, though the zoo only has four eagles (USFWS, 2015c; Fishler, 2015).

In 2005, the Iowa Tribe of Oklahoma received an Eagle Aviary - Live permit and a Tribal Wildlife Grant (TWG) for construction of the Grey Snow Eagle House, the first and only tribal aviary and rehabilitation center. After recent expansions, it now houses 29 bald eagles and eight golden eagles. The aviary manager is authorized by the Service to rehabilitate sick or injured eagles, and has successfully rehabilitated and returned twelve bald eagles into the wild.

The San Carlos Apache Tribe in Arizona has received a TWG to design and build an eagle aviary. The Southwest Region is currently working with the tribe to obtain a NAEA permit and to eventually acquire non-releasable eagles. In 2012, the Fort Belknap Indian Reservation in Montana was awarded funding from the Service for the construction of an eagle aviary (NAFWS, 2012). It will be the first tribal eagle sanctuary to open outside of the Southwest.

3.7.1.4 Illegal Take

In 1962, the Eagle Act was amended to allow eagles to be taken for the religious practices of Native Americans, since no historical evidence exists that Indians hunted eagles for subsistence or commercial purposes. However, recent popularity of Native American art and artifacts has fueled a lucrative black market in eagle and other migratory bird feathers and parts used to decorate Native American art objects.

Operation Eagle, a landmark investigation that terminated in June 1983, uncovered the killing and selling of more than 50 bald and golden eagles by (mostly) Native Americans in more than eight states, including some that were shot or trapped inside a National Wildlife Refuge. One theme often heard by undercover agents from dealers: because he had procured a permit to receive feathers from the NER, he erroneously stated he was authorized to keep and transport eagles and feathers. A man charged with killing eagles said he had done so because the wait was too long and he never knew where the parts the Service sent him had come from or what had killed the birds. As a result, there was no "life" in them. The feathers could not carry prayers to the Creator unless they were "clean"; they could not come from birds that had been electrocuted or poisoned (10th Cir., 2008; Beans, 1997).

The Service, often in cooperation with states or tribes, has conducted several investigations of the illegal killing, trafficking, and commercialization of eagles for the Native American pow wow trade. Evidence seized in 1999 in Tama, Iowa revealed at least 22 golden eagles and three bald eagles (USFWS, 1999). Operation Four Corners (ending in 1998) focused on the illegal take and commercialization of eagles; Operation Hanging Rock was a multi-state undercover probe of eagle take and trafficking (USFWS, 1999; USFWS, 2010a). Operation Rolling Thunder (ending in 2012) was an undercover investigation of illegal take and trafficking in eagles for the "parts" trade, with crimes that impact eagle resources and conservation in Montana and South Dakota (USFWS, 2012). In 2013 the last defendant in Operation Silverboy (an investigation of eagle trafficking) was sentenced to spend three years on probation and pay $6,000 in fines and $24,000 in restitution (USFWS, 2014c).

In 1991, the Service reported that this black market has resulted in "the slaughter of thousands of birds to fill this demand for feathers, and other parts such as beaks, bones, and talons." Some Native Americans also suspect that art dealers, collectors, and hobbyists may kill eagles simply to procure the feathers or eagle parts necessary for their artwork (DeMeo, 1995). The demand might have been suppressed by such highly publicized undercover operations as Operation Eagle in the mid-1980s and other pursuant successful operations, but the mania among some Americans and foreign collectors to own authentic Indian artifacts persists. While it is impossible to quantify the number of eagles killed per year for selling on the black market, for the purpose of this PEIS, it is assumed that this practice is ongoing and relatively widespread.

Other threats include eagles feeding on euthanized livestock or being shot by individuals for unknown purposes. These types of illegal take are outside the scope of this section and are discussed in the cumulative impacts analysis in *Chapter 4*.

3.7.2 Environmental Consequences

3.7.2.1 Impacts Common to All Alternatives

The analysis of cultural and religious resources evaluates the adverse and beneficial effects from the proposed eagle rule revision as it relates to the cultural importance of eagles to American Indian tribes and also as an American symbol. Adverse, direct impacts could occur if the ability of American Indian tribes to obtain eagles or eagle parts for traditional religious purposes is hindered, or if the cultural value of eagles for individuals (e.g., tribal members, member of American public) is compromised as a result of the issuance of take permits. Conversely, if permits are issued to cover existing activities that are currently operating without permits or future activities that may not otherwise apply for permits, impacts would likely be beneficial as conservation measures are applied to activities that are not currently implementing those measures now or would not do so in the future. The availability of EAIRT permits as it relates to the proposed eagle rule revision is at the core of this impacts analysis; a potential change in availability would constitute a direct impact. Indirect impacts to cultural and religious issues sensitive to change may include a change in availability for American Indian tribes to obtain eagle or eagle parts from the NER or a Tribal Repository.

Availability of EAIRT Permits

As shown in Table 3.7-4, from 1987 to 2007 the Service issued one EAIRT permit (to the Hopi). Since 2007, the Service has issued seven EAIRT permits in addition to the one issued to the Hopi Tribe. The Service expects that it will continue to issue more EAIRT permits to tribes, and recent discussions with several tribes would indicate that the Service expects more tribes to apply for EAIRT permits.

The issuance of EAIRT permits is given first priority and would continue to be given first priority under the No Action alternative as well as the four action alternatives. The proposed action does not affect the continuation of existing permits for EAIRT. Tribes that have received EAIRT permits have not been and would not in the future be required to conduct offsetting mitigation, as long as the level of take is considered compatible with eagle conservation. In most cases, currently unpermitted Indian religious take will be considered part of the baseline in the same way as unauthorized incidental take that was occurring prior to 2009. In these cases, new permits for EAIRT would not count towards the EMU limits. If issuing a permit for new (but historically practiced) or increased EAIRT would cause take limits to be exceeded, including LAP take limits, the Service would require reduction of other sources of eagle mortality in order to issue the tribal permit. Some incidental take permits for projects in the same LAP and EMU could require offsetting compensatory mitigation that may not have otherwise been required in order to ensure that take of birds necessary to meet the religious need of an American Indian tribe remains compatible with the preservation of eagles.

Varying take rates and risk levels for bald and golden eagles, EMUs, permit tenure, and permit criteria and conditions would directly influence the type and extent of mitigation needed to ensure eagle conservation; these factors are analyzed in detail under each alternative. The tenure of incidental take permits could influence the future development of some wind generation facilities, transmission lines, and other infrastructure, and therefore eagle populations. The duration of incidental take permits should not directly influence the issuance of permits for EAIRT. That said, permits for EAIRT may occasionally be unavailable under the No Action alternative as well as the action alternatives, but not only due to the tenure of incidental take permits. The likelihood of this scenario is analyzed in detail under each alternative.

Estimating Potential EAIRT Permits

As established in *Section 3.7.1, Affected Environment*, the eagle was traditionally incorporated into many Native American cultures, in many different ways. It is important to differentiate which of these activities would affect eagle populations. Most eagle or eagle parts needs are filled by the NER. Indeed, the NER fills about 2,400 orders for whole eagles and eagle parts per year. But if the eagle trapping or killing itself is part of a traditional religious ceremony, the eagle or eagle part cannot be adequately filled by the NER. In some cases it is unknown whether the eagle or eagle part provided by the NER would provide an adequate substitute. However, the take of eagles must be absolutely necessary to the religious needs of the applicant for FWS to issue an EAIRT permit; a simple preference for live take is insufficient. The eagle used in the Northern Arapaho's annual Sun Dance, for example, must be captured from the wild in a specific manner, according to religious belief, which ensures that the bird is pure. The NER, therefore, cannot provide an adequate substitute (10th Cir., 2008; Ojibwa, 2012).

Historical accounts of tribes with known traditional religious uses and ceremonies that require eagles or eagle parts considered for purposes of this analysis are summarized in Table 3.7-6. Those considered in this analysis have documented ceremonies or uses for eagles or eagle parts that arguably cannot be filled by the NER; have not been issued a permit for take of live eagles from the wild; and therefore may potentially request a permit in the future for take of live, wild eagles for a traditional religious purpose. Inclusion in Table 3.7-6 does not guarantee that the Service would issue a permit to the tribe, or imply that the tribe has requested or would request a permit from the Service. The information in Table 3.7-6 is by no means comprehensive and was compiled based on a preliminary yet extensive literature review.

Based on the following assumptions, the availability of EAIRT permits would not be relevant to several tribes (as reflected in Table 3.7-6):

- Generally, while individual eagle feathers from a certain part of the bird's body are particularly prized (i.e., tail feathers from the golden eagle), an eagle need not be taken from the wild merely to obtain these feathers.
- Generally, eagle feathers must be obtained without harming the bird or its ability to fly. After obtaining the necessary feathers from live eagles, they are usually set free.

By and large, most Native American traditional practitioners only used eagle parts and feathers salvaged from dead eagles and do not themselves kill eagles for religious purposes.

Tribes that may potentially request a permit in the future for the take of live, wild golden eagles under all alternatives include the Blackfoot and Cheyenne in Montana; Three Affiliated Tribes in North Dakota; Havasupai in Arizona; Miwok, Cahuilla, Luiseno, Miwok, and Chumash in California; Southern and Mountain Ute in Utah; Western Shoshone in Nevada; and Kootenai in Idaho and Montana. Note that discussion of the aforementioned does not imply that the Service would issue permits to these tribes or indicate that they have or would request a permit from the Service. This discussion also does not imply that the list of tribes mentioned above is complete.

The level and frequency of take of bald and golden eagles that might be requested from these tribes is largely unknown. The Cahuilla's Eagle Killing Ceremony, Southern and Mountain Ute's Sun Dance, and Cherokee's Eagle Dance are annual ceremonies. The Luiseno's funerary Eagle Ceremony is intermittent. Similar to the Hopi: the Luiseno, Cahuilla, and Miwok took golden eaglets from their nests, raised them in captivity, and sacrificed them according to ritual. One difficulty in using historical accounts to estimate the number of eagles that might be taken from the wild is determining its applicability in today's world (or lack thereof). For example, one historical account describes that "fifty or a hundred eagles might be caught in four days" for the Arapaho's Sun Dance (Wilson, 1929). However, it is unclear if all 50 or 100 eagles are needed each year or whether some of the eagle feathers or parts may be acquired from the NER (can have permits for both EAIR and EAIRT permits). Further, if historical accounts happen to quantify the number of eagles hunted or trapped, it appears to be based on the “success” of the hunt instead of the number of eagles needed for a specific ceremony. The number of eagles used or needed for sacrificial ceremonies are constant and irrelevant to the number of participants: the Hopi, for instance, take all available young from a specific set of sacred nest sites. Some tribes may reduce the number of eagles requested after the pre-application phase because ultimately the level and frequency of permits issued must allow management objectives to be met.

It is also largely unknown whether certain ceremonies or customs persist. Historically among the Caddo, only a few medicine men who knew the prayers and ritual performance would kill a golden eagle. However, the last man of the Caddo who knew the eagle-killing ritual died in the mid-1800s, and since then the Caddo have acquired eagle feathers through other means (Powell, 1893). Historical Chumash and Diegueno traditions, since lost, included the sacrifice of an eagle (or, rarely, a condor) at the winter solstice. As such, further analysis of these traditions with regards to EAIRT permits has been eliminated in this analysis for all alternatives.

Traditional Cultural Properties

The issuance of an incidental take permit in or close to a TCP with known eagle habitat should not directly affect the issuance of permits for EAIRT, but can affect tribal cultural values. The Service would conduct consultation, as necessary, on a case-by-case basis. Under Executive Order 13175, Consultation and Coordination with Tribal Governments, each Service Regional Director, in coordination with the Service Regional NAL, conducts government-to-government consultation with the tribes in their region and would do so for permits authorizing activities that may affect TCPs.

As appropriate under NEPA and Section 106 of the NHPA, an EA or EIS tiered from this PEIS would include a site- or project-specific analysis of potential impacts to cultural properties. The Service would take into consideration any effects that may result before issuing an incidental take permit in or close to a TCP with known eagle habitat.

The issuance of permits requiring a Section 106 process (as part of the NEPA process) would result in an increased level of identification and evaluation of TCPs compared to when projects move forward without permits. Section 110 of the NHPA reinforces that eligible (or listed) TCPs would be managed and maintained in a way that considers the preservation of its historical, archaeological, and cultural values in compliance with Section 106. Individual EAs or EISs tiered from this PEIS could therefore result in the development and implementation of agreements in consultation with Indian tribes regarding the means by which adverse effects on such TCPs would be considered.

Table 3.7-6. Traditional religious method, purpose, and eagle part used, by tribe.

Tribal Entity	State(s)	Method(s)	Specific Ceremony or Purpose	Eagle Part Used
Plateau and Plain Indians				
Lakota (Sioux)	Montana, North Dakota, South Dakota	Ceremonial pit eagle trapping	Sun Dance, graduation, war symbolism, feather fans, various religious ceremonies	Golden eagle tail feathers, bone whistles
Mandan, Hidatsa, Arikara (Three Affiliated Tribes)	North Dakota	Ceremonial pit eagle trapping/killing (sometimes)	Warbonnet	Golden eagle tail feathers (especially)
Southern and Mountain Ute	Utah	Ceremonial trapping/killing	Sun Dance	Eagle tail feathers (especially), bone
Blackfoot	Montana	Ceremonial pit eagle trapping/killing	Prayer sticks, medicine pipes, whistles	Golden eagle feathers, head, bone
Cheyenne	Montana	Ceremonial pit eagle trapping	Treatment of disease and injury by war doctors	Golden eagle feathers
California and Great Basin				
Northern Arapaho*	Wyoming	Ceremonial kill	Sun Dance	Bald and golden eagle feathers
Western Shoshone	Nevada	Catch and release (eventually)	Various religious ceremonies	Golden and bald eagle feathers
California and Pacific Northwest				
Kootenai	Idaho, Montana	Ceremonial pit eagle trapping	Treatment of disease and injury by war doctors	Golden eagle feathers
Cahuilla	California	Catch and sacrifice	Eagle killing ceremony	Feathers, sacrifice
Luiseno	California	Catch and sacrifice	Eagle ceremony (funerary)	Sacrifice
Miwok	California	Ceremonial capture/sacrifice	Wokile Dance - dance aprons, capes	Feathers, golden eaglets
Chumash	California	Ceremonial capture/sacrifice	Evening Stars rituals	Unknown
South and Southwestern				
Hopi*	New Mexico	Catch and sacrifice	Annual ceremony	Golden eaglets
Jicarilla Apache*	New Mexico	Ceremonial pit eagle trapping/killing or Catch and release after 2 years	n/a	Golden eagle feathers
Sandia Pueblo	New Mexico	n/a	Eagle Dance	n/a

Tribal Entity	State(s)	Method(s)	Specific Ceremony or Purpose	Eagle Part Used
Pawnee	Oklahoma	Ceremonial pit eagle trapping/killing	Unknown	Unknown
Havasupai	Arizona	Capture and kill (sometimes)	Unknown	Unknown
Southeastern				
Cherokee	North Carolina	Ceremonial pit eagle trap and kill	Eagle Dance	Golden eagle

**The Service currently authorizes take of golden or bald eagles.*

Effects to Native American tribe(s) or individuals could be emotional or spiritual if the permit issuance (or resulting development) is perceived as desecration of a TCP; and could occur regardless of whether eagles or eagle parts are used in traditional religious practices. The magnitude of the impact would likely be significant if the activity occurs in or adjacent a TCP and results in take of wild eagles. In most cases, it may be difficult to reasonably avoid or mitigate these potential impacts, but they would be analyzed and addressed during consultation. For example, the permit issued to the NAT in 2012 authorized the take of bald eagles for their annual Sun Dance. Limiting take to areas outside the Wind River Reservation, which is shared by the NAT and the EST, was considered necessary to protect the EST's religion and culture.

Eagle Remains, Parts, and Feathers

The availability of EAIRT permits would have no direct effect on most tribes. As mentioned previously, many religious uses involve eagle feathers or parts that can be supplied by the NER. While issues with the NER, such as long processing delays, continue to be addressed, they are not directly related to the availability of EAIRT permits under any of the alternatives. Based on the literature review conducted for this analysis, tribes are not known to object to the collection of molted feathers or use of feathers from an eagle carcass. (The EST do not object to the NAT using eagle feathers as part of their annual Sun Dance; the EST object to using parts or feathers of an eagle taken from the wild for this purpose).

Similarly, the availability of EAIRT permits would not affect the use of feathers handed or gifted down under any of the alternatives. The 2012 DOJ policy state that members of federally-recognized tribes can possess eagle feathers without a permit if they are found molted off a bird. These feathers cannot be sold but can be held in possession or used by tribal members for cultural purposes (DOJ, 2012). However, eagle remains found on tribal land cannot be retained and must be sent to the NER. The Nez Perce perceive such eagles as spiritual gifts that they were chosen to receive, and such an event is associated with specific prayer and ritual for retrieving a deceased eagle from their ancestral homelands; eagles from the NER may be from anywhere in the U.S. and cannot receive the same treatment (USFWS, 2014d). As such, the existing eagle rule under the No Action alternative and proposed revisions under the action alternatives would continue to prevent some tribes from traditional cultural practices and therefore have adverse impacts on the traditional cultural practice of some tribes, although those impacts would remain unchanged by the current proposed alternatives.

As described in *Section 3.7.1, Affected Environment*, some tribes (e.g., Navajo) traditionally trapped eagles, plucked their feathers, and later released them into the wild. The Service has not authorized this activity, and none of the existing EAIRT permits authorize this activity. It is unknown if any of the EIRT permits issued were in fact used for catch and release after plucking feathers. Theoretically, authorizing this activity could increase demand for EAIRT permits and decrease demand for feathers at the NER.

Native American Eagle Aviary Permits

The continued issuance of tribal eagle aviary permits could benefit tribes that do not need to take eagles from the wild but use eagle feathers in various ceremonies. Seven eagle aviary permits have been issued to tribal entities, authorizing the possession of lawfully acquired live bald and golden eagles for Indian religious use. Molted feathers from eagle aviaries used in religious ceremonies have presumably made acquisition of feathers much easier for associated tribal members. The overall demand for feathers and the wait time for NER orders from those without access to eagle aviaries could also be reduced as additional eagle aviaries are permitted. The quality of whole eagles, eagle feathers, or eagle parts from the NER is expected to remain the same.

Beneficial impacts could also occur with the continued issuance of Eagle Aviary permits, as the wait times to receive eagle feathers could decrease for tribal members.

Eagle Take Permits in General

For some tribes, the eagle's cultural value depends on the existence of wild eagles. These tribes, like the Navajo Nation and EST, are on record stating disapproval of any authorized take of wild eagles for any purpose. As such, these tribes could experience adverse effects under all alternatives due to the existing and future authorized take of wild eagles. The potential impact to these tribes would be adverse under all alternatives because the impact is dependent on the existence of the eagle take permit system and the concept of authorizing eagle take under any circumstance. The magnitude of the impact could vary somewhat under each alternative and would depend on the take levels, tenure of incidental take permits, and the type of mitigation required.

Other Cultural Values

Indirect emotional or spiritual impacts would not be limited to Native American tribes or individuals. As described in *Section 3.7.1, Affected Environment*, as the nation's symbol, the bald eagle represents U.S. citizens' sense of autonomy, courage, and power. It has also come to symbolize America's conservation history, and represents the ecological consciousness of American society and therefore the health of the environment. Issuance of an incidental take permit may be perceived by conservationists and some U.S. citizens as a step backwards in wildlife conservation.

3.7.2.2 Alternative 1: No Action

As shown in Table 3.7-4, the Service has issued eagle take permits to eight tribes from 1987 to 2015. The baseline for this PEIS includes historical take levels presented in the 2009 FEA. Historical take refers to all take, including those for American Indian religious uses. Annual authorized take from 1987 to 2015 has ranged from 40 golden eaglets to 43 golden eaglets and eagles; and up to two bald eagles (Table 3.7-4). The level of take that actually occurred under these permits is lower; average annual take has been closer to 23 eagles. (The Hopi, for instance take all available young from a specific set of sacred nest sites; they do not expand their collections in poor reproduction years to other nests to increase the collection.)

The Service has annually authorized the take of up to 40 golden eaglets to the Hopi Tribe and has for the past few years issued a permit to the Northern Arapaho for take of two bald eagles for their annual Sun Dance. Other tribes to whom the Service has issued eagle take permits in one or more years include: Taos Pueblo, Pueblo of Isleta, Navajo, Pueblo of Pojoaque, Pueblo of

Jemez, and Jicarilla Tribe. Under the No Action alternative, the Service is expected to continue to issue permits to the Hopi and other tribes that have historically taken eagles as necessary for tribal religious and cultural purposes, and this take is considered part of the baseline. Impacts from these permits would be negligible since the current level of authorized take would not be exceeded.

Under the No Action alternative, no permits can be issued for golden eagles east of the 100th meridian. As shown in Table 3.7-6, the Pawnee in Oklahoma and Cherokee in North Carolina may not be able to obtain EAIRT permits. These two tribes have known ceremonies or uses for golden eagles or eagle parts that arguably cannot be filled by the NER; have not been issued a permit for take of live eagles from the wild; and may potentially want to request permits in the future for take of wild eagles for a traditional religious purpose. Unless the Service can conclude that such take should be considered part of the 2009 baseline (or the take will be offset), the Service may not be able to issue these tribes golden eagles take permits. As such, potentially significant adverse impacts could occur to these tribes east of the 100th meridian.

3.7.2.3 Impacts Common to All Action Alternatives

Availability of EAIRT Permits

Under all action alternatives, the issuance of permits for golden eagles east of the 100th meridian would create beneficial impacts to tribes that were previously unable to obtain an EAIRT permit (if they historically took eagles, but not in the years leading up to 2009 when the baseline level of take was established). While any take of golden eagles under incidental take permits would need to be compensated for with offsetting mitigation, the terms of existing and future EAIRT permit would remain the same. Offsetting mitigation for an EAIRT permit authorizing the take of a golden eagle east of the 100th meridian would not be required. Establishing take limits that populations can sustain would help ensure that EAIRT permits continue to be issued where take is available because incidental take permittees would be required to provide offsetting mitigation if take levels are exceeded.

Incidental Take Permits

The clarification and standardization of compensatory mitigation requirements may increase the number of permits issued overall. Replacing the programmatic permit standard that take must be minimized to the maximum degree practicable (as opposed to be unavoidable) would likely encourage some project proponents to apply for permit coverage, resulting in additional avoidance and minimization measures being undertaken at those project sites. Such permits would also require funding for compensatory mitigation measures for take that exceeds take limits (i.e., all permits for golden eagle take). Compensatory mitigation designed to offset take would be required for take that exceeds EMU take limits. However, adverse impacts would likely occur to tribes, conservationists, and other members of the public who revere bald eagles, because compensatory mitigation would not be required for most incidental take permits for bald eagles if within EMU take limits. Bald eagle populations in most EMUs would continue to increase for some time, albeit more slowly than if compensatory mitigation was required.

All action alternatives are designed to reduce actual take by encouraging more permit applications; which would increase authorized take and decrease unauthorized take. The goal of the proposed revisions is to reduce actual take by authorizing take that requires the implementation of avoidance, minimization, and mitigation measures associated with eagle permits, which would benefit eagle populations. In this way, the action alternatives are expected to reduce the magnitude of impacts on tribal members whose cultural value depends on the existence of wild eagles, as well as the effect of eagle take on conservationists or anyone who might perceive increased take rates of the bald eagle as compromising the nation's symbol. Encouraging project proponents to apply for permits should also increase the implementation of monitoring and carcass collection requirements, which will potentially result in increased donation of eagle carcasses to the NER and decrease the wait times for eagle parts.

3.7.2.4 Alternative 2: Current EMUs, Liberal Take Levels

Potential impacts to cultural and religious issues would be similar to those discussed in *Section 3.7.2.3* under Impacts Common to All Action Alternatives and could consist of both beneficial and adverse impacts. With the higher take levels for bald eagles proposed under this alternative, minor adverse impacts could occur to those who oppose all authorized take of eagles due to cultural and/or symbolic values. This could include tribes whose cultural value depends on the existence of wild eagles, but also include conservationists or anyone who might perceive increased take rates of the bald eagle as compromising the nation's symbol.

3.7.2.5 Alternative 3: Current EMUs, Conservative Take Levels

Potential impacts to cultural and religious issues would be similar to those discussed in *Section 3.7.2.*3 under Impacts Common to All Action Alternatives. Extending the maximum duration to 30 years could cause the perception that incidental take permits would allow certain industries (i.e. wind) to take large numbers of eagles without oversight. As such, minor adverse impacts could occur on those whose cultural value depends on the existence of wild eagles, but could also include anyone that perceives the 30-year duration as overly accommodating of the wind industry and other industrial and commercial interests. Conservationists or others could also perceive the extended tenure as compromising eagle populations in the long-term.

As the number of projects seeking incidental take permits could increase with the extension of the maximum permit tenure, the likelihood of permits issued for wind generation facilities, transmission lines, and public service infrastructure in or near TCPs could increase. However, the permit process provides the obligation to consult under Section 106 of the NHPA, and so the likelihood of impacts to TCPs would be decreased. Indirect emotional and spiritual impacts to tribes or individuals may occur because, extending the maximum duration of incidental take permits may be viewed as damaging to eagles or as direct support for the wind industry or infrastructure development in general over the interests of tribes. However, the increased compliance under the Eagle Act that is expected to result from making longer-term permits available would better protect eagles because many projects that take eagles continue to proliferate and operate without permits and eagle conservation measures and compensatory mitigation that are required under permits.

As the number of authorized projects could increase with the extension of maximum permit tenure, the NER can expect a modest increase in eagle remains received from permittees who are required to report the eagles they take, which ensures those in suitable condition are sent to the NER. The average wait time to receive requested eagle parts from the NER would decrease, and in the long-term have moderate, beneficial impacts on tribal members who submit requests to the NER, particularly if the NER is supplied with more golden eagle remains, which are highly sought after.

Lastly, EMU take limits for bald eagles under Alternative 3 are lower than under Alternative 2, which means more compensatory mitigation would be required (once permit issuance reached the lower take limits). In addition, Alternative 3 would require a minimum level of compensatory mitigation for every incidental take permit. Those mitigation requirements would have beneficial impacts on eagle populations and also on those who value and/or use eagles for cultural reasons.

3.7.2.6 Alternative 4: Flyway EMUs, Liberal Take Levels

Potential impacts to cultural and religious issues would be similar to those discussed in *Section 3.7.2.*3 under Impacts Common to All Action Alternatives and under Alternative 2 in *Section 3.7.2.4*, except the modified preservation standard and codification of the LAP analysis would better protect eagles at a more local scale, benefitting tribes, conservationists, and others who culturally value eagles.

The shift to flyway EMUs would better mitigate for permitted take given seasonal movement patterns of eagles, and in this way, flyway EMUs would better serve the Service's management objectives and cultural values.

3.7.2.7 Alternative 5: Flyway EMUs, Conservative Take Levels (Preferred Alternative)

The potential impacts discussed in *Section 3.7.2.*3 under Impacts Common to All Action Alternatives, Alternative 3 in *Section 3.7.2.5*, and the Alternative 4 EMUs in *Section 3.7.2.6* would essentially be combined under this alternative. Extending the maximum duration of incidental take permits to 30 years would likely increase the overall level of authorized take, including from the future development of wind generation facilities, transmission lines, and public service infrastructure projects, but would decrease the overall level of actual take because more future developments by those industries are expected to apply for permits and implement conservation measures to avoid, minimize and mitigate their impacts on eagles.

The impacts of modifying the eagle preservation standard and incorporating the LAP analysis in the regulations would be the same as under Alternative 4.

As discussed under Alternative 3, the number of incidental take permits issued would likely increase, accompanied by more consultation under Section 106 of the NHPA, with moderate beneficial effects to TCPs and those who value them.. Indirect emotional or spiritual impacts to tribes or individuals would be similar to those discussed under Alternative 3. Alternative 5 does not include the requirement for a minimum level of compensatory mitigation that would be required under Alternative 3, and in this respect, would have not be as beneficial to eagles.

However, compensatory mitigation for golden eagle take that exceeds EMU take limits would be required at a ratio greater than 1:1, which could not only reduce the magnitude of emotional and spiritual impacts for some but also would better mitigate the currently high levels of unauthorized golden eagle take, with associated long-term moderate to major beneficial effects to those who culturally value golden eagles. In sum, the benefit to EAIRT permittees in the long-term would the most significant under this alternative.

3.8 Socioeconomic Resources

3.8.1 Affected Environment

The analysis of socioeconomic resources identifies those aspects of the social and economic environment that may be affected by the proposed revisions to the 2009 permit regulations. It is outside the scope of this programmatic analysis to discuss project- or site-specific socioeconomic impacts as they relate to demographics, noise, jobs, or taxes. The industries most likely to be directly affected include long-term infrastructure and public service projects, such as real estate development and transportation, and public utility, resource development, and energy projects.

Economic considerations for developers include project finance, contracts or agreements, and weighing the cost of obtaining and complying with an eagle take permit against the risks, financial and nonfinancial, of operating without one. The societal impacts analysis focuses on how recreational opportunities, aesthetic and other societal values might be affected by the proposed revisions.

3.8.1.1 Project Finance and Economic Development

Project finance is the long-term financing of infrastructure and public services projects. Financing decisions are based on the ability of projected cash flows of the project to support debt or equity investments. Many long-term infrastructure projects and public services - like real estate development; transportation, public utility, dam, and renewable energy projects - rely heavily on project finance markets to fund new projects. In pursuing project finance, developers primarily recruit two types of investments: tax equity and project debt (AWEA, 2014).

Tax Equity

The availability of federal tax credits helps to recruit private capital from investors, whose large federal tax obligation makes such investments attractive. This is similar to the way many companies in the U.S. prefer to lease instead of purchase equipment from a financial entity.

For renewable energy projects, tax equity investors make an equity investment on or around the date that construction is completed. Tax equity investors “pre-screen” and assess projects during the late stages of development, commit to deals when sufficient detail is available for the project, and close the deal when operations commence. Projects are evaluated based on projected cash flows and expected output to generate production tax credits (PTCs) and the investment basis by which depreciation is calculated (AWEA, 2015b).

Several federal incentives provide financial support for different types of development. For example, the Renewable Electricity PTC is a federal incentive that provides financial support for the development of renewable energy facilities. A tax credit is a dollar-for-dollar reduction in the income taxes that the entity claiming the credit would otherwise have to pay the federal government. Originally enacted as part of the Energy Policy Act of 1992, the PTC has been renewed and expanded numerous times. The Consolidated Appropriations Act, 2016 (H.R. 2029, Sec. 301) most recently extended the expiration date for this tax credit to December 31, 2019 for wind facilities commencing construction, and for other eligible renewable energy technologies commencing construction through December 31, 2016. Projects that are not under construction prior to December 31, 2019 (previously prior to January 1, 2015) are ineligible for this credit, with incremental reductions in value for wind projects commencing construction in 2017, 2018 and 2019 before expiring in January 2020. The Act applies retroactively to January 1, 2015, meaning any qualifying project that commenced construction at any point in 2015 is eligible to claim the PTC (DOE, 2015a). Due to the uncertainty that the credit will still be available to them when the project is completed (the local zoning and state and federal permitting process for wind energy, for example, can take up to two years), renewable energy developers that depend on the PTC to improve a facility's cost effectiveness may hesitate to start a new project or have difficulty securing financing or signing a power purchase agreement.

Some renewable energy developers can receive an Investment Tax Credit (ITC) in place of the PTC. Section 48 of the Internal Revenue Code provides an ITC for certain types of small wind projects and micro turbines placed in service until December 31, 2016. The ITC is related to the cost of developing a project, as opposed to the income generated from a project (DOE, 2015b). The §1603 American Recovery and Reinvestment Tax Act Program, or the §1603 program, is a finance mechanism that allowed renewable energy project developers to receive a direct federal grant in lieu of the Section 48 ITC. Since the §1603 Program expired in 2012, developers increasingly rely on the PTC or ITC as funding sources for renewable energy projects (Treasury, 2015a; Treasury, 2015b).

Project Debt

Project debt transactions also tend to close near the end of the construction phase, but can often be coordinated with construction lending that is used to pay for the construction contractor. Project loans go through a similar prescreen process as tax equity, so the activity associated with raising this capital occurs largely before the project is completed. Project lenders or debt lenders focus on a metric known as debt service coverage, which measures how free cash flows from project operations compare to required principal and interest payments with project debt obligations (AWEA, 2015b).

The debt service coverage ratio (DSCR) is the ratio of net operating income to the amount of money that is required to make regular debt payments. Said otherwise, DSCR measures the ratio of cash on hand (through net income and incentives, for example) that can be used to pay for required annual payments, including debt principal, debt interest payments, operations and maintenance, sinking funds, and any lease payments.

For renewable energy projects, for example, a DSCR must be at least greater than one. Most have been between 1.2 and 1.5 (i.e., $120-$150 for every $100 in obligations), but higher DSCRs are often required as debt markets are tight. This additional cushion of cash is particularly important for projects with variable resources (and thus variable cash flows) like wind, because the actual output of a project might be lower than the projected average in any particular year. A DSCR of less than one means that the project will have to dip into reserves or other financial resources to cover debt payments. While there may be a grace period during construction, or even into early project operation, as a rule, debt principal and interest (and other annual costs) must be covered every year (Windustry, 2014).

Power transmission and distribution investors look at the debt/equity ratio, a metric used to determine the degree of a company’s financial leverage. The debt/equity ratio compares a company’s total liabilities by the amount of equity provided by stockholders. This metric reveals the respective amounts of debt and equity a company utilizes to finance its operations. For companies providing general utilities such as gas and electricity, the average debt/equity ratio is approximately 1.3.

Utilities are often publicly run, funded or granted special monopolistic authority over their respective communities. These barriers against competition make utilities unusually stable and profitable once established, and revenue streams tend to be consistent. Utility companies raise capital (debt or equity) for huge, long-term projects. Utilities carry high debt levels as their infrastructure requirements make large, periodic capital expenditures necessary, and taking on increased loads of debt is usually a sign of expansion. They also have a large amount of investment equity because they are such “bedrock” stocks; they are included in the investment portfolio of many funds and individual investors.

Deregulation of electric utilities began in the 1990s, and entry barriers for market players continue to be eliminated. Historically, utilities have had the right to build the transmission lines in their service territory. The Federal Energy Regulatory Commission’s Order 1000 will largely revoke utilities’ “right of first refusal” (ROFR) to build transmission lines in their traditional service territories. Instead, independent transmission companies can propose to build, own and operate new transmission facilities in these territories (FERC, 2015).

Project Finance Investors

Project finance investors perform a critical role in the industry as their risk preferences drive industry trends and reinforce safeguards in favor of economically sound projects. For the emerging wind industry, stable policy entices manufacturers to invest in U.S. based facilities, often bringing their supply chain with them. This has helped to bring down wind turbine costs and has boosted domestic content. While the industry currently lacks the long-term policy support needed to guarantee a stable market, the market will continue to offer new opportunities as current and new manufacturers develop domestic supply chains.

Large domestic and foreign banks and insurance companies are the major players in the tax equity field. Some insurance companies are also active in the project debt space as they are drawn to the long-term debt that is common in project finance. Contracts with power utilities that provide stable, long-term cash flows attract a variety of capital sources to invest in wind projects. Strategic corporate investors, like power utilities or turbine manufacturers, often participate in tax equity or debt markets. In 2014, major corporations like Amazon, Dow Chemical, and Yahoo! entered into their first Power Purchase Agreements (PPA) for wind generated electricity, while tech companies Google and Microsoft continue to sign new contracts. Hedge funds and private equity focus mainly on company investments, but occasionally make investments into projects with equity, debt, or mezzanine (hybrid) structures (AWEA, 2015a).

Project Finance Contracts/Agreements

In project finance the revenue is often contracted (rather than being sold on a merchant basis). For example, concession deeds are used in most infrastructure projects that involve government, and concede the use of a government asset (such as a plot of land or river crossing) to the project company for a specified period. Concession agreements include contracts for transportation systems (e.g., railway) for which the public pays fares to a private company, ports and airports where payments are usually made by airlines or shipping companies, or utility projects where payments are made by a municipality or by end users.

Off-take agreements between a project company and the party who is buying or selling the product govern mechanism of price and volume, which make up revenue. The intention of such agreements is to provide the project company with stable and sufficient revenue to pay its project debt obligation, cover the operating costs, and provide certain required return to the sponsors. Long-term sales contracts and hedging contracts are between a producer of a resource to purchase/sell portions of the producer's future production and are frequently used in natural resource development or commodities markets (e.g., mining, oil and gas) where the capital costs are high and the company wants a guarantee that some of its product will be sold. These agreements are normally negotiated prior to the construction of a facility (e.g., mine, wind generation facilities) in order to secure a market for the future output of the facility. If lenders can see the company will have a purchaser of its production, it makes it easier to obtain financing to construct a facility.

PPAs are a contract between two parties: one generates electricity (the seller) and one purchases the electricity (the buyer). The PPA defines all of the commercial terms for the sale of electricity between the two parties, including when the project will begin commercial operation, schedule for delivery of electricity, penalties for under delivery, payment terms, and termination. A PPA is the principal agreement that defines the revenue and credit quality of a generating project and is thus a key instrument of project finance. Due to the scope of this programmatic analysis, the terms of a PPA are described and analyzed throughout this section as an example of the types of impacts that might occur to industries likely to develop in eagle habitat and which therefore could require an eagle take permit.

For a developer, a PPA secures a long-term revenue stream through the sale of energy from the project. Securing a PPA is also a condition to any equity and debt financing of the project. Power may be sold through a PPA to an investor-owned, municipal, or rural electric cooperative utility in the local market or, in some cases, to more distant utilities or wholesale or retail customers in unregulated markets ("off-takers"). While price terms are an important element of a PPA, many other vital provisions address the length of the agreement, the commissioning process, the purchase and sale of energy, curtailment agreements, transmission issues, milestones and defaults, credit, insurance, and environmental attributes or renewable energy credits (RECs).

PPAs are long-term agreements, most are 20 years, though a term ranging anywhere from 15 to 25 years is not unusual. The PPA is usually legally binding once it has been executed by representatives of both the seller and the purchaser, subject to early termination rights. The PPA may also provide the purchaser an opportunity to extend the PPA to include a renewal term beyond the initial stated term, such as an additional five years (Windustry, 2007).

PPAs include several provisions that may allow one or both parties to terminate the PPA prior to the commercial operation date if:

- The PTC is not available;
- The seller's or purchaser's internal approvals, or any required regulatory or third party approvals, are not received;
- Permits necessary for the construction and operation of the project are not obtained;
- The seller has not entered into an acceptable interconnection agreement;
- Financing is not available;
- Transmission access has not been secured; or
- Site control is not secured.

Conditions for commercial operation may also require the seller to demonstrate to the purchaser that all permits, consent licenses, approvals, and authorizations required by any government authority have been obtained. The PPA may also identify a variety of milestones to be met to reach commercial operation, including acquisition of all permits needed for construction, execution of a construction contract, commencement of construction, evidence of the seller's purchase of wind turbines, and ultimately, commercial operation. If the PPA addresses milestones, typically the seller must meet the dates established in the PPA for each of the milestones or risk paying delay damages. Delay damages are often calculated by multiplying a dollar amount by the number of MWs of contracted capacity for each day the seller fails to meet a milestone. For example, if the seller is 60 days late performing a construction milestone on a 25 MW project, the delay damages might be $7,500 ($5 x 25 MW x 60 days). The PPA may also include a provision that allows the seller to recover any delay damages paid to the purchaser for earlier missed milestones if the seller is able to deliver the project by the milestone for commercial operation.

3.8.1.2 Planning Considerations

Wind Energy Guidelines and Eagle Conservation Plans

In some situations, eagles and other raptors, bird species, and bats, collide with spinning wind turbine blades. In addition, the windiest and best locations for wind energy production often coincide with prime eagle habitat and migratory corridors. As advances in wind energy technologies and increased interest in renewable energy sources have resulted in rapid expansion of the wind energy industry in the U.S., the Service developed Voluntary Land-Based Wind Energy Guidelines in 2012 to help shape the siting, design and operation of the wind industry with regard to wildlife protection. The Service guidelines also provide a structured, scientific process for addressing wildlife conservation concerns at all stages of land-based wind energy development, as well as Best Management Practices for site development, construction, retrofitting, repowering, and decommissioning.

The Service also developed Eagle Conservation Plan Guidance for wind energy which includes recommendations on evaluating the risk to eagles posed by a proposed site for a wind generation facility, categorizing a site based on that risk, the protocols for pre-construction and post-construction studies, and options for mitigating impacts, among other issues. The Service strongly recommends that companies planning or operating wind power facilities in areas where eagles occur work with the agency to implement that guidance completely as part of the process of developing an application for an eagle take permit. As of 2009, permits are available to take eagles in the course of conducting other lawful activities and to take eagle nests when necessary to protect human safety or the eagles. Wind energy companies are not technically required to have an eagle take permit to operate, but will violate the Eagle Act if take of an eagle occurs during construction or operations without first obtaining a permit.

Electric Utilities and Avian Protection

The transmission of energy from where it is generated to where it is used involves millions of miles of conducting lines of various sizes, towers, poles, and other hardware, all of which pose a varying range of collision or electrocution risk to eagles (and other birds). Transmission lines pose risk of collision to flying birds, and in some locations eagles choose to nest on large towers. The smaller distribution lines and their equipment (e.g., transformers) can also pose risk of electrocution.

In the 1990s, the Service launched an effort to reduce power line hazards that kill eagles and other raptors, calling for increased industry awareness, research on ways to reduce electrocutions, collection of bird mortality data, public outreach, identification and correction of problems on Service lands, and enforcement efforts to promote the development of Memoranda of Understanding (MOUs) and avian protection plans with power companies. Efforts to increase industry awareness included teaming with a consortium of industry and non-profit groups to produce and distribute over 4,000 copies of “Raptors at Risk,” an award-winning video that documents the electrocution problem and shows utilities how to protect birds. Copies were made available to every Service special agent, every national wildlife refuge in the U.S., and every State fish and game agency as well as many private organizations, including Audubon Society chapters and electric utility companies (USFWS, 2001).

The Service has forged proactive partnerships with industry to address electrocution threat to eagles and other birds, including remedial action. Utility companies in Utah retrofitted approximately 260 power poles to make them bird-friendly, and in FY 1999 the utility industry in Utah reportedly spent approximately $223,000 to prevent raptor electrocutions. In the Uvas Valley near Hatch, New Mexico, a wintering area for many raptors including golden eagles, meetings with the local electric power company secured the retrofitting of power poles at an estimated cost of $40,000 (USFWS, 2000). A city in Kansas agreed to retrofit all 8,000 transformers in its electric power system after learning that its power lines had electrocuted an eagle (USFWS, 2001).

Efforts to secure voluntary compliance have also often been successful. Holy Cross Electric of Colorado earmarked $1 million for protecting migratory birds, marking the first time a company has agreed to fund such efforts voluntarily (USFWS, 2000). In 2002, an historic MOU covering Wyoming and Colorado was signed with Xcel Energy and the Service's Denver, Colorado Regional Office in concurrence with the Department of Justice (Manville, 2005). A utility company in Oregon developed and implemented a multi-year avian protection plan for the Klamath Basin, an area that has the largest wintering population of bald eagles in the lower 48. The company was expected to spend as much as $1 million on efforts to prevent raptor electrocutions over a five-year period (USFWS, 2005). A large rural electric cooperative in Wyoming pledged to update its Avian Protection Plan and budgeted approximately $1.1 million for proactive retrofitting and another $1 million for two large bird protection projects to reduce take of golden eagles (USFWS, 2010a).

As part of the Avian Power Line Interaction Committee, the Service helped develop resources to describe the effort of the Service and utilities to address these issues, including: Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006; Reducing Avian Collisions with Power Lines (2012); Avian Protection Plan Guidelines (2005).

Enforcement

The Service uses enforcement as a last resort, preferring to first work collaboratively with companies to minimize risk to eagles and ensure the long-term health of eagle populations through the issuance of take permits. However, if companies repeatedly ignore the problem, the Service may undertake enforcement action them (USFWS, 2000; USFWS, 2014c). Companies operating without an eagle take permit risk federal penalties, including criminal prosecution, under both the MBTA and the Eagle Act for any unauthorized take of eagles. The Eagle Act prohibits anyone from taking, possessing, or transporting a bald or golden eagle, or the parts, nests, or eggs of such birds without prior authorization. This includes inactive nests as well as active nests. The first criminal offense is a misdemeanor with maximum penalty of one year in prison and $100,000 fine for an individual ($200,000 for an organization). The second offense becomes a felony with maximum penalty of two years in prison and $250,000 fine for the offending individual ($500,000 for an "organization" such as a business). The Eagle Act also provides for maximum civil penalties of $5,000 for each violation. Under the MBTA, which prohibits take and sale of listed birds including eagles, take alone is a misdemeanor violation with maximum penalty of six months in prison and $15,000 fine, and commercialization is a felony violation with a maximum penalty of two years imprisonment and $250,000 fine ($500,000 for an organization) (USFWS, 2012).

Moon Lake Electric Association in Colorado was the first company to be criminally convicted of MBTA and BGEPA violations in connection with bird electrocutions. The plea agreement included $100,000 in fines and restitution, three years of probation, a signed memorandum of understanding (MOU) with the Service, implementation of an avian protection plan, and the retrofit of poles that were killing raptors (Manville, 2005).

The Department of Justice's first-ever prosecution of a wind generation facility operator for "unpermitted avian takings" resulted in Duke Energy Corporation agreeing to a $1 million settlement for killing 14 golden eagles and at least 149 other protected birds at two of the utility's wind generation facilities. PacifiCorp, one of the largest electric utilities in the West, was the second to be sentenced to fines for killing hundreds of protected birds in Wyoming with its turbines, and must pay $10.5 million in fines, restitution, and community service. In 2009, PacifiCorp pleaded guilty to all 34 counts of unlawfully taking golden eagles, hawks, and ravens in violation of the MBTA having killed 232 eagles in Wyoming from January 2007 to the present. PacifiCorp will spend the next five years on probation, during which time it has been ordered to spend $9.1 million to repair or replace its equipment to protect migratory birds from electrocution in Wyoming. As part of its plea agreement, it has committed to a comprehensive plan to continue such efforts in partnership with the Service, to seek eagle take permits for each project, and to work to prevent future eagle deaths. PacifiCorp will spend approximately $600,000 annually to implement the compliance plan, as well as to apply for a programmatic permit at each of the four wind projects (DOJ, 2014; Indian Country, 2015).

Other companies have been fined for activities that occurred during the construction phase of a project. For example, in 2005, a company responsible for the destruction of an eagle nest tree on property where it was building a housing development in Collier County, Florida, pleaded guilty to violating the Eagle Act and was fined $356,125 – one of the largest penalties ever assessed under this statute. An individual associated with the company also pleaded guilty to violating the Eagle Act and was sentenced in 2006 to a $5,000 fine and three years on probation (USFWS, 2012). In 2008, an Alaska power company pleaded guilty to destroying a bald eagle nest while building a hydroelectric project, and must pay a $50,000 fine and $75,000 in restitution (USFWS, 2008b).

Financial Risks

Companies operating without a permit, avian protection plan, or eagle conservation plan can also risk their project financing. For example, NaturEner operates a 189-MW Rim Rock wind generation facility in Montana. In 2011, the California Public Utilities Commission approved two contracts between San Diego Gas & Electric (SDG&E) and NaturEner. SDG&E, a Sempra Energy subsidiary, agreed to buy renewable energy credits from the Rim Rock project at a fixed price. The Sempra Energy utility also agreed to invest about $285 million in tax equity financing in the project. Using a roughly $300 million construction loan from Morgan Stanley, NaturEner built the Rim Rock wind generation facility and brought it online in 2013. NaturEner planned to use the tax equity financing from SDG&E to pay off the loan to Morgan Stanley.

The contracts require NaturEner to develop plans for protecting bats and birds at the Rim Rock wind generation facility before SDG&E makes the equity investment. SDG&E has filed a lawsuit to get out of the aforementioned contracts, claiming that NaturEner has not met these contractual obligations intended to ensure that the project operates in compliance with federal environmental laws. NaturEner worked with the Service to develop an avian protection plan for the Rim Rock wind generation facility, and recently finished an eagle conservation plan. NaturEner offered to indemnify SDG&E from any financial risks related to harming birds and bats at the wind generation facility, but SDG&E refused. If SDG&E fails to make its equity payment, Morgan Stanley can foreclose on NaturEner USA, NaturEner Holding, NaturEner Wind Energy, plus the Rim Rock project and the Glacier 1 and 2 wind generation facilities totaling 210 MW. The Glacier wind generation facilities are under contract to SDG&E (Platts, 2013).

Nonpurposeful Programmatic Take Permits

In 2011, enXco, an EDF Energies Nouvelles Company (seller), entered into a 25-year PPA with Pacific Gas and Electric (PG&E) Company (buyer) for the Shiloh IV Wind Project, a 102-MW wind facility in Solano County, California. The project became operational in 2012 and qualified for PTCs to meet the commercial delivery terms of the PPA (USFWS, 2014f).

In 2014, the Service issued its first five-year programmatic wind permit to Shiloh IV Wind Project LLC, which requires the company to engage in conservation measures that protect eagles while providing greater regulatory certainty for the company. EDF Renewable Energy's Eagle Conservation Plan includes offsetting mitigation, such as retrofitting 133 electric distribution poles to minimize the potential for electrocutions. The plan was prepared in close coordination with the Service using eagle conservation guidelines developed for the wind energy industry (USFWS, 2014e; USFWS, 2014f).

The EDF Group subsidiary had the option of applying for a 30-year permit under a rule published in 2013 (since vacated), but the company declined. For its part, the wind industry has generally sought the longer-term permits, on the basis they are needed to align with and secure long-term power purchase agreements (NWW, 2015).

3.8.1.3 Societal Issues

Quality of life can be characterized as a person's well-being and happiness. What constitutes a positive quality of life is subjective and cannot be solidly defined. For this analysis, quality of life considerations focus on those elements that the public generally associates with a high quality of life as they could relate to development that affects eagles: recreational values of birding, including its educational value, and the aesthetic value of viewing an eagle or knowing it exists.

Recreational Values

The recreational value of natural resources can link residents to an area or attract new residents to an area. Proximity to nature, in particular to public lands, can influence where people choose to live and how much people are willing to pay for housing (i.e., property values). Research by Hand et al. (2008) indicates that people make regional housing and labor market decisions based in part on the availability of and proximity to public lands, such as forests, lakes, mountains, etc. Living proximate to public lands provides amenities such as convenient access to recreation and wildlife viewing, and can also include disamenities such as crowds, litter, and noise. That is, population movement and migration into environmentally desirable areas can be explained by the presence of and density of natural resources and associated environmental amenities. Additionally, housing prices in certain regions of the U.S. are higher based on overall proximity and access to public lands (Hand et al., 2008).

Eagles can contribute to recreational values, such as birding. According to the 2011 National Survey of Fishing, Hunting and Wildlife-Associated Recreation published by the Service, about 47 million Americans over the age of 16 observed birds (USFWS, 2011c). In 2011, the 11.9 visits to National Wildlife Refuges primarily for birding generated over $257 million in economic activity; $73.9 million in job income; and 3,269 jobs (USFWS, 2013b).

In part due to the public attention bald eagles attract, they have an educational value as well. Birdwatching can be used to foster ecotourism as a source of income. Many nature centers and nonprofit environmental organizations create revenue through bird watching tours. These kinds of activities can also be used to introduce students and children to the outdoors in order to foster an appreciation for nature.

Aesthetic Values

Landscape appearance and scenery can be important public land amenities, not just as recreation opportunity settings, but also as elements of the region's identity. Resource values such as clean air and water quality, scenery and natural landscape, open space, and the number of recreation opportunities (including wildlife watching and birding) can be economic assets themselves for local economies. Eagles can provide spiritual enrichment and an appreciation of nature; sighting a bald or golden eagle can fulfill an aesthetic value.

Non-Use and Existence Values

The value held by natural resources for purposes other than direct use is called non-use value and has been well-documented in literature (Brookshire, 1983). There is value in knowing that bald and golden eagles exist, even for those who have never seen one. The existence value of an eagle reflects the benefit people receive from knowing that it exists, or its intrinsic value.

In general, it is not possible to use market prices or other revealed preference methods (e.g., consumer behavior) to capture the existence value of the bald or golden eagle. The concept itself is controversial, as many oppose the notion of assigning dollars values to a species such as the bald or golden eagle. However, disasters such as the Exxon Valdez and more recently with the BP Oil Spill have created the need and opportunity to estimate non-use values of species and environmental resources. "Stated preference" survey methods such as the contingent valuation method involve directly asking people, based on a specific hypothetical scenario and description of the environmental good or service, how much they would be willing to pay (WTP) for a change in that environmental good or service.

Eagles have served as powerful symbols in numerous cultures throughout history. In the United States, Congress chose the bald eagle to be depicted on the official seal of the United States. In its capacity as the Nation's symbol, the bald eagle generally represents Americans' sense of autonomy, courage, and power. Today, bald eagle imagery is ubiquitous in American culture, attesting to the widespread symbolic importance of bald eagles in U.S. society (USFWS, 2007d). As the nation's symbol, the bald eagle has a high existence value compared to other species (Ninan, 2009). Three example studies in the U.S. valuing bald eagle conservation were found as a result of a basic online literature search. The first surveyed Wisconsin households and found an average WTP of roughly $21 annually to avoid further loss of the species (Boyle and Bishop, 1987). Another study in 1991 surveyed New England households and found an average WTP of about $32 to $45 annually, depending on the choice format used (Stevens et al., 1991). The third in 1993 surveyed Washington visitors rather than households and values a 300% gain in the species. The author found an average lump sum WTP of $245 to $350 depending on the question format (Swanson, 1993).

The bald eagle is also widely portrayed as a symbol of environmental progress, concern, and/or general awareness. The remarkable decline and recovery of bald eagle coincides with the emergence of the ecological movement in the United States in the late 1960’s and century: bald eagles nearly became extinct due to expansive use of chemical pesticides during the booming post World War II years, but then recovered dramatically when growing ecological awareness led to increased regulation of pesticides and the passage of numerous laws protecting wildlife and the environment. To many Americans, the bald eagle has come to exemplify ecological consciousness and the health of the environment (USFWS, 2007d).

3.8.2 Environmental Consequences

The analysis for socioeconomics evaluates the social and economic effects, both positive and negative, of the proposed revisions to the permit regulations as they relate to businesses and industries likely to develop in areas where eagles occur, and to the aesthetic and recreational values of the public. The impact analysis hinges on the cost, conditions, risks, and delays associated with the issuance of permits to applicants for development as it relates to the proposed eagle rule revisions. Direct impacts include potential impediments to development or project delays, and potential benefits would include streamlining the incidental take permit process and facilitating legally-compliant development. The proposed revisions could indirectly impact investors, manufacturers, and property and use values. Management choices could also indirectly impact the recreational or aesthetic values.

3.8.2.1 Impacts Common to All Alternatives

Incidental Take Permits

None of the alternatives would affect the status or terms and conditions of already-issued permits.

3.8.2.2 Alternative 1: No Action

Nonpurposeful Programmatic Take Permits

Under the No Action alternative compensatory mitigation requirements would not be clarified or standardized, which creates uncertainties for applicants with regard to costs. In the case of renewable energy projects, compensatory mitigation costs can affect different parts of the DSCR equation and would be project-specific. Additional capital expenditures for physical and technological assets and associated employee training could increase overhead costs. In these cases, operating costs (e.g., additional staff for monitoring) could increase, which would cause the net operating income to decrease and also lower the DSCR for a wind project.

In general, the 5-year tenure of current programmatic permits could dissuade future “buyers” of a PPA if the permit is subject to renewal every five years, there is a least the theoretical potential that permit conditions can substantially change upon renewal. The possibility of costly equipment updates and pauses in energy production could discourage investors.

Under this alternative, the Service cannot issue permits for golden eagle take east of the 100th meridian. With some eastern states setting goals to generate a certain percent of electricity demand from renewable sources by a certain date, wind power is likely to play an increasing role in meeting that goal. While no golden eagle deaths from wind turbines have been reported in the eastern United States, increased wind energy development will eventually result in eagle take and render developers at risk of federal prosecution. Under the No Action Alternative, potential enforcement actions for unauthorized take would likely create adverse impacts to developers east of the 100th meridian, which could be moderate to significant to those individual companies. The financial risk and cost of criminal prosecution could be significant in the short-term and long-term.

Under the No Action Alternative, there would be moderate beneficial effects to recreational and aesthetic values from the compensatory mitigation that may be required for any bald eagle take permit. In addition to the potential for more abundant bald eagle populations, much of this compensatory mitigation would likely be habitat-based, which would result in preservation of undeveloped and less developed land, and in some cases, restoration of ecological functions, which can benefit recreationists and those who value “natural” landscapes and wildlife.

There would likely be moderate adverse impacts to recreational and aesthetic values with regard to golden eagles from Alternative 1 because the high level of golden eagle mortality from unauthorized take of golden eagles would not be addressed.

3.8.2.3 Impacts Common to All Action Alternatives

Under all action alternatives, the issuance of permits for golden eagles east of the 100th meridian would create beneficial impacts to project proponents that were previously unable to obtain permits. Any take of golden eagles would need to be offset with compensatory mitigation, which may be relatively costly for small developments. As the number of incidental take permits applications from both existing and future projects would likely increase, in the short-term permit issuance could be delayed due to Service staffing issues, especially as no permits have previously been issued for golden eagle take east of the 100th meridian.

Incidental Take Permits

The action alternatives would lessen uncertainty for developers by clarifying that take be reduced to the maximum degree practicable. That , plus the establishment and promotion of conservation banks, in-lieu fee programs, and other third-party arrangements as an alternative to developing individual mitigation measures for each project would likely increase the number of incidental take permit applications and issued permits. An overall increase in applicants could delay permit issuance as the Service adjusts to the increase in applications from both existing operators and future developers, including for golden eagle take permits east of the 100th meridian. However, in the long-term the permit process would become more streamlined by tiering from this programmatic analysis for future NEPA analyses associated with individual permits.

Clarified and more standardized compensatory mitigation requirements would allow companies to more accurately estimate costs for offsetting mitigation and properly allocate needed funds. Having more certainty and more accurate cost estimates upfront could allow these to be negotiated as part of any project finance contract or agreement, instead of potentially shouldering additional costs in the future.

Revisions to the eagle rule would be less likely to affect electric utility companies which are often able to raise large amounts of capital for large-scale, long-term projects. Many are well-established companies with consistent revenue streams and relatively high levels of investment equity from funds and individuals alike.

Permit Application Processing and Amendment Fees for Commercial Entities

The action alternatives would include an increase in the permit application processing fee and amendment fee for commercial entities under both eagle incidental take permit regulations and eagle nest take permit regulations for permits up to but less than 5 years. In both cases, the application fee would increase from $500 to $2,500 and the amendment fee would increase from $150 to $500. The proposed fee would recover a larger portion of the actual cost to the Service, including technical assistance provided to the potential applicant by the Service prior to receiving the actual permit application package. For homeowner permits, the fees would remain the same, even though Federal agencies are directed to recoup the full costs of processing permits. The Service estimates that fewer than 100 entities would be subject to these increased fees, including for renewing or amending permits. A small percentage of these businesses may initially find the fee increase a financial burden, for most, the increase would not represent a significant cost of doing business. Commercial entities generally recoup these types of business-related costs by passing them on to customers.

Societal Impacts

It is outside the scope of this PEIS to conduct a contingent valuation survey to estimate the WTP for eagles as a result of the proposed revisions. However, all the action alternatives are designed to reduce actual take by encouraging more permit applications for take that otherwise would not be minimized or offset by mitigation.

3.8.2.4 Alternative 2: Current EMUs, Liberal Take Levels

Higher unmitigated take levels for bald eagles under this alternative would benefit eagle permit applicants, when compensatory mitigation is not required but would cause minor to moderate, adverse impacts to recreational and aesthetic values associated with eagles. Those impacts would be due both to the perception that total (authorized and unauthorized) take would increase and therefore the bald eagle population would decline, and to the actual, long-term effects of less compensatory mitigation being implemented, including habitat-based mitigation. In actuality, the bald eagle population would not be expected to decline; if bald eagle take levels were reached, there is an approximately 50% chance that take might exceed the actual sustainable level at the population objective, but it is unlikely that demand for bald eagle permits would be high enough to approach the liberal take levels under this alternative, except in the southwest EMU.

3.8.2.5 Alternative 3: Current EMUs, Conservative Take Levels

Although lower than Alternative 2, Alternative 3's increased unmitigated take levels for bald eagles (from current levels) would likely cause minor adverse impacts to recreational and aesthetic values associated with eagles due to the perception that bald eagle population would decline. Extending the maximum duration to 30 years also is likely to result in the perception that incidental take permits would allow some industries to take a greater number of eagles without sufficient oversight, despite the provisions for reassessing fatality rates, effectiveness of measures to reduce take, the appropriate level of compensatory mitigation, and eagle population status at five-year intervals. Conservationists and birdwatchers and other appreciators of wildlife and eagles in particular could perceive the extended tenure as compromising eagle populations. As such, minor adverse impacts could occur aesthetic values associated with eagles.

Extending the maximum duration of incidental take permits to 30 years would create beneficial impacts to applicants for long-term infrastructure, renewable energy, and public infrastructure projects with regard to a project finance because the 30-year permits would more closely match the long-term contracts between buyers and sellers. This would better equip developers to negotiate capital expenditures and maintenance and operation costs into the terms of the financial agreement.

Some smaller wind projects may be less likely to request long-term permits given the administration fee of $15,000 every five years. The significantly lower processing fee for applications for permits of less than five years ($500) compared to five years or more ($36,000) might further dissuade smaller wind projects from requesting a 30-year permit.

In the short-and long-term, electric utilities would benefit under Alternative 3. The application of existing APLIC guidelines to a specific project location would enable projects to qualify for long-term incidental take permits.

3.8.2.6 Alternative 4: Flyway EMUs, Liberal Take Levels

As with Alternative 2, higher unmitigated take levels for bald eagles under Alternative 4 would benefit eagle permit applicants, when compensatory mitigation is not required. However, under Alternative 4, codification of the LAP analysis into the regulations, along with the modified preservation standard, could result in increased compensatory mitigation requirements for some permittees, which could be minor and adverse to most entities to whom this requirement would apply, but could be moderate for smaller entities. On the other hand, requests to permit take that exceeds the LAP are expected to be relatively rare.

The higher unmitigated take levels would cause minor to moderate, adverse impacts to recreational and aesthetic values associated with eagles. Those impacts would be due both to the perception that total (authorized and unauthorized) take would increase and therefore the bald eagle population would decline, and to the actual, long-term effects of less compensatory mitigation being implemented, including habitat-based mitigation. In actuality, the bald eagle population would not be expected to decline; if bald eagle take levels were reached, there is an approximately 50% chance that take might exceed the actual sustainable level at the population objective, but it is unlikely that demand for bald eagle permits would be high enough to approach the liberal take levels under this alternative, except in the southwest EMU.

The additional compensatory mitigation requirements that would result from codification of the LAP analysis into the regulations and the modified preservation standard, could ameliorate the adverse effects to recreationists and those who to whom eagles have particular existence value, particularly eagles in their locality.

3.8.2.7 Alternative 5: Flyway EMUs, Conservative Take Levels (Preferred Alternative)

The adverse and beneficial potential impacts discussed under *Section 3.8.2.3, Impacts Common to All Action Alternatives; Section 3.8.2.5, Alternative 3; and Section 3.8.2.6, Alternative 4* would be combined under this alternative. Adverse socioeconomic impacts would likely be moderate under this alternative for small projects if higher costs of compensatory mitigation due to the greater than 1:1 compensatory mitigation ration for golden eagle take and the compensatory mitigation that may be required based on take exceeding the LAP take limit cannot be absorbed or it takes several years to be amortized. Small or new companies (with projects sited in an area with high risk to eagle mortality) may not have the capital to absorb or amortize compensatory mitigation costs, therefore adverse impacts could be significant for those companies. Effects to larger companies and companies that can site outside of areas where their projects have a high level of risk to eagles would be adverse, but minor.

The long-term beneficial effects to eagles from increased mitigation requirements for golden eagle take permits; the added protection of eagle populations at the local scale; and the increased permit coverage and associated conservation measures resulting from availability of long-term permits would have moderate to major beneficial impacts to those who value eagles and eagle habitat aesthetically and recreationally.

3.9 CLIMATE CHANGE

3.9.1 Affected Environment

Scientific research published in peer reviewed journals and synthesized by groups such as the Intergovernmental Panel on Climate Change (IPCC) and the U.S. Climate Change Science Program depicts a global climate that is changing. The following elements of climate change are known with near certainty (IPCC, 2014):

- Human activities are changing the composition of Earth's atmosphere. Increasing levels of greenhouse gases, like carbon dioxide (CO_2) in the atmosphere since pre-industrial times, are well-documented and understood.
- The atmospheric buildup of CO_2 and other greenhouse gases is largely the result of human activities such as the burning of fossil fuels.
- An "unequivocal" warming trend of about 1.0 degrees to 1.7 degrees Fahrenheit occurred from 1906-2013. Warming occurred in both the Northern and Southern hemispheres and over the oceans. The major greenhouse gases emitted by human activities remain in the atmosphere for periods ranging from decades to centuries. It is virtually certain that

atmospheric concentrations of greenhouse gases will continue to rise over the next few decades.

- Increasing greenhouse gas concentrations tend to warm the planet.

In addition to increases in global average air temperatures, the IPCC reports that the earth's warming trend has also resulted in increases in global average ocean temperatures, widespread melting of snow and ice, and rising global average sea level. There have also been changes in precipitation patterns. Furthermore, the IPCC concluded that it is very likely that over the past 50 years, cold days, cold nights, and frosts have become less frequent over most land areas, and hot days and hot nights have become more frequent. According to the IPCC, however, it is uncertain how much warming will occur, how fast that warming will occur, and how the warming will affect the rest of the climate system including precipitation patterns.

Climate change has already had observable effects on the environment. Glaciers have shrunk, ice on rivers and lakes is breaking up earlier, plant and animal ranges have shifted and trees are flowering sooner. Effects that scientists had predicted in the past would result from climate change are now occurring: loss of sea ice, accelerated sea level rise and longer, more intense heat waves.

Scientists have high confidence that global temperatures will continue to rise for decades to come, largely due to greenhouse gasses produced by human activities. The IPCC, which includes more than 1,300 scientists from the U.S. and other countries, forecasts a temperature rise of 2.5 to 10 degrees Fahrenheit over the next century. According to the IPCC, the extent of climate change effects on individual regions will vary over time and with the ability of different societal and environmental systems to mitigate or adapt to change.

The changing climate impacts society and ecosystems in a broad variety of ways. Impacts that are currently visible throughout the U.S. and will continue to affect these regions are summarized below (USGCRP, 2014a; EPA, 2014).

- <u>Northeast:</u> Heat waves, heavy downpours, and sea level rise pose growing challenges to many aspects of life in the Northeast. Infrastructure, agriculture, fisheries, and ecosystems will be increasingly compromised.
- <u>Northwest:</u> Changes in the timing of streamflow reduce water supplies for competing demands. Sea level rise, erosion, inundation, risks to infrastructure, and increasing ocean acidity pose major threats. Increasing wildfire, insect outbreaks, and tree diseases are causing widespread tree die-off.
- <u>Southeast:</u> Sea level rise poses widespread and continuing threats to the region's economy and environment. Extreme heat will affect health, energy, agriculture, and more. Decreased water availability will have economic and environmental impacts.
- <u>Southwest:</u> Increased heat, drought, and insect outbreaks, all linked to climate change, have increased wildfires. Declining water supplies, reduced agricultural yields, health impacts in cities due to heat, and flooding and erosion in coastal areas are additional concerns.

- Midwest: Extreme heat, heavy downpours, and flooding will affect infrastructure, health, agriculture, forestry, transportation, air and water quality, and more. Climate change will also exacerbate a range of risks to the Great Lakes.
- Great Plains: Projected increases in temperature and more frequent droughts will further stress the region's primary water supply, the Ogallala aquifer. Changes in water availability are likely to present challenges to agriculture and key wetland habitats, such as prairie potholes.
- Alaska: Over the past 50 years, Alaska has warmed twice as fast as the national average. Warming is contributing to the thawing of Alaska's permafrost. Warming is contributing to the loss of protective sea ice along Alaska's northwestern coast, leading to increased rates of coastal erosion. Warming is altering marine and terrestrial ecosystems, causing changes in the extent and location of habitat for fish and wildlife.

Blunden et al. (2011) documented 2013 as among the ten warmest years on record, with 2012 as the warmest for the U.S. Further, they report that atmospheric CO_2, methane, and nitrous oxide all continued to increase in 2013. As in previous years, each of these major greenhouse gases once again reached historic high concentrations.

U.S. Global Change Research Program (USGCRP, 2014a) reported average temperatures are projected to increase by about 4.5° F in the U.S. by the 2080s. Warming temperatures projected for the next 50-100 years will result in declines in forest growth and agricultural crops. Sea level rise poses widespread and continuing threats to both natural and built environments and to the regional economy. Increasing temperatures and the associated increase in frequency, intensity, and duration of extreme heat events will affect public health, natural and built environments, energy, agriculture, and forestry.

Increased temperatures are expected to cause shifts in seasonal prey availability for birds and change the phenology (synchronicity) of breeding or migratory species. Climate change may alter energy requirements and food availability for overwintering eagles (Harvey et al., 2012). For example, long-term climate change may affect air temperatures, wind velocity, cloud cover, and precipitation, all of which influence eagle energy demands. Changes in river temperatures and flows may affect the abundance and accessibility of salmon carcasses, which overwintering eagles feed upon. Also, regional climate change models predict substantial site-to-site variability in future air temperatures, precipitation, cloud cover, and wind speeds due to local factors such as topography, snow cover, and land–water contrasts. Because eagles are mobile and opportunistic predators, poor overwinter feeding conditions in one area may lead them to seek alternate prey or move to other areas where feeding conditions are more favorable.

3.9.2 Environmental Consequences

The CEQ's Revised Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions advises that actions subject to NEPA compliance should be evaluated along two dimensions relative to climate change impacts: (1) the effects of GHG emissions from a proposed action and alternative actions on global climate change; and (2) the effects of climate change to a proposed action or alternatives, including the relationship to proposal design, environmental impacts, mitigation and adaptation measures (CEQ 2014).

This PEIS considers activities that would be permitted as a result of the proposed action to be connected activities. These can be analyzed here at the programmatic level for their potential to impact GHG emissions and, thus, climate change. Additional NEPA compliance would be evaluated based on an individual project's parameters.

3.9.2.1 Impacts of the Proposed Action on Climate Change

Since neither the No Action alternative nor any of the action alternatives would directly produce emissions or emissions reductions, there would be no direct impacts to climate change, either adverse or beneficial, from the alternatives. However, in an informal review in 2014 of programmatic permit requests across the U.S., the Service found that a clear majority of programmatic permit requests (16 of 23) were from wind facility developers; the remainder were from electric utilities (three for transmission lines) or Department of Defense (three for training activities), and one for other construction activities (USFWS, 2014a). Therefore, to the extent that the changes in permitting regulations lead to an increase in the replacement of current or future fossil-fuel based energy supplies with wind energy, indirect benefits to climate change (that is, benefits that occur later in time than the issuance of the permit itself) could occur in the form of avoided or reduced GHG emissions. In the global context of climate change, these potential beneficial impacts are likely to be minor at most because 1) in general, the eagle permit does not authorize the activity itself but only the impacts to eagles from the activity, so only a very small number, if any, of planned wind projects are terminated altogether because they would be unable to obtain eagle take permits; and 2) even taken together, wind energy facilities that apply for and obtain eagle permits would offset a very small relative proportion of global emissions, but with the potential for cumulative significance in the context of other national and international efforts to mitigate or avoid further climate warming.

Other projects that could require long-term eagle take permits include electricity transmission lines, and other energy development like solar, oil and gas, hydropower, or geothermal, construction of major pipelines, and long-term operational maintenance of major infrastructure, such as highway systems. Collectively, these project types are expected to represent the minority of long-term eagle take permit requests in the foreseeable future, well behind wind energy. While any individual project would need to be evaluated by the project proponent for its potential to emit greenhouse gases and thus contribute to climate change, it is not expected that the new regulations would lead to more such projects. Other activities that might require short-term permits include: new transportation projects, and residential and commercial development; but impacts on climate that can be attributed to eagle take authorization are at most negligible. In sum, there would likely be no impacts to climate change from the No Action or action alternatives.

The only differences in the magnitude of potential beneficial impacts on climate change among the alternatives would be if one alternative might lead to an incrementally higher number of new wind projects. Alternatives 3 and 5, which propose extending the maximum permit duration to 30 years, could produce these impacts. *Section 3.8, Socioeconomic Resources* discusses this issue in detail.

3.9.2.2 Impacts of Climate Change on the Proposed Action

Climate change is itself a cumulative impact of multiple human activities. Climate change influences vegetation, water, and disturbance frequencies, and these changes, in turn, influence one another. A change in one aspect causes a cascade of responses that in some cases counteract, and in others magnify, the initial change. Such interactions make prediction of the likely effects of climate change difficult at particular locations even if the nature of the climate change is known.

Sections 4.2, 4.3, 4.4, and *4.5* consider the cumulative effects of climate change on the ecosystem components that determine bald and golden eagle sustainability. At this point it is certain only that changes will occur, but the mode, timing, or magnitude of changes or environmental responses, even at a regional scale, cannot be known. The impacts of climate change will become part of the ongoing process undertaken by the Service to monitor the population and habitat conditions for bald and golden eagles, with resulting adjustments to the parameters of bald and golden eagle management, including the regulations that define the permit program.

CHAPTER 4: CUMULATIVE IMPACTS

4.1 CUMULATIVE ACTIONS CONSIDERED FOR BALD AND GOLDEN EAGLES

Where permits for "disturbance take" and limited "take resulting in mortality" (50 CFR 22.26) and/or "nest take" (50 CFR 22.27) are under consideration, analysis of the environmental effects of permit issuance is required under NEPA, including cumulative effects. Cumulative effects are defined as: *"the incremental environmental impact or effect of the proposed action, together with impacts of past, present, and reasonably foreseeable future actions"* (40 CFR 1508.7; 50 CFR 22.3), and include direct as well as indirect effects. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (40 C.F.R. 1508.8 (b)). The temporal scale for analysis of reasonably foreseeable future actions extends for the predicted duration of the impacts of indirect and cumulative actions, not just for the duration of a project or permit. Additionally cumulative effects address the effects of past, present, and reasonably foreseeable future actions in bald eagle and golden eagle breeding home ranges, foraging habitat for all age classes, and "important eagle use areas" as defined in 50 C.F.R. 22.3. Analysis may include impacts to habitat that may occur on or near Federal, State, and private land which may have direct, indirect, and cumulative effects associated with and/or exacerbated by a broad suite of threat factors (i.e. including, but not limited to mortality and disturbance).

Not all of the individual adverse impacts, especially to habitat, may be construed as 'take' under the Bald and Golden Eagle Protection Act, but they may still have cumulatively significant adverse impacts to populations. These impacts should be analyzed in order to meet responsibilities under the BGEPA, NEPA, MBTA, and Executive Order 13186.

4.1.1 Poaching

Eagles were once shot for bounties, and were killed wantonly during 'shoot-offs' (i.e., recreational events to eliminate eagles during lambing or calving season, or events to determine who could shoot the most eagles in an amount of time) (Dale 1936, Palmer 1988). Theoretically shooting of both species of eagle should have ended with inclusion under the Bald and Golden Eagle Protection Act in 1940 (bald eagle) and 1962 (golden eagle). This is not the case, however. Beecham and Kochert (1975) indicated that four (11 percent) of their study sample were illegally shot. Franson and Russell (2014) determine that illegal shooting was among the top four causes of death among eagles submitted to the National Wildlife Health Center from 1975-2013; however because many of the necropsied eagles were opportunistically found and sent to the laboratory, this may not be entirely representative of this cause of death. In a more representative contemporary sample of satellite-tagged eagles, USFWS (2016) estimate that approximately 1,000 golden eagles are being illegally shot each year in the U.S., roughly 17% of all mortality. Fatality by illegal shooting adds to annual cumulative loss of bald eagles and golden eagles at an unknown, but likely high rate.

Trapping using animal parts as bait is a legal method to take furbearers over much of the U.S., and because bald eagles and golden eagles scavenge for carrion, permitted trapping is of concern for take of both species where its range overlaps with desired furbearers. Trapping of furbearers using snares, leg-hold traps, and strychnine sets designed to kill offending predators has been a known cause of death of golden eagles, historically and present day (Katzner et al., 2012). Bycatch of bald eagle and golden eagles was reported incidental to furbearer trapping in Eastern Canada (USFWS, 2010b), with nearly 300 cases for a 26 year period in Quebec, Canada (G. Fitzgerald, Université de Montréal, personal communication). Bald eagle and golden eagles have also been reported as trapping bycatch in the U.S. (Bortolotti, 1984; Russell and Franson, 2014). Bortolotti (1984) noted that female eagles appeared more prone to incidental trapping than males. The annual quantity of eagles killed or injured as 'bycatch' in the U.S. has not been calculated; but is considered to be an ongoing threat where furbearer trapping is practiced (USFWS, 2010b).

Poaching is a factor in past, present, and foreseeable future cumulative impacts on the impact topics considered in this PEIS. Based on past and continuing trends, the potential for poaching to be a future cumulative action is high.

4.1.2 Lead Poisoning

Lead metal has been amply documented to show negative effects to raptors, including eagles (Lumeij, 1985; Franson, 1996; Kramer and Redig, 1997; Wayland et al., 1999; Pattee and Pain, 2003; Wayland et al., 2003; Church et al., 2006; Fisher et al., 2006; Hunt et al., 2006; Cade, 2007; Pain et al., 2007; Gangoso et al., 2009; Watson et al., 2009; Stauber et al., 2010; Kelly et al., 2011; Pagel et al., 2012; Franson and Russell, 2014; Langner et al., 2015). Bald eagles and golden eagles in most areas of their range are exposed to food sources with expended lead bullets (e.g., from varmint shooting, offal piles, non-recovered game, contaminated and weakened live prey, and other sources) (Hunt et al., 2006), which are ingested and result in lethal and sub-lethal lead levels (Pattee et al., 1990; Kelly et al., 2011; Franson and Russell 2014). Even in areas of Southern California within the range of the California condor where lead bullets for rifles has been restricted, lead has been found at levels which negatively impact individual raptors (Kelly et al., 2011). Eagles with sub-lethal lead burdens may not die immediately, and can suffer for long periods after exposure (Kramer and Redig, 1997). Lead and brodifacoum poisoning of raptors can induce golden eagles and other raptors to become extremely thirsty, and with lead poisoning, ungainly and clumsy. Chronic sub-lethal lead exposure has potential to debilitate both species of eagles and induce starvation, increased susceptibility to disease, predation, injury (including drowning in stock tanks), decreased reproductive success, and increased potential for electrocution and/or impact with structures and vehicles (Kramer and Redig, 1997; Craig and Craig, 1998; Kochert et al., 2002). Cade (2007), Hunt et al. (2006), Kelly et al. (2011), Pagel et al. (2012), and Franson and Russell (2014) provide further examples of lead effects on eagles and their behavior.

Finklestein et al. (2012) suggests that California Condors may never recover without the removal of lead ammunition from available prey. Golden eagles may be similarly affected since they are facultative scavengers over a large portion of the year and in comparable habitat. Bald eagles have been impacted by lead for decades in Midwestern and Eastern States (Russell and Franson, 2004).

Lead poisoning is a factor in past, present, and foreseeable future cumulative impacts on the topics considered in this PEIS. Based on past and continuing trends, the potential for lead poisoning to be a future cumulative action is moderate to high.

4.1.3 Poisoning

Poisoning of bald eagles and golden eagles has the potential to occur throughout their entire range, and can impact local and regional populations by affecting reproductive success and behavior. Poisoning is estimated currently to cause 17% of golden eagle deaths per year (USFWS, 2016). Nearly 26% of deaths of bald eagles necropsied at the National Wildlife Health Laboratory between 1975 and 2013 were attributed to poisoning (Russell and Franson, 2014).

Mercury has been a concern in raptor poisoning, however published works are limited and results suggest mercury has had limited impact on golden eagles (Langner et al., 2015) but is of concern for bald eagles. Mercury generally enters the food chain via atmospheric deposition from coal-fired energy production originating in Asia and the United States (Eisler, 1987, Corbitt et al., 2011), and can create neurochemical impacts in both species, but with more published examples regarding bald eagles because their being top-order predators in mainly aquatic ecosystems where mercury contamination appears to be more prevalent (Wiemeyer et al., 1993, Rutkiewicz et al., 2011).

Anticoagulant rodenticides, especially second generation bodifacoum rodenticide has become more ubiquitous on the landscape and have poisoned diurnal and nocturnal raptors (Elliott et al., 2014, Rattner et al., 2014). Brodifacoum is a long-acting anticoagulant rodenticide that interferes with normal blood clotting. At present, there are no established lethal or sublethal concentrations of this rodenticide for birds. Rodenticide poisoning, while often targeting small mammals (i.e., rats and mice) not often used by eagles as prey, still remains a concern for eagles throughout their range due to the species scavenging behavior. The use of landfills by eagles is not uncommon (Turrin et al. 2015), where eagles can contact phenobarbital when they have fed on veterinary-euthanized pets discarded in un-covered landfills (Millsap et al., 2004; USFWS, 2010c). Selenium has been attributed to impede bald eagle productivity in the Great Lakes region (Bowerman et al. 1994). Other contaminants including but not limited to PCB congeners, PDBB, DDE, DDD, DDT-relate compounds (see 4.1.10), have been attributed to impacting eagle reproduction. While mortalities caused by poisoning are often rare events and sparse in the published literature, locating a dead or dying eagle which has been poisoned, is extremely rare. Because eagle carcasses are often found by chance in decomposed condition, discerning the true impact of rodenticides is difficult at best.

The following contaminants continue to be a concern for bald eagles and golden eagles[1]:

- Bromadiolone
- Chlorophacinone
- Coumachlor
- Diphacinone
- Warfarin
- Zinc Phosphide
- Lead
- Manganese
- Iron
- Mercury
- Arsenic
- Molybdenum
- Zinc
- Copper
- Cadmium
- Brodifacoum
- Difenacoum
- Coumatertralyl
- Strychnine
- Avitrol
- Starlicide
- Organophosphates
- Carbamates
- Barbiturates
- NSAIDS

[1] *USFWS unpublished data*

4.1.4 Climate Change

Climate change by itself, does not cause eagle mortality or nest abandonment. Climate change is likely to exacerbate existing threats including invasive plants, disease, habitat loss, and can affect migration routes (and overflight habitat), breeding territories, and wintering habitat. The terms “climate” and “climate change” are defined by the Intergovernmental Panel on Climate Change (IPCC). “Climate” refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007). The term “climate change” thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative and they may change over time, depending on the species and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007).

Long term habitat changes caused by climate change have strong potential to affect the carrying capacity of the landscape for eagles by impacting abundance and distribution of prey populations. Harvey et al. (2012) modeled climate change impacts to overwintering bald eagles, and noted that a warming climate caused less salmon carcass biomass to be available as a food resource. They suggest warming winters and denser wintering populations of bald eagles will require them to seek alternative prey. This type of indirect change to prey populations may have long-term impacts to nesting and dispersal/wintering habitat, and may affect conditioning of adult females prior to nesting (Harvey et al., 2012).

The El Nino Southern Oscillation (ENSO) appears to be impacted by climate change, and as such, has brought changes in patterns of rainfall in xeric habitat. Rainfall has been shown to be highly correlated with lagomorph abundance in the Chihuahuan desert (Lightfoot et al., 2010). Schloss et al. (2012) note dispersal abilities of mammals, including lagomorphs and most sciurids, will be a limiting factor to their response to climate change. Under conservative climate change scenario predictions, lagomorphs, depending on species, have a low to high vulnerability to climate change, and may require assisted migration (Schloss *et al.* 2012). Lagomorphs are cyclic in population abundance (Fedy and Doherty, 2011), and with the added complexity of increased drought in highly variable xeric habitat (mountain ranges which are miles apart can have very different annual rainfall patterns due to ENSO), reductions in numbers of this favored prey of golden eagles can be expected with the result being a decrease in overall reproductive success and survival of young in desert regions of the U.S.. Bald eagles found in xeric habitat in the U.S. Southwest may be impacted by the loss of breeding habitat caused by reduction in precipitation, resulting in loss of open water habitat available to foraging. Baldwin et al (2012) suggested that long term changes in bald eagle prey and decreasing trend in reproductive occupancy in coastal southern Florida have been a result of significant ecological changes and cascading events caused by higher summer temperatures and hyper-salinity in the local environment.

Climate change may subtly impact behavior or reduce reproduction in wide ranging species. Declines in counts at migration stations of migrating golden eagles have been reported in most areas in the western United States (Farmer *et al.* 2008; Smith *et al.* 2008), although Millsap et al. (2013) presented evidence these changes may be more the result of changes in migration pattern than changes in population size. For example, golden eagles may be shortstopping, (i.e., not migrating as far south as in prior years due to warmer winters) due to climate change, increased prey availability, or availability of more northerly wintering habitat.

McIntyre (2012) suggested, following analysis of telemetry data from a sample of Alaskan golden eagles, that starvation may be of a larger concern than previously indicated via data from incidentally found banded (no telemetry) mortalities. Indeed, USFWS (2016) showed that starvation is the leading cause of death for golden eagles overall (24% of annual deaths), and it primarily affects first-year individuals. While starvation may be perceived as a natural process and a driver for natural selection, changes in landscape patterns through anthropogenic activity, increased and broader scale of drought, and changes in prey base caused by shifting ecosystems may increase the potential for this threat to golden eagle populations.

Climate change has also changed fire frequency directly and indirectly throughout most of the range of golden eagle. To date, no information has been accumulated on the effects of fire on golden eagles, either through direct take, or temporary or permanent habitat loss and conversion. However, golden eagles typically build stick nests on cliffs or alternatively in trees. Because of the flammable nature of those nests, and the habitat which surrounds nests, uncontrolled wildfire can induce loss of nests, and, because eagles may have chicks during what would be considered fire season for most habitat, mortality of pre-fledge chicks. These instances of loss are not easily tracked by the Service.

Impacts from fire may result in the loss of nesting substrate or impact to foraging habitat and prey populations. It is unknown how many eagles and eagle nests are affected by wildfire each year; however changes in wildland fire cycles, increase of invasive plants, and extended drought are believed to be altering wildfire intensity and spatial area (Tidwell, 2013). Kochert et al. (1999) found that when scrubland habitat was burned, eagle nesting territories were lost and adjoining territorial eagles subsumed the previous habitat; resulting in fewer overall occupied nesting territories. While golden eagles may have up to 18 nests/territory, the loss of significant nests, extant or potential nest trees, or changes to the habitat may affect eagle retention and annual breeding (Kochert and Steenhof, 2012). This, in turn, can have an impact on retention of golden eagle territories, prey availability within territories, availability of nesting substrate, and an overall impact on short and long-term retention of territories. Changes in fire frequency and impact to nesting tree availability may have a long-term deleterious effect on golden eagle nesting and foraging habitat throughout much of their range.

Weather extremes appear to be, on average, increasing in the Western Hemisphere (see Seneviratne *et al.,* 2012), and based on prior observation of weather extremes impacting golden eagles, it is reasonable to predict that increased impacts caused by storms, wind, heat, and cold may occur throughout the species range. Eagle chicks can die of heat prostration; Beecham and Kochert (1975) noted that of 41 eaglets that died prior to fledging, 17 died of heat prostration. Phillips et al. (1990) noted mortality of eagle chicks that died of cold, i.e., induced by late season storms. Millsap et al. (2004) reported weather-related deaths reduced fledging success of bald eagles in rural areas of western Florida. Death of young eagles could be exacerbated by the effect of weather extremes. Steenhof et al. (1997) noted that the number of territories in their study area laying eggs was inversely related to weather severity. Eagles with abundant prey and in good health can better withstand temperature extremes.

Climate change is a factor in past, present, and foreseeable future cumulative impacts on the impact topics considered in this PEIS. Based on past and continuing trends, the potential for climate change to be a future cumulative action is high.

4.1.5 Loss and Fragmentation of Eagle Habitat

In areas of the contiguous United States, loss of nesting, foraging, and protective roosting habitat has been attributed to be a source of loss of nesting territories, removal of suitable foraging habitat, and is a continuing concern for the population stability for both eagle species (Kochert et al., 2002; USFWS, 2010c). Habitat loss can be due to climate change, invasive vegetation, wildfire-caused habitat conversion, energy- and housing-development, agricultural transition and increased livestock presence, recreation, and roadway construction/highway expansion. All of these have impact on available foraging habitat, and suitable nesting locations, either quickly over days or months, or incrementally over years and decades. Human presence at varying levels on landscapes within the range of bald eagle and golden eagle is ubiquitous in the contiguous United States, and is increasing in Canada and Alaska. These human impacts can reduce, incrementally, the amount of habitat, and ostensibly the prey availability, which eagles use during all life stages; i.e., breeding, wandering dispersal prior to adulthood, movements to acquire a territory, and movements of territorial adults within their home range and during years of non-breeding (Newton, 1998).

Differences in behavior between bald eagle and golden eagles creates varying responses to habitat loss and temporal/spatial disturbance. Bald eagles appear less impacted by anthropogenic presence than golden eagles, and thus can persist on landscapes with higher levels of human presence (Buehler, 2000). Habitat loss in areas with bald eagles appears to have negligible impacts, as bald eagle populations have increased since the 1960's (USFWS, 2016) despite habitat loss. This tolerance may not be universal, however. For example, Anthony et al. (1995) reviewed indirect and direct impacts of increased human presence related to bald eagles in relatively undisturbed areas of the Pacific Northwest; they showed that repeated short-term disturbance had potential to impact longer term fitness, survival and reproductive success. At the other extreme, Millsap et al. (2004) showed bald eagles that occupied nesting territories in highly disturbed human residential developments in Florida had positive population growth rates. Millsap et al. (2004) attributed this to behavioral adaptations in the face of high prey densities in the urban and suburban areas.

Habitat loss and resulting impacts on golden eagles is less well known. Landscape development for recreation, energy production (and related activities), electricity transmission infrastructure, road construction, etc., all have the potential to fragment prey populations, and reduce the availability of foraging habitats due to increased anthropogenic impacts, including disturbance. Increases in human presence in remote areas due to hiking, camping, rock-climbing, energy development, and off-highway vehicles has the potential to reduce, or in some instances limit the nesting potential and reproductive success of golden eagles. Steidl et al. (1993) found when observers were camped approximately 400 meters from nests of golden eagles, adults spent less time near their nests, fed their young less frequently, and fed themselves and their young up to 67% less food than when observers were camped 800 meters from nests. In studies of golden eagle populations in the southwest (New Mexico and Texas) and the Front Range of the Rocky Mountains in New Mexico, Colorado and Wyoming, Boeker and Ray (1971) reported that human disturbance accounted for at least 85% of all known nest losses for their study of 706 nesting attempts over a multi-year period.

Disturbance is often local in nature, but cumulatively loss of nesting opportunities and production of young can have an impact on local and regional eagle populations. Disturbance to eagles during the breeding season can lead to temporary or permanent abandonment of nesting territories, loss of young and overall reduction of reproductive success. Golden eagles have been noted to be sensitive to some forms of anthropogenic presence (Palmer 1988). Golden eagles avoid nesting near urban areas (Kochert et al., 2002). Individuals will occasionally nest near semi-urban areas where housing density is low and in ranch and farmland habitat. Golden eagles are extremely 'skittish' and generally avoid human contact when possible (Palmer 1988), and are "*shy and retiring by nature*' (Dixon 1937:55). High nestling mortality can occur due to overheating, chilling or desiccation when young are left unattended by adults reacting to human intrusion (Boeker and Ray 1971, Suter and Jones 1981).

Habitat destruction is a factor in past, present, and foreseeable future cumulative impacts on the impact topics considered in this PEIS. Based on past and continuing trends, the potential for habitat destruction to be a future cumulative action is high.

4.1.6 Energy Production

Industrial scale oil and gas production, and commercial scale facilities for wind and solar energy production are ecologically recent features on the landscape. Oil and gas production, ranging from small remote wells to large production facilities, started to be more widespread at the turn of the 19th century. Wind power has been used at smaller scales in the United States since the 1600s for grain grinding, sawmills, electricity and pumping water for agriculture (Righter 1996) and a large-scale turbine was used in the 1800s in Vermont to generate electricity before it was blown over (Manville 2005). Ecological impacts can occur with fossil fuel and wind energy production **(**Kuvlesky et al. 2010**,** Jones and Pejchar 2013**)**. Mortality of wildlife from fossil fuel energy production include death of birds at evaporation ponds and reserve pits, flare tubes, lethal effects from contamination and habitat fragmentation from pads, roadways pipelines and related infrastructure (Riley et al. 2012, Jones and Pejchar 2013). Smith et al. (2010) showed substantial negative effects on golden eagles of oil and gas development in Wyoming and Utah. Mortality of wildlife from wind energy production includes impacts with meteorological towers and support guywires, blade strikes, altered bird movement and habitat use, and habitat fragmentation caused by tower supports, roadways, transmission wires, and related infrastructure (Manville 2005). Mortality of wildlife at solar facilities results from impact trauma with panels, heliostats, and solar troughs; heat prostration and dehydration of grounded birds; singing and immolation of birds mid-flight; altering bird movement and habitat use; and habitat fragmentation caused by solar fields, roadways, gen-tie, and transmission wires (Kagan et al., 2014**,** Manville, 2016).

Following a resurgence in the need for alternative energy in the U.S. by the 1970s, commercial scale wind power electrical generation were planned and established primarily in California in the early 1980s (Braun and Smith 1992). By 1990, California wind facilities were responsible for over 76% of the world's total wind energy production, including those at Altamont Pass, Tehachapi and San Gorgino (Braun and Smith, 1992). Federal (EPACT 2005, EO 13423) and State mandates have increased the use of alternative energy and subsequent Federal and State energy subsidies were made available to project proponents in the early 2010s. The number of wind resource areas and wind turbines has increased to nearly 66 gigawatts by 2015 (DOE, 2016a), and is projected to be 20% of electric energy production in the US by 2030 (DOE, 2016b). At present, approximately 90% of open applications for eagle take permits are for wind resource areas. Due to technological advances, wind energy facilities have expanded in geographic scope to encompass numerous wind resource areas (WRAs) in the contiguous United States. The trend for proposed wind generation projects in the United States and the continental distribution of bald eagles and golden eagles suggests overlap and the growing potential for mortality between eagles and wind projects. Wind energy can directly and indirectly impact birds, including raptors and more specifically eagles (Hunt et al., 1997; Hunt et al., 1998; Smallwood and Karas, 2009; Noguera et al., 2010; Loss et al., 2013; Pagel et al., 2013; Smallwood, 2013; Zimmerling et al., 2013; Marques et al., 2014; Hunt and Watson, 2016).

In 2013, the USFWS generated conservation plan guidance for land-based wind energy (USFWS, 2013a). The availability of take permits, and the USFWS's need to assess the population-level effects of permitted actions, has greatly increased the necessity for understanding the spatial and numerical extent of existing and potential eagle mortality from wind turbine blade strikes.

The exact number of bald and golden eagle killed annually at wind facilities is unknown because many facilities are not monitored to determine take rates, and most of those that do, do not or have not provided information to the USFWS (Pagel et al., 2013). Despite this, Pagel et al. (2013) showed that wind-turbine deaths of bald and golden eagles had been documented at least at 35 wind-energy facilities besides Altamont in 14 states. The number of bald eagles and golden eagles reported killed by Pagel et al. (2013) at non-Altamont wind facilities likely substantially underestimated the number of eagles killed at wind facilities throughout the United States. While Pagel et al. (2013) reported fewer bald eagles killed at wind facilities than golden eagles, this does not necessarily mean that there is less potential for deaths at wind facilities among bald eagles (Mojica et al., 2009). Reasons for lessened impacts to bald eagles is not clear, but were speculated by Pagel et al. (2013) to be related to fewer wind facilities near dense bald eagle populations, or related to lower carcass recovery rates at Midwestern and Eastern wind facilities. As further evidence of the potential for impacts to bald eagles, wind-farm deaths of the closely related white-tailed eagle (*Haliaeetus albicilla*) at one facility in Norway resulted in the near-extirpated a local breeding population (Nygaard et al., 2010).

Energy production is a factor in past, present, and foreseeable future cumulative impacts on the impact topics considered in this PEIS. Based on past and continuing trends, the potential for energy production to be a future cumulative action is high.

4.1.7 Power Lines

Electrocution is considered to be one of the primary known causes of mortality of birds (Loss et al., 2014a) and raptors (Lehman, 2001; Lehman et al., 2007). Electrocution is known to impact bald eagles and golden eagles throughout their range (Russell and Franson, 2014; USFWS, 2016). Electrocution of golden eagles throughout their range in western North America has accounted for at least 25 percent of the discovered mortalities (Kochert et al., 2002). Beecham and Kochert (1975) noted that electrocution was responsible for 12 (43 percent) of the golden eagle mortalities in their study. Benson (1981) found that in a sample of 416 eagle carcasses in six Western States, of 51 eagle carcasses fresh enough to determine cause of fatality, 41 were found to have been electrocuted. Hunt *et al.* (1998) indicated that 17% out of a sample of 179 telemetered golden eagles were killed by electrocution. Unitt (2004) indicated that 37 of 55 golden eagles were killed by electrocution in Southern California from 1988 to 2003. Harness and Wilson (2001) documented at least 272 electrocutions deaths of golden eagles in North America from 1986 to 1996. Millsap et al. (2004) found that electrocution was one of two leading causes of death of satellite-tagged bald eagles in Florida, and Mojica et al., (2009) noted that line strikes and electrocutions are a major source of bald eagle mortality in the Chesapeake Bay area. Russell and Franson (2014) found that of the carcass submissions to the National Wildlife Health Center from 1975 – 2013, 17% of their sample of 753 eagles were found to have been killed by electrocution; 372 bald eagles (12.5% of bald eagle deaths) and 381 golden eagles (27% of golden eagle fatalities). Most recently, USFWS (2016) estimated that about 500 golden eagles die annually in the U.S. from electrocution, accounting for 8% of all deaths.

The Avian Power Line Interaction Committee (APLIC and USFWS, 2005; APLIC, 2006) has developed comprehensive guidelines to reduce electrocution-related mortality of many birds. Nevertheless, electrocution remains (USFWS, 2014b) one of the Service's biggest concerns to long-term maintenance of golden eagle populations, as noted in eagle conservation plan guidance for compensatory mitigation planning (USFWS, 2013a). While power companies, linemen, and others related to the electrical infrastructure in the U.S. know how to prevent raptor and eagle electrocutions, the application of short and long term changes to electrical transmission and distribution poles and lines has not occurred at a broad scale within the U.S. Additionally, under Alternative 5 in particular, and to some extent under each of the action alternatives, compensatory mitigation may include measures to expedite the rate by which utility companies upgrade existing infrastructure, thereby facilitating the reduction of power line electrocutions and collisions for the both eagle species.

Injury or mortality by collisions with utility wires is also well documented in Canada and the U.S. (Rioux et al., 2013, Loss et al., 2014a). APLIC, in turn, recently updated best practices (APLIC, 2012) to better address bird collisions. Collisions with utility wires have not historically been considered a significant cause of mortality or injury of eagles, however recent studies of satellite-tagged eagles suggest this factor may account for more deaths of both species than previously thought (Mojica et al., 2009; USFES, 2016). Because most new or existing utility lines and infrastructures are not monitored for line strikes for large or small birds, overall impact to eagles is unknown. Golden eagles and other raptors have been impacted by new or existing utility wires, raising this mortality threat as a concern (Drewitt and Langston, 2008, Drewitt et al., 2008). This can be especially true in areas where newer lines are constructed within and near eagle foraging habitats (Mojica et al., 2009).

Power lines are a factor in past, present, and foreseeable future cumulative impacts on the impact topics considered in this PEIS. Based on past and continuing trends, the potential for power lines to be a future cumulative action is moderate to high.

4.1.8 Collision with Aircraft

Using the Federal Aviation Administration Wildlife Strike database (Dolbeer et al., 2013), U.S. Air Force Bird Strike database (Zakrajsek and Bissonette, 2005), and the U.S. Navy, Washburn et al (2015) tabulated that there were at least 234 reported eagle collisions with aircraft from 1990 – 2013. Washburn et al (2015) calculated that aircraft collisions with bald eagles had increased by 2200% during the 24 year period; collisions with golden eagles increased 400%. Washburn et al. (2015) found that airstrikes with eagles were mostly with civilian aircraft (197), and only 37 were with military (U.S. Air Force and U.S. Navy). Bald eagles were more likely to be hit by aircraft, with 200 reported strikes; 173 with civilian aircraft, and 27 military. Bald eagles strikes occurred mostly in Alaska and Florida. Golden eagles were struck in 27 different incidents, with 17 strikes by civilian aircraft and 10 military; all airstrikes were reported in Western States, with almost half of those strikes reported in California. Golden eagles are sometimes indifferent to civilian and military overflight, which could lead to collisions for flights not related to reconnaissance and surveillance at nests (Grubb et al., 2010).

Airstrikes of bald eagles is a growing concern and a rising safety issue for pilots and passengers (Dolbeer, 2009; Dolbeer and Eschenfelder, 2003; Washburn et al., 2015). As the bald eagle population has increased post recovery, air strikes have concurrently increased in regions with higher concentrations of eagles (e.g., Alaska, Florida, and Chesapeake Bay). As eagles are large-bodied birds, hazards to pilots and passengers correspondingly increase (Dolbeer and Eschenfelder, 2003). To reduce potential for strikes, airfields (commercial and military) will increasingly aggressively attempt to reduce or eliminate flying and perching eagles in the proximity of the landing field, and all flight paths as most air strikes were below 1000 feet above-ground-level (Washburn et al., 2015). This will likely incur more proactive management, including nest removal, active site abatement, and lethal take to reduce the abundance of bald eagles and golden eagles near airfields (USDA, 2005; Washburn et al., 2011).

Overall, collisions with aircraft themselves may be relatively rare, and thus have low potential for adverse cumulative impacts on bald or golden eagle numbers.

4.1.9 Vehicle Collision

Roadway collisions are a considerable source of mortality for wildlife worldwide (Trombulak and Frissell, 2001). Both bald eagle and golden eagle fatalities are not uncommon (Phillips, 1986; Millsap et al., 2004; Hunt et al., 1998; Loss et al., 2014b; Russell and Franson, 2014). Mortality occurs often after eagles are attracted to roadsides and train tracks by dead deer, elk, and other live or dead wildlife. Because of their inability to take off quickly, eagles may try to fly down or near open corridors to gain adequate speed to attain a safe elevation from oncoming vehicles, or fly perpendicular across the roadway when startled. Phillips (1986) found nearly 1,000 eagles killed on highways in Wyoming during one winter. Millsap et al. (2004) documented more suburban bald eagles fatalities from anthropogenic factors (primarily electrocution and vehicle collision) than rural counterparts, though most fatalities occurred in rural areas after dispersal from natal territories.

Hunt *et al.* (1998) noted in a telemetered sample of 179 golden eagles near Altamont, three eagles were killed by vehicles over the course of their 4 year study. Russell and Franson (2014) found that of the carcass submissions to the National Wildlife Health Center from 1975 – 2013, 24.2% of their sample of 753 eagles were found to have been killed by trauma (mostly vehicle collisions); 681 bald eagles (22.9% of bald eagle deaths) and 384 golden eagles (26.9% of golden eagle fatalities). Overall, collisions from all sources (vehicle, line-strikes, and turbine blade strikes) are estimated to kill about 500 golden eagles annually (about 9% of all golden eagle deaths; USFWS, 2016). USFWS (2013a) noted that efforts within areas of high known eagle highway fatalities to keep roadsides clear of carrion and may reduce eagle mortality resulting from vehicle collisions, thus constituting a potential viable compensatory mitigation strategy.

Vehicle collision is a factor in past, present, and foreseeable future cumulative impacts on the impact topics considered in this PEIS. Based on past and continuing trends, the potential for vehicle collision to be a future cumulative action is moderate to high.

4.1.10 DDT Contamination

The primary cause of the peregrine falcon and bald eagle population decline in North America from the 1940's through the early 1970's was contamination from a commonly used pesticide, DDT and its subsequent bio-accumulated metabolite, DDE (Ratcliffe, 1967; Hickey and Anderson, 1968; Bitman et al., 1970; Grier, 1982; Nisbit, 1989; USFWS, 2007b). DDT is metabolized to form DDE, which blocks calcium deposition on the outer layer of eggshells, causing thinning, shell pore size and density variation, and subsequent breakage and/or death of raptor embryos (Ratcliffe, 1967; Hickey and Anderson, 1968; Bitman et al., 1970; Peakall, 1970; Anderson and Hickey, 1972; Miller et al., 1976). Bald eagle populations declined substantially until DDT was banned in 1972 (Grier, 1982, USFWS, 2007b). Bald eagles still have some levels of DDE in their systems, but because of the U.S. ban of DDT, DDE levels have dropped significantly, thereby allowing for a successful recovery in all areas of its range in North America. Golden eagles were not impacted at comparable demographic levels due to differences in diet; DDE did not concentrate to the same levels in the mammalian food chain compared to levels among prey fish and birds (Newton, 1998). This resulted in golden eagles having levels of DDT/DDE in their eggs in Western States that did not seem to impair reproductive success (Ellis, 1979).

At this time, DDT/DDE levels in both species have become negligible. Thus, DDT contamination is a factor in past, cumulative impacts on the topics considered in this PEIS, but the potential for present or future cumulative action is low.

4.1.11 Disease

Extant and emerging diseases can have impacts on eagles. Disease outbreaks are often limited to instances when single or multiple eagles are collected, and are fresh enough where diagnostic tools can be used to discern morbidity. Russell and Franson (2014) found few diagnosable instances where infectious disease could be discerned. In their sample of 763 eagles submitted to the National Wildlife Health Center, only 5% of bald eagle remains, and 3% of golden eagle remains could be correlated with an infectious disease. Aspergillosis, avian pox, *Staphylococcus* sp., septicemia (origin unknown), avian cholera (pasteurellosis) and West Nile virus were determined to be the primary causes of disease induced mortality, with aspergillosis diagnosed to have killed 35 bald eagles and 15 golden eagles (Russel and Franson, 2014).

Avian vacuolar myelinopathy (AVM) has also been discerned to have killed at least 100 bald eagles in Southeastern U.S. states (Thomas et al., 1998; Rocke et al., 2002; Wilde et al., 2005). This disease and the cyanobacteria with which it has been associated appear to be present in some Southeastern U.S. reservoir ecosystems that support the invasive aquatic plant hydrilla (*Hydrilla verticillata*; Wilde et al. 2005). Because of the wide range and extant of this disease outbreak, combined with the likely continued expansion of hydrilla, suggests that additional bald eagles could be killed in the future.

Unexpected disease outbreaks have potential to kill eagles massed during winter foraging at concentration areas near water or other food sources. For example, at least 27 bald eagles in Utah were killed in 2013 by West Nile Virus that was remnant in concentrations of avian prey.

It should be expected that bald eagles will die in larger quantities in future events when they are massed near waterfowl populations that may have avian cholera, avian pox, aspergillosis, or AVM. Golden eagles are also susceptible to disease, however because of their propensity to be in remote areas at low densities, disease is not expected to cause the same level of mortality.

Based on past and continuing trends, the potential for disease to be a future cumulative action for bald eagles is high, and for golden eagles somewhat lower.

4.1.12 Summary of Cumulative Impacts for Eagles and Eagle Habitat

Because of their complex ecology, bald eagles and golden eagles are subject to a myriad of threats each day. These include, but are by no means limited to background contamination by lead bullets from offal and small mammals, exposure to rodenticides, electrocution caused by perching on a utility line, striking objects in pursuit of prey, or persecution by individuals who don't like eagles or who want eagles for their feathers. Other threats which may cause mortality or disturbance include starvation, trapping, drowning in water tanks, wildfire, researcher impacts, habitat loss (including fragmentation), disturbance, recreation, climate change, disease, changing prey distribution and abundance, weather extremes, and energy production. All of these threats individually and cumulatively could cause substantial impact to local, regional and continental populations of both species of eagle.

In areas with little human presence, for example remote areas of the U.S., both eagle species must contend with other eagles, peregrine falcons, inclement weather, climate change, prey fluctuations, wildfire accidents, and disease/parasites. Availability of food, followed by suitable nesting locations, are drivers of drive eagle populations (Newton, 1979). Body condition levels in breeding females during courtship affects breeding success each year, and territories with low prey levels may be abandoned or infrequently used (i.e., eagles are present but do not breed) for up to over a decade or more (Kochert et al., 1999; Kochert and Steenhof, 2012; Watts, 2015).

Because of their complex life history including long distance movements during all life stages, eagles must run a gauntlet of natural threats, in combination with the direct and indirect anthropogenic threats outlined in this chapter. As human populations increase and more habitat is lost to agriculture, housing, and energy developments, urbanization, wildfire, and fragmentation, eagles have less of the natural, undisturbed habitats in which they evolved.

Assessing impacts of cumulative risk factors is difficult at best. Assessments may underestimate risks if the activities are situated in highly productivity “source” habitats, which are often responsible for much of the annual fecundity of a raptor population (Newton, 1998). Effects may also be exacerbated if they result in segments of the population becoming isolated from each other. These latter cumulative effects may even occur when none of the individual effects have incurred ‘take’ under the Bald and Golden Eagle Protection Act. It is also important to note that some of these activities are not solely harmful in their effects, and in some cases may ultimately prove to be benign or even beneficial. For example, high prey densities in urban wetlands in Florida support population growth in bald eagles (Millsap et al., 2004), and the proliferation of highway road kills, livestock carcasses, and expanding white-tailed deer

(*Odocoileus virginianus*) populations in the eastern U.S. have increased food for golden eagles (though perhaps not to the extent that declines in native prey are offset).

Overall, these combined factors have not negatively affected the potential for population growth in bald eagles, as evidenced by the trends reported by USFWS (2016). However, cumulative factors may be contributing to possible ongoing or future declines of golden eagles. For golden eagles, the evidence suggests that current high levels of mortality are having a bigger impact on populations than other factors (USFWS, 2016). Considering cumulative factors is an important aspect of the eagle permit analysis, and the LAP assessment that would be required under Alternatives 4 and 5 (optional under the remaining Alternatives) serves in that capacity by compiling information on, and analyzing, ongoing take in proximity to a prospective permit. Thus, the LAP analysis allows the Service to formally account for the most important of these impacts when assessing future take authorizations.

4.2 Migratory Birds

4.2.1 Lead and Mercury Poisoning

Lead metal has been amply documented to show negative effects to multiple species of migratory birds, including terrestrial birds, waterfowl and raptors (Bellrose, 1959, Redig, 1979, Eisler, 1988, Kendall et al., 1996, Kramer and Redig, 1997, Fisher et al., 2006; Hunt et al., 2006, Cade, 2007.) Impacted birds ingest lead shot, fragmented or whole bullets, or lead fishing weights, and incur lead toxosis (Scheuhammer and Norris, 1996; Eisler, 1988, see also 4.1.2). Lead that is ingested results in lethal and sublethal lead levels to terrestrial birds, waterfowl, and raptors (Redig, 1979; Pattee et al., 1990; Franson and Pain, 2011; Kelly et al., 2011; Franson and Russell, 2014); sublethal levels impact behavior, including feeding, breeding, and movement.

Mercury cycling in aquatic ecosystems is a concern for upper trophic-level shorebirds and piscivorous waterbirds over much of the U.S. and territories (Heinz, 1979; Olendorf et al., 1988; Zilloux et al., 1993; Evers et al., 2008; Eagles-Smith et al., 2009). See 4.1.3 for additional details.

4.2.2 Climate Change

Individual, species, and guild level impacts of climate change to birds in North America are becoming apparent (Carey, 2009). Refer to 4.1.4 for additional background on climate change.

While some migratory bird species may benefit from climate change, many will not. Climate change will alter breeding, foraging, migration and wintering behavior and habitat for migratory birds of all guilds through a myriad of cascading events and feedback loops (Crick, 2004; Carey, 2009). Some of these changes will involve subtle to wholescale habitat and vegetation shifts not only on the microcosm level, but with whole ecosystems shifting to higher latitudes and upper elevations, resulting shifts in distribution of insect and plant foods and avian diseases (Inouye et al., 2000; Parmesan and Yohe, 2003; Walther et al., 2002). In some areas of the U.S., climate change could result in wholescale vegetation change through insect infestations, stand-replacing wildfires, and local and regional extinctions of key habitat components (Small-Lorenz et al., 2013). Long-term droughts, variation in traditional precipitation patterns (snow, rain, monsoonal periods, storms, wind regimes, etc.), heat-waves, and extreme weather events would have incremental impacts to entire life cycle and corresponding age classes of birds (McKechnie and Wolf, 2009). These in turn could lead to changes in migration phenology and foster shortstopping behavior as species react to changing migration corridors (Cotton, 2003; Jenni and Kéry, 2003; Emberg et al., 2014; see also discussion in 4.1.4 for a contemporary example with the golden eagle).

4.2.3 Habitat Destruction

Human-caused habitat loss, conversion, and degradation impacts migratory birds throughout the U.S. (Andren, 1994; Goss-Custard et al., 1995; Sutherland, 1996). Refer to 4.1.5 for additional background.

Most habitat changes impacting nesting, roosting, foraging and migration habitat of birds occurs incrementally, yet some populations may not possess genetic or behavioral flexibility needed to adapt to habitat loss. Populations may be affected when evolutionary niches are destroyed or degraded, leading to population reductions (Dolman and Sutherland 1995, Sutherland 1996). Large scale habitat loss caused by utility scale energy production (Sovacool 2009), anthropogenic habitat conversion, or habitat degradation influenced or impacted by climate change (Opdam and Wascher, 2004) can cause permanent conversion of large expanses of suitable habitat in short ecological periods (Logan and Powell, 2001; McKinney et al., 2009). Studies of population declines of multiple species of birds show population stability can be influenced by loss of nesting, migration, or wintering habitat (Newton, 1998). Loss of habitat can affect annual productivity through reducing pre-breeding condition, increasing nest-predation rates, and reducing survival of young. Loss and fragmentation of migration and wintering habitat can impact survival (Robbins et al.,1989; Barrow et al., 2000; Jiguet et al., 2007).

Migration pathways for some birds are fixed, whereas others have broad-scale migration patterns and use different pathways each migration based on age/sex, weather, nutritional needs, and final destination. Loss of habitat, or creation of barriers at flight height (e.g., wind energy facilities, communication towers, urbanization), along migration routes can have subtle or overt impacts on individual fitness and potentially the status of a population (Meyers 1983; Robbins et al., 1989; Barrow et al., 2000; Mabee and Cooper, 2004; Manville, 2005; Barclay et al., 2007; Jiguet et al., 2007; Manville 2016).

4.2.3 Energy Production

Fossil fuel, wind and solar energy production, and their interrelated and interdependent actions have direct and indirect impacts on migratory birds. Each form of energy production may have different deleterious impacts to birds through habitat conversion, blunt force trauma of hitting wind tower blades or solar panels/heliostats/solar trough, or fossil fuel infrastructure during energy production. Refer to 4.1.5, and 4.1.6 for further information related to energy production.

As noted in 4.1.6, energy production (fossil fuel, wind, and solar) can cause mortality of migratory birds (Osborn et al., 2000; Manville, 2005; Drewitt and Langston, 2006; Smallwood and Karas, 2009; Kuvlesky et al., 2010;, Noguera et al., 2010; Riley et al., 2012; Jones and Pejchar, 2013; Loss et al., 2013; Smallwood, 2013; Zimmerling et al., 2013; Kagan et al., 2014; Marques et al., 2014; Manville, 2016). The number of birds impacted by energy development is unknown. Each form of energy production may have disproportionally high fatalities with certain guilds of species. For example, high numbers of raptors and passerines are struck by turbine blades during migration and forage flights (Mockrin and Gravenmier, 2012; Smallwood, 2013; Marques et al., 2014); waterbirds and other long distance migrants are killed through blunt force impact trauma and/or immolation at industrial scale solar facilities (Kagan et al., 2014; Manville, 2016); and waterfowl, raptors, and sagebrush steppe birds are impacted by habitat fragmentation and loss, and other sources through fossil fuel energy production (Braun et al., 2002; Ingelfinger and Anderson, 2004; Gilbert and Chalfoun, 2011; Fuller, 2013; Jones and Pejchar, 2013).

4.2.4 Power Lines

Power lines continue to be a source of numerous fatalities of migratory birds through electrocution and blunt force impact trauma. Refer to 4.1.7.

Loss et al. (2014a) reviewed data from comparative studies on electrocution and collision fatalities of birds, and found evidence to suggest 12 to 64 million birds are killed by transmission and distribution lines in the U.S. each year. Further analysis indicated that between 0.9 and 11.6 million were killed annually by electrocution, and 8-57 million were killed annually by collision. Rioux et al. (2013) found a similar magnitude of estimated fatalities of birds in Canada, with a range of 2.5 to 25.6 million birds killed per year. Vulnerable birds that appear most at risk to collisions with transmission lines include waterfowl, waterbirds (grebes and cranes), and shorebirds, but Rioux et al. (2013) suggest that raptors and waterfowl fatalities via power lines may be increasing. Electrocutions caused by power distribution lines not built or maintained to APLIC (2012) standards continue to be a concern in the U.S. for raptors (Bevanger, 1994; Lehman, 2001;, Lehman et al., 2007). Impacts of birds at communication towers (towers and guywires) appear to be comparable to fatalities caused by power lines in type and gross numbers (Kerlinger, 2000; Manville, 2000).

4.2.5 Collision with Aircraft

Aircraft colliding with birds has been a problem for the safety of pilots and for birds since aircraft first flew (Thorpe, 2003; Dolbeer, 2013). The Federal Aviation Administration has noted that avian collision with aircraft is a growing safety issue as commercial and military air flights increase in the U.S. (Dolbeer and Eschenfelder, 2003; Dolbeer, 2009; Dolbeer et al., 2013). In addition to safety, the economic losses due to bird strikes and costs of bird-strike prevention is increasing in parallel to the increase in overall bird strikes (Allen, 2000; Allen and Orosz, 2001; Dolbeer, 2009; Dolbeer, 2013). Refer to 4.1.8 for additional information.

Most birds that migrate or fly in open habitat at heights above ground to the maximum recorded levels which birds fly are subject to collision with civilian or military aircraft (Zakrajsek and Bissonette, 2005; Dolbeer, 2006;, Dolbeer et al., 2013; Washburn et al., 2013). Programs around airports exist to reduce the number of birds that may be impacted by aircraft (Martin et al., 2011; Van Belle et al., 2007). Dolbeer et al. (2013) suggest that bird strikes in the U.S. have increased by almost 6 times from 1990 to 2012. The scale of avian fatalities caused by aircraft incidents, and resulting impact to bird populations is currently little known.

4.2.6 Vehicle Collision

Vehicle collisions with birds appear to one of the most numerous causes of fatality of birds in North America (Trombulak and Frissell, 2001; Bishop and Brogan, 2013; Loss et al., 2014b). See 4.1.5. for more information. Estimates of the gross number of birds killed by vehicles in Canada was about 3,462 birds killed per 100 km, or approximately 13,810,906 birds killed per (Bishop and Brogan, 2014). Loss et al. (2014b) suggested between 89 and 340 million birds are killed on U.S. roadways, per year, or an estimate of 19.4 – 98.5 birds killed per kilometer each year (median = 48.8). At present, there is limited information as to if vehicle collisions are impacting bird populations in the U.S., either overall or for individual species (Bard et al., 2001).

4.2.7 DDT Contamination

DDT and its metabolite DDE impacted raptors and several piscivorous water birds in the United States from the mid 1940's through the latter portion of the 20th century, following its U.S. ban in 1972 (see 3.2.1.2 for more background on DDT). Mechanisms of delivery and impacts of DDE/DDT are discussed in 3.2.1.2 and 4.1.10. Besides bald eagles, peregrine falcons, osprey, and brown pelicans were impacted by the world-wide use of DDT. Their populations have increased, with peregrine falcons being removed from the U.S. Endangered Species List in 1999, brown pelicans removed in 2000, and osprey were never listed, yet their populations have recovered in many areas to pre-DDT levels (Bierregaard et al., 2014). Analysis of blood levels post-recovery suggest the metabolite DDE has decreased significantly in migrant peregrine falcons (Henny et al., 2009). DDE has been recently been determined to cause eggshell thinning in California condors, who have acquired this contaminant from the fatty tissues of scavenged marine mammals on the Pacific Coast (Burnett et al, 2013). This has caused concern in because of the already limited wild reproductive success of California condors.

4.2.8 AVM Disease

Avian Vacuolar Myelinopathy (AVM) is known to impact raptors, and other species of waterbirds including primarily American coots. AVM is discussed in 4.1.11. Several species of ducks, shorebirds, and raptors besides American coots and bald eagles have been impacted by AVM, however not to the extent of these two species (Thomas et al., 1998; Rocke et al., 2002; Wilde et al., 2005). At this time, this disease is restricted to reservoirs in the U.S. Southeast states, and besides the deaths of at least 100 bald eagles and many American coots, does not appear to be impacting populations of other species.

4.2.9 Conclusions

Migratory birds are impacted by multiple stressors in the United States and other MBTA signatory countries. As shown above, these stressors can vary per species, region, and time of year, in addition to differing between sex and age classes of a species. Perturbations in natural and human modified environments impact nesting, roosting, foraging, migration, and wintering habitat of many bird species. Further, human- and climate-change related alterations in ecological and predator/prey relationships are negatively impacting many species of birds.

Major stressors affecting survival include vehicle strikes (car/truck, and aircraft); pesticides and other contaminants (lead, mercury, DDT/DDE); and disease (as shown by AVM). The effects of these factors may be exacerbated by climate change.

The cumulative impacts of stressors mentioned above may be increased by the activities facilitated through issuance of the eagle permits that are the subject of this PEIS. These impacts, largely restricted to individual migratory birds and to a lesser degree their populations, will occur as a result of fatalities/injuries and loss and degradation of habitat at facilities and locations where eagles are authorized to be 'taken' under permit.

4.3 Other Permitted Take

The cumulative effects evaluation for other permitted take (OPT) primarily considers the potential for the factors noted in *Section 4.1, Cumulative Actions Considered*, to add to the impacts of the proposed alternatives and therefore require modification of permit limits or conditions. The analysis, therefore, is driven by the Service's projected ability to continue to meet its eagle management objectives, discussed in *Sections 4.2, Bald Eagle; 4.3, Golden Eagle*; and *4.4, Eagle Habitat* above.

Cumulatively, the Service does not expect changes or appreciable impacts to the continuation or magnitude of OPT of eagles from any of the alternatives for the reasons discussed in *Section 3.6, Other Permitted Take* primarily because the level of OPT included in the baseline exceeds the levels of reported OPT from 2010-2014.

Since the Service's decision to grant an incidental take permit is ultimately driven by whether the permitted activity would impose a cumulative adverse effect on eagle management objectives, the analysis of cumulative impacts is similar to the impact analysis for the proposed and alternative actions. Therefore, the considerations that could create cumulative impacts to the categories of OPT are:

- *Changes in the prioritization criteria for granting permits* − giving high priority to specific types of resource development activities could crowd out other permitted take requests. As discussed in *Section 3.6.2, Environmental Consequences*, the relatively low level of actual permit demand for collecting, depredation, and nest take for resource recovery makes this unlikely, but it is worth noting that changes in priorities are an important consideration.
- *Changes in permit demand* − activities in the cumulative scenario that could increase permit demand include wind resource development, aircraft collisions (including hazing), land conversion for development, and waterfront development. In addition, as discussed in *Section 3.6.2.3, Alternative 3: Current EMUs, Conservative Take Levels*, the extension of maximum permit duration to 30 years could induce more permit applications. Increased permit demand is one potential factor that could lead to negative changes in population trajectories, but given the overall complex of factors affecting eagle populations, it is a relatively minor factor compared to those listed in *Section 4.1*. Negative population trajectories over time could hasten re-evaluation of the baseline for take. Such re-evaluation of the baseline would be subject to NEPA compliance.

- *Changes in the efficacy of mitigation* − improvements and innovations in mitigation or avoidance of take could lead to increased permit demand, since all eagle take permits would require offsetting mitigation. Potential applicants might thus be encouraged to pursue activities that would take eagles. This could lead to further take that could ultimately threaten population objectives, and thus reductions in baseline and limit levels of take.

While the analysis of impacts in *Section 3.6.2, Environmental Consequences* concluded that there was no difference in impacts to other permitted take between the liberal and conservative take limits (because under both take approaches demand for take was likely to remain below baseline, where limits do not apply), the cumulative impact could be different between the two. That is, the higher (liberal) take limit is more likely to lead to negative population trajectories over time that force re-evaluation of the baseline, by having authorized more eagle take and causing, or at least accelerating, eagle population pressures. Here, the liberal limit would not cause this to happen; rather, under the liberal limit, it is somewhat more likely to happen, although the application of LAP analysis could reduce that likelihood.

4.4 CULTURAL AND RELIGIOUS ISSUES

Impacts to eagle populations from the wind industry, power lines, DDT, climate change, poaching, AVM disease, aircraft collisions, and lead and mercury poisoning could create additive cumulative impacts with further authorized or unauthorized take of wild eagles to those whose cultural value depends on the existence of wild eagles. Benefits to EAIRT permittees could be compromised when considered cumulatively because compensatory mitigation would not occur for unauthorized causes of eagle mortality or illegal take (lead and mercury poisoning, improper disposal of euthanized livestock, etc.). It is unlikely that the issuance of EAIRT permits would be delayed or otherwise affected adversely, as the Service prioritizes issuance of EAIRT permit. Additive cumulative impacts could also occur if the maximum duration for incidental take permits is extended and if the action alternatives lead to more facilities operating under permits, because the increased monitoring and collection requirements would likely lead to an increased supply of eagles at the NER and decreased waiting times for tribal members.

As the wind industry continues to grow, the likelihood of incidental permit issuance for development in or near a TCP could increase. Additive impacts could occur under all action alternatives, and are most likely to occur under alternatives 3 and 5 with any increase in projects being built as a result of increased permit tenure. For projects in which the eagle permit is the only federal nexus or undertaking, this increase in permit coverage of projects would lead to analysis of affected TCPs under the NHPA that would not have been otherwise analyzed or accounted for. While the availability of EAIRT permits would not be affected, cumulative emotional or spiritual impacts could occur to Native American tribes or individuals. Similar additive impacts could occur with the installation of more power lines in response to a growing U.S. population and industrial expansion. However, under all the alternatives in the DPEIS, power line retrofitting to substantially reduce injury and mortality of eagles is an integral tool both for permitting electric utilities, and for addressing take from other permitted sources. The effect of the emphasis on power line retrofits is likely to be beneficial to eagles because of the overall reduction in take resulting from electricity distribution. Where power lines are not retrofitted, the cultural Impacts could be felt by any tribe or individual whose cultural value depends on the existence of wild eagles, but also include conservationists or anyone who might perceive increased take rates of the bald eagle as compromising the nation’s symbol.

4.5 Socioeconomic Resources

In the long-term, federal subsidies or incentives could have either additive or subtractive effects on the project financing of real estate development, transportation, public utility, dam, and renewable energy projects. For example, without the Renewable Energy PTC, the future of the wind industry would be at risk and some wind generation facilities could be unable to continue operations. PPAs may include provisions that allow one or both parties to terminate the PPA prior to the commercial operation date if the PTC is not available. If the PTC continues its “on-again, off-again” history, this cycle could continue to stunt the long-term growth of the wind industry due to the boom and bust cycle. The “boom” occurs while the PTC is firmly in place, and in the years leading up to the PTC's expiration. The “bust” occurs during lapses in the PTC and causes a dramatic slowdown in the implementation of planned wind projects and layoffs at wind companies and manufacturing facilities (UCS, 2015). In the case of emerging markets such as wind energy, regulations incentivizing investment in renewables, whether with tax credits or by establishing renewable energy goals, would have additive cumulative impacts.

Currently, many of the original equipment manufacturers (OEMs) producing wind turbines are based overseas, and many domestically based OEMs manufacture major turbine components outside the U.S. Much of the initial investment for a wind project (wind turbines represent the majority of capital expenditures) would currently not benefit the local economy for a specific project. However, many foreign OEMs are localizing production in the U.S. in order to take advantage of the growing market, reduce transportation costs, minimize the risks associated with currency fluctuations, ease logistical challenges associated with exporting large turbines and components, and avoid import duties (BLS, 2010). A decrease in capital expenditures would cause the DSCR to be higher, providing more flexibility to absorb or amortize compensatory mitigation costs. This could reduce the adverse effects the proposed revisions could have on small wind developers below the limit of significance. Indirect cumulative benefits would occur if most or all of the construction dollars were spent in the local or state economy of the project.

Cumulative effects to electric utilities as a result of the action alternatives are difficult to estimate and depend largely on the status of deregulation of the sector and the entry of new utility players. Electricity companies are evolving in response to regulatory changes, demand fluctuations, price volatility, and new competition. In general, the electric utility industry would benefit from the codification of offsetting mitigation requirements. In addition, funding from permittees for offsetting mitigation could be used to fund retrofitting problem power poles of non-permitted companies. While non-permitted electric utilities would be responsible for the monitoring and maintenance of these poles, the majority of the cost would be paid for by eagle permittees. With their problem power poles now retrofitted at another’s expense, these non-permitted utility companies are also at lower risk of an enforcement action resulting in another potential benefit to electric utilities.

With a growing U.S. population, industrial expansion, and public demand for more electricity, it is possible that utility companies will continue to operate without implementing compensatory mitigation for the take of eagles. It is also possible that the proposed revisions will encourage existing utility companies to obtain 30-year incidental take permits; or that new utility players decide that existing companies previously weighed the perceived financial burden of delay too heavily against the very real risk of costly prosecution. The latter two scenarios would have additive, beneficial impacts as more companies would operate without the financial risk of fines or criminal prosecution.

Overall, if project financing for utility and wind companies continues to suffer as a result of negative publicity related to unauthorized eagle takes, revisions to the eagle rule (in tandem with incentives, regulations, or policy changes) could have long-term, additive cumulative effects on wind and utility companies.

CHAPTER 5: SUSTAINABILITY AND LONG-TERM MANAGEMENT

5.1 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA Section 102(C) (v) requires a discussion of whether implementing the proposed action would, for any reason, irreversibly commit resources that would no longer be available for other purposes. Examples might include a commitment to consume resources such as fuel, which cannot be recycled or reused. Such a commitment is intended to be described and then compared with the benefits of the project to compare those benefits to the irreversible commitment of such resources.

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

Permits that authorize the take of eagles imply the irreversible loss of individual birds. The loss of an individual bird is irreversible in that it is killed and cannot be restored to its original condition. However, without permits that regulate the number of eagles that can be taken, a greater number of individual birds would be killed, thus potentially leading to declines in eagle populations. However, the impact to eagle populations caused by take is neither irreversible nor irretrievable given that populations are renewable resources. Overall, the revised eagle permit regulations would contribute to the protection of eagle populations from declines.

Terrestrial habitat would be lost indirectly in the long-term with the issuance of eagle take permits. However, some of the permits may stipulate compensatory mitigation via habitat conservation measures, thus reducing the potential for any irreversible and irretrievable loss of natural resources. Furthermore, habitat loss or degradation that may occur with the implementation and operation of individually permitted projects may not be an irreversible or irretrievable use of resources since decommissioning of projects and site restoration may be feasible at the end of a project’s life.

Overall, it is not expected that eagle rule revisions would result in a significant irreversible or irretrievable commitment of resources.

5.2 SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

The revised eagle rule regulations would not have any direct impacts on short-term uses of resources. Indirectly, the productivity of habitats can be negatively impacted by individually permitted projects. However, such effects would be analyzed under site-specific NEPA for projects that may tier off this PEIS. The revised rule itself would not impact long-term productivity of resources.

Habitat conservation actions across all alternatives that would be implemented as part of permit stipulations for compensatory mitigation may entail short-term negative impacts during conservation activities, but which would be implemented to ensure long-term productivity. However, such impacts, which are site-specific and of relatively short duration, would be offset by increasing the long-term productivity of the sites and surrounding plant and animal communities. Therefore, revised eagle rule regulations would not eliminate the potential for long-term productivity. No significant impacts to long-term productivity are expected to occur. It is not expected that implementation of the revised eagle rule would permanently narrow the range of beneficial uses of the human environment or adversely affect long-term productivity.

5.3 Unavoidable Adverse Environmental Effects

This section refers to those adverse effects that cannot be avoided as a result of proposed eagle rule revisions. Implementation of the proposed action is intended to move toward an overall improved condition, but some adverse environmental effects would occur.

Impacts on bald and golden eagles would be largely beneficial. However, adverse impacts on bald eagles are possible under Alternatives 2 and 4 if for whatever reason the sustainable take rate for bald eagles is overestimated, which would then exert slight downward pressure on bald eagle populations. The proposed action would not resolve the problem of unpermitted take and relatively high overall levels of anthropogenic mortality for golden eagles, which appears to exceed the sustainable take rate for this species.

There would be indirect, adverse impacts from potential loss and fragmentation of eagle habitat, and reduced habitat values and suitability during implementation of permitted projects.

There would be indirect, adverse impacts on populations of migratory birds from possible take of birds and from potential migratory bird habitat loss, habitat fragmentation, and reduced habitat values and suitability during implementation of permitted projects.

It does not appear that the take limit would impact the number of eagle permits granted for other permitted take overall. However, if the Service determines the permitted activity would take golden eagles with an effect on the population, the permit could be subject to the annual permit limits.

Delay in issuance of NARP permits could be caused by clarification of compensatory mitigation, 30-year programmatic permits, and a shift to flyway EMUs. Increased likelihood of 30-year programmatic permits issued in or near TCPs could cause indirect psychological impacts to tribes or individuals.

For socioeconomics, the cost of compensatory mitigation would be negligible for large wind projects but could be adverse for smaller wind projects. There could also be a higher likelihood of adverse impacts to visual resources and from noise.

CHAPTER 6: CONSULTATION AND COORDINATION

An EIS must be prepared when a federal government agency considers approving an action within its jurisdiction that may impact the human environment. An EIS aids federal officials in making decisions by presenting information on the physical, biological, and social environment of a proposed project and its alternatives. The first step in preparing an EIS is to determine the scope of the project, the range of action alternatives, and the impacts to be included in the document.

This PEIS has been prepared with input from and coordination with interested tribal governments, agencies, organizations, and individuals. CEQ regulations [40 10 CFR 1500–1508] require an early scoping process to determine the issues related to the proposed action and alternatives that the EIS should address. The purpose of the scoping process is to identify important issues, concerns, and potential impacts that require analysis in the EIS and to eliminate insignificant issues and alternatives from detailed analysis. Public involvement is a vital component of NEPA for vesting the public in the decision-making process and allowing for full environmental disclosure.

6.1 PUBLIC PARTICIPATION

The public participation and interagency coordination elements of the NEPA process promote open communication between the lead federal agency and other regulatory agencies, Native American tribes, stakeholder organizations, and the public. A NOI to Prepare an EA or EIS pursuant to NEPA was published in the FR (June 23, 2014 79 FR 35564). The NOI also announced the public scoping process and invited the public to participate.

6.1.1 Scoping Process

The Service planned and implemented a public input scoping process to identify issues to consider when revising the eagle nonpurposeful take permit regulations and for this NEPA effort. The purpose of scoping is to provide interested agencies, stakeholder organizations, Native American tribes, and the public an opportunity to provide comments regarding potentially significant environmental issues and the scope of the environmental analysis, including alternatives, and help to inform the eagle management program and the Service decision to prepare either an EA or an EIS. Service staff who had been implementing the 2009 eagle permit regulations identified a number of priority issues for evaluation during this scoping process, including the following: eagle population management objectives; programmatic permit conditions; compensatory mitigation; and criteria for nest removal permits.

Five public scoping meetings were held in Sacramento, California; Minneapolis, Minnesota; Albuquerque, New Mexico; Denver, Colorado; and Washington, DC between July 22, 2014, and August 7, 2014. These meetings consisted of a narrated overview video presentation and ten large informational displays with supplemental informational handouts. Representatives from the Service were available to answer participants' questions and listen to their ideas and concerns. Approximately 213 people attended the meetings, and all were encouraged to submit written comments.

The Service developed a website, http://www.eaglescoping.org where visitors could go to see the same information that was presented at the public meetings, including the overview video presentation and informational displays. Links to the Service e-mail for public comments were included on the site.

The Service received a total of 536 comments during the public comment period. Upon removal of duplicates, there were a total of 517 unique comments, of which many included additional attachments (e.g., scanned letters, one picture, and supporting documents). In addition to the comments received, two organizations provided spreadsheets with additional comments. First, the Friends of Blackwater provided a spreadsheet of 46 supporters of their comment. Secondly, the National Audubon Society provided a spreadsheet of 25,349 comments in support of their comment and 2,064 personalized comments.

Most of the comments could be categorized into eight major thematic areas:

- General comments against the killing of eagles (or for eagle protection);
- Proposed 30-year permit is too long (or keep the permit length at five years);
- Other permit length comments;
- Falconry concerns or changes to eagle take for falconry;
- Comments generally anti-wind energy facilities;
- Comments generally pro-wind energy facilities;
- A need exists for more research (or there is not enough information); and
- Form letters originating from an organization, but sent by individuals.

In addition to being part of these general themes, many of the comments contained specific recommendations for the Service to consider regarding eagles and eagle management. The full scoping report is in Appendix B.

The Service considered the scoping comments in preparing this Draft PEIS.

6.1.2 Draft PEIS Public Review Period

The Service is providing a 60-day review and comment period beginning with the publication of the Notice of Availability (NOA) of the Draft PEIS in the FR. Comments on the Draft PEIS can be submitted directly through Regulations.gov (with a link from the PEIS website: http://www.eagleruleeis.org. The public can also mail in comments to:

Public Comments processing, Attn: FWS-R9-MB-2011-0094
Division of Policy, Performance, and Management Programs
U.S. Fish and Wildlife Service, MS: BPHC
5275 Leesburg Pike, Falls Church, VA 22041-3803

The Service will consider all comments received during the Draft PEIS review period in preparing the Final PEIS.

A NOA for the Final PEIS will be published in the FR. The Final PEIS will be distributed to all individuals and parties that submitted substantive comments on the Draft PEIS and to other interested parties who request a copy of the PEIS. A Record of Decision (ROD) will be issued no sooner than 30 days following publication of the NOA for the Final PEIS.

6.2 Consultation with Government Agencies and Tribal Governments

6.2.1 Agency Consultation

Appendix C contains the list of state and federal government agencies, as well as non-government organizations, consulted.

6.2.2 Tribal Consultation

Federal agencies are required to consult with Native American tribes as part of the Advisory Council on Historic Preservation Regulations, Protection of Historic Properties [36 CFR 800], implementing Section 106 of the NHPA. Accordingly, NHPA outlines when federal agencies must consult with tribes and the issues and other factors this consultation must address. In addition, pursuant to EO 13175, executive departments and agencies are charged with engaging in regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications and are responsible for strengthening the government-to- government relationship between the U.S. and tribes.

In 2013 and 2014, the Service conducted consultation with tribes regarding eagle management and permitting actions, including revised eagle rule regulations. Table 6.2-1 lists the tribes that were consulted.

Table 6.2-1. Tribal consultation and communication on eagle management and permitting actions.

Service Region	Tribe	Date of Meeting or Letter
Region 1	Nez Perce Tribe	March 11, 2014
	Shoshone-Bannock Tribes	March 17, 2014
Region 2	Navajo Nation	November 19, 2013, December 11, 2013, and August 19-20, 2014
	Isleta Pueblo	November 25, 2013 and December 11, 2013
	Zuni Pueblo	December 11, 2013, January 21, 2014, June 12, 2014, and August 19-20, 2014
	Jicarilla Apache	December 11, 2013, January 23, 2014, and June 17, 2014
	Osage Nation	January 24, 2014
	Santa Ana Pueblo	December 11, 2013 and February 13, 2014
	Gila River Indian Community	April 15, 2014
	Iowa Tribe of Oklahoma	April 17, 2014 and August 19-20, 2014
	San Carlos Apache	April 30, 2014, June 17, 2014, and August 19-20, 2014
	Yavapai Apache	May 14, 2014
	Hopi Tribe	December 11, 2013 and June 12, 2014
	Pueblo of Laguna	December 11, 2013
	Pueblo of Cochiti	December 11, 2013
	Pueblo of San Felipe	December 11, 2013 and August 26, 2014
	White Mt. Apache	December 11, 2013, June 17, 2014, and September 24, 2014

Service Region	Tribe	Date of Meeting or Letter
	Pueblo of Jemez	December 11, 2013 and August 19-20, 2014
	Pueblo of Taos	December 11, 2013
	Mescalero Apache	December 11, 2013 and June 17, 2014
	Fort McDowell Apache	June 12, 2014
	Salt River Pima-Maricopa Indian Community	June 12, 2014
	Yavapai Prescott Indian Tribe	June 12, 2014 and June 17, 2014
	Glia River Indian Community	June 12, 2014
	Hualapai Tribe	June 12, 2014
	Tohono O'odham Nation	June 12, 2014
	Fort Sill Apache	June 17, 2014
	Tonto Apache	June 17, 2014
	Citizen Potawatomi Nation of Oklahoma	August 19-20, 2014
	Comanche Nation of Oklahoma	August 19-20, 2014
Region 3	A letter was sent to all federally recognized tribes within the region inviting them to consult with the Service. No tribes responded.	September 2013
Region 4	A letter was sent to all federally recognized tribes within the region inviting them to consult with the Service. No tribes responded.	September 2013
Region 5	Tribe of Gay Head (Aquinnah)	December 17, 2013
	Tonawanda Seneca Nation	December 17, 2013
Region 6		Webinar conducted on November 19, 2013. All tribes were invited to a meeting on March 20-21, 2014.
Region 7	ANCSA corporations	Invitation extended September 2013
	All Alaska tribes	Invitation extended September 2013
Region 8	Letters were sent to 54 tribes, followed by phone calls and emails	July, November, December 2013

6.3 LIST OF PREPARERS

This PEIS was prepared and reviewed by a team from the USFWS. A team associated with the environmental contractor Solv assisted the Service in conducting research, gathering data, and preparing the PEIS and supporting documents. Table 6.3-1 identifies team members and their roles.

Table 6.3-1. List of preparers.

Organization	Name/Title	Project Role
USFWS, Division of Migratory Bird Management	Eliza Savage, Eagle Program Manager	Contributor - All sections
	Brian Millsap, National Raptor Coordinator	Bald Eagle; Golden Eagle; Eagle Habitat
	Emily Bjerre, Raptor Program Wildlife Biologist	Contributor: Bald Eagle; Golden Eagle; Eagle Habitat
	Joel Pagel, Raptor Ecologist	Migratory Birds; Cumulative Effects
Solv	Eveline Martin, Project Manager	Contributor: Eagle Habitat; Migratory Birds
	Nathalie Jacque	Socioeconomic Resources; Cultural and Religious Issues
	Bruce Kaplan	Other Permitted Take; Climate Change; Public Involvement
	Blake Hamilton	GIS

CHAPTER 7: REFERENCES

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Chapter 8: Acronyms and Glossary

8.1 Acronyms

ACP	Advanced Conservation Practices
AHY	After-Hatching-Year
AIRFA	American Indian Religious Freedom Act
AM	Adaptive Management
ANPR	Advance Notice of Proposed Rulemaking
APLIC	Avian Power Line Interaction Committee
ARRTA	American Recovery and Reinvestment Tax Act
ATY	After Third Year
AVM	Avian Vacuolar Myelinopathy
BBL	Bird Banding Laboratory
BBS	Breeding Bird Survey
BCR	Bird Conservation Region
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO_2	Carbon Dioxide
DOI	Department of the Interior
DDT	Dichloro-Diphenyl-Trichloroethane
DM	Departmental Manual
DSCR	Debt Service Coverage Ratio
EA	Environmental Assessment
EAIR	Eagle American Indian Religious
EAIRT	Eagle American Indian Religious Take
ECPG	Eagle Conservation Plan Guidance
EIS	Environmental Impact Statement
EMT	Eagle Management Team
EMU	Eagle Management Unit
EO	Executive Order
ESA	Endangered Species Act

EST	Eastern Shoshone Tribe
ETAT	Eagle Technical Assessment Team
FAA	Federal Aviation Administration
FR	Federal Register
FTE	Full-Time Equivalent
FW	U.S. Fish and Wildlife Service's Manual
GHG	Greenhouse Gas
HCP	Habitat Conservation Plan
HY	Hatching Year
IPCC	Intergovernmental Panel on Climate Change
ITC	Investment Tax Credit
ITP	Incidental Take Permits
LAP	Local Area Population
MBTA	Migratory Bird Treaty Act
MBTRA	Migratory Bird Treaty Reform Act
MOU	Memorandum of Understanding
MSY	Maximum Sustainable Yield
MW	Megawatt
MWh	Megawatt-Hours
NAL	Native American Liaison
NAT	Northern Arapaho Tribe
NEPA	National Environmental Policy Act
NER	National Eagle Repository
NHO	Native Hawaiian Organization
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NOI	Notice of Intent
NWHC	National Wildlife Health Center
OEM	Original Equipment Manufacturers
OPT	Other Permitted Take
PBR	Potential Biological Removal

PEIS	Programmatic Environmental Impact Statement
PG&E	Pacific Gas & Electric
PPA	Power Purchase Agreement
PTC	Production Tax Credits
REC	Renewable Energy Credit
ROD	Record of Decision
ROFR	Right of First Refusal
RPS	Renewable Portfolio Standards
SDG&E	San Diego Gas & Electric
SHPO	State Historic Preservation Officer
SY	Second Year
TCP	Traditional Cultural Property
THPO	Tribal Historic Preservation Officer
TWG	Tribal Wildlife Grant
TY	Third Year
US	United States
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WTP	Willingness to Pay

8.2 Glossary

100th Meridian: A line of longitude in the United States that represents the boundary between the moist east and the arid west.

Advance Notice of Proposed Rulemaking: An Advance Notice of Proposed Rulemaking (ANPR) is a document that an agency may choose to issue before it is ready to issue a Notice of Proposed Rulemaking. The ANPR is used by an agency as a vehicle for obtaining public participation in the formulation of a regulatory change before the agency has done significant research or investigation on its own.

Advanced Conservation Practices: Scientifically supportable measures approved by the Service that represent the best available techniques to reduce eagle disturbance and ongoing mortalities to a level where remaining take is unavoidable.

Affected Environment: The components of the physical, biological, and social environment that will be affected by a proposed action or alternative.

American Indian Religious Freedom Act: A United States federal law enacted to protect and preserve the traditional religious rights and cultural practices of American Indians, Eskimos, Aleuts, and Native Hawaiians. These rights include, but are not limited to, access to sacred sites, freedom to worship through ceremonial and traditional rights, and use and possession of objects considered sacred.

Amortization: The paying off of debt in regular installments over a period of time.

Ana'í Ndáá' (Squaw Dance): A traditional Navajo ceremony to counter the harmful effects of alien ghosts or *chindi,* and has been performed for returning military personnel.

Anthropogenic Mortality: Death that is primarily caused or influence by human activity.

Ashwut maknash: Eagle killing ceremony, or the Luiseno mourning ceremony for a chief.

Bald and Golden Eagle Protection Act (Eagle Act): The Bald and Golden Eagle Protection Act prohibits anyone from "taking" bald and golden eagles, including their parts, nests, or eggs, unless authorized by the U.S. Fish and Wildlife Service.

Bird Conservation Regions: Bird Conservation Regions (BCRs) are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues.

Climate Change: Climate change is a change in the statistical distribution of weather patterns when that change lasts for an extended period of time. Climate change may refer to a change in average weather conditions or in the time variation of weather around longer-term average conditions (i.e., more or fewer extreme weather events).

Code of Federal Regulations: The Code of Federal Regulations (CFR) is the codification of the general and permanent rules and regulations published in the Federal Register by the executive departments and agencies of the federal government of the United States. The CFR is divided into 50 titles that represent broad areas subject to federal regulation.

Compensatory mitigation: Compensatory mitigation refers to conservation measures designed to improve conditions for eagles.

Council on Environmental Quality: The Council on Environmental Quality (CEQ) is a division of the Executive Office of the President that coordinates federal environmental efforts in the United States and works closely with agencies and other White House offices in the development of environmental and energy policies and initiatives.

Cumulative Effects Analysis: An analysis of the effects on the environment resulting from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal), or person undertakes such other action.

Debt/Equity Ratio: The ratio of a company's total liabilities to the amount of equity provided by stockholders.

Debt Service Coverage Ratio: The ratio of net operating income to the amount of money that is required to make regular debt payments.

Duration Rule: A 2013 regulation that extended the maximum permit tenure for programmatic eagle nonpurposeful take permit regulations from five to 30 years among other provisions. The provisions extending permit tenure were vacated following a 2015 district court decision.

Eagle Ceremony: A Cahuilla ceremony to honor a dead chief or shaman. The eagle never dies in order to ensure the clan's future.

Eagle Dance: Portrays the life cycle of the eagle from birth to death, showing how it learns to walk and eventually to hunt and feed itself and its family. It was believed to originally have been part of a larger ceremony performed to bring rain at a time of year when crops were being planted and water was essential. Bands of bald eagle feathers run the length of dancers' arms, and they imitate the movements of the eagle with turning, flapping, and swaying motions.

Eagle-Dance Ceremony: The sixth day of the Serrano, Cahuilla, Luiseño, and Gabrielino Mourning Ceremony. A dancer dressed in eagle feathers simulated the movements of an eagle.

Eagle Killing Ceremony: A Cherokee ceremony whereby sacred eagle killing was a tribal affair preliminary to the Eagle Dance. The feathers were taken but the body was left as a sacrifice to the eagle spirits.

Eagle Management Unit: The geographic scale over which permitted take is regulated to meet the population objective.

Endangered Species Act: The Endangered Species Act (ESA) of 1973 provides for the protection and conservation of species that are endangered or threatened throughout all or a significant portion of their range, and the conservation of the ecosystems on which they depend.

Environmental Impact Statement: The detailed written statement that is required by section 102(2)(C) of NEPA for a proposed major federal action significantly affecting the quality of the human environment.

Executive Order: Executive orders have the full force of law when they take authority from a legislative power which grants its power directly to the Executive by the Constitution, or are made pursuant to Acts of Congress that explicitly delegate to the President some degree of discretionary power (delegated legislation).

Falconry: The hunting of wild quarry in its natural state and habitat by means of a trained bird of prey.

Fecundity: The actual reproductive rate of an organism or population.

Federal Register: The Federal Register is the official journal of the federal government of the United States that contains government agency rules, proposed rules, and public notices.

Flyway: A flyway is a flight path used in bird migration.

Hataaii: Navajo ceremonialist.

Investment Tax Credit: Provides tax credits based on expenditures for certain types of commercial energy projects, including solar, small wind turbines, microturbines, geothermal systems, etc. placed in service before 2016.

Livestock Depredation Area: A specific geographic location in which depredation by golden eagles has been recognized. The boundaries and duration of a livestock depredation area are declared by U.S.D.A. Wildlife Services or by a state governor.

Local Area Population: Local eagle population; the Service developed guidance on upper limits of take at more local scales to manage cumulative impacts to local populations.

Mana *(alini)*: supernatural power.

Migratory Bird Treaty Act: The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg or any such bird, unless authorized under a regulation promulgated by the Secretary of the Interior.

Náádahaghaahgóó: Where Navajo ceremonies occurred or sites that may have been blessed.

Nadir: The lowest point.

Natal Dispersal: Natal dispersal refers to the movement between hatching location and first breeding or potential breeding location.

National Eagle Aviary: Established as a central clearinghouse to collect and distribute eagle parts. Eagles, parts and feathers for Native American religious purposes can be requested from the NER.

National Environmental Policy Act: The National Environmental Policy Act (NEPA) is an environmental law that requires federal agencies to analyze the effects of their actions on the environment and established the Council on Environmental Quality.

National Historic Preservation Act: The National Historic Preservation Act (NHPA) is legislation intended to preserve historical and archaeological sites in the United States of America.

Native American Eagle Aviary (Eagle Aviary) Permit: Permit authorizes tribal entities engaged in religious activities to possess lawfully acquired bald eagles or golden eagles for Indian religious use.

Native American Religious Purposes Permit: Permit available for various religious activities. The NER was established as a central clearinghouse to collect and distribute eagle parts. Eagles, parts and feathers for Native American religious purposes can be requested from the NER.

No-Net-Loss: No-net-loss means actions that either reduce another ongoing form of mortality to a level equal to or greater than the unavoidable mortality, or lead to an increase in carrying capacity that allows the eagle population to grow by an equal or greater amount.

Nonpurposeful (Incidental) Take: Nonpurposeful take of eagles occurs where the take is incidental to an otherwise lawful activity

Notice of Availability: A Notice of Availability (NOA) is a formal notice, published in the Federal Register that announces the issuance and public availability of a draft or final EIS.

Notice of Intent: A Notice of Intent (NOI) is a formal announcement of intent to prepare an EIS as defined in CEQ NEPA regulations (40 CFR 1508.22).

Nukil or hemnukuwin: An annual tribal mourning gathering that lasts six days to remember the dead. To this day, this ceremony is the most important and sacred ceremony to the Cahuilla.

Offsetting Mitigation: Compensatory measures that are required to essentially “replace” the number of eagles taken under a permit to achieve “no-net-loss.”

Ood: Eagle trapping sites, or places where eagles were captured for ceremonial use. These would be considered a “Gathering Place” or a type of Navajo TCP.

Phenology: The study of periodic plant and animal life cycle events and how these are influenced by seasonal and annual variations in climate, as well as habitat factors.

Power Purchase Agreement: A contract between two parties where one generates electricity (the seller) and one purchases the electricity (the buyer).

Predictive Distribution: The distribution of unobserved observations (prediction) conditional on the observed data.

Production Tax Credit: Federal incentive that provides financial support for the development of renewable energy facilities; the primary federal incentive for wind energy.

Programmatic Environmental Impact Statement: A programmatic environmental document, such as this PEIS, is prepared when an agency is proposing to carry out a broad action, program, or policy.

Programmatic Permits: Authorize recurring take that is unavoidable even after implementation of Advanced Conservation Practices.

Programmatic Take: Programmatic take is defined as take that is recurring, is not caused solely by indirect effects, and that occurs over the long-term or in a location or locations that cannot be specifically identified.

Promulgate: Put a law or decree into effect by official proclamation.

Public Scoping: As part of the preparation of an EIS, NEPA requires that there be an early and open process for determining the scope of the issues to be addressed by a study. This process is commonly known as public scoping.

Record of Decision: A concise public document that records a federal agency's decision concerning a proposed action for which the agency has prepared an EIS.

Section 7 Consultation: Section 7 (a)(1) of the ESA charges federal agencies to aid in the conservation of listed species, and Section 7 (a)(2) requires the agencies, through consultation with the Service, to ensure that their activities are not likely to jeopardize the continued existence of listed species or adversely modify designated critical habitats.

Standard Permits: Authorize individual instances of take that cannot practicably be avoided.

Sun Dance: A ceremony practiced by mostly Plain Indians to offer personal sacrifice as a prayer for the benefit of one's family and community.

Take: Take of an eagle includes the following broad range of actions: pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb.

Tax Credit: A dollar-for-dollar reduction in the income taxes that the entity claiming the credit would otherwise have to pay the federal government.

Tiering: Refers to the coverage of general matters in broader EIS documents with subsequent narrower statements or environmental analyses (ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared.

Tribal Cultural Property: A historic property of religious and cultural importance under the NHPA. For the purpose of this PEIS, a landform or landscape known for eagle habitation – a ridgeline, canyon, lakeshore, river valley, mesa, mountain, etc. – may be considered by tribes as suitable for designation as a property of religious or cultural importance.

Warbonnet: Headdresses worn by Plain Indians men who have earned a place of great respect in their tribe. In the past they were sometimes worn into battle, but today they are worn primarily for ceremonial occasions.

Wokile Dance: God-impersonating dance of the Central Sierra Miwok.

APPENDIX A: STATE STATUS AND NATURESERVE CONSERVATION STATUS RANK FOR BALD EAGLES AND GOLDEN EAGLES

State	Bald Eagle		Golden Eagle	
	State Status[1]	NatureServe Status[2]	State Status[1]	NatureServe Status[2]
Alabama	T	S4B	No Special Status	SNRN
Alaska	No Special Status	S5	No Special Status	S4B, S3N
Arizona	SSC	S2S3B, S4N	No Special Status	S4
Arkansas	No Special Status	S2B, S4N	No Special Status	S3N
California	E	S2	No Special Status	S3
Colorado	SSC	S1B, S3N	No Special Status	S3S4B, S4N
Connecticut	T	S1B, S3N	No Special Status	SNA
Delaware	No Special Status	S2B, S3N	No Special Status	SNA
Florida	No Special Status	S3	No Special Status	SNA
Georgia	T	S2	No Special Status	S1
Idaho	T	S3B, S4N	No Special Status	S4B, S4N
Illinois	No Special Status	S2B, S3N	No Special Status	SNA
Indiana	SSC	S2	No Special Status	S1N
Iowa	SSC	S3B, S3N	No Special Status	SNA
Kansas	No Special Status	S2B, S4N	SINC	S1B, S2N
Kentucky	T	S2B, S2S3N	No Special Status	SXB, S2N
Louisiana	E	S3	No Special Status	S1N
Maine	No Special Status	S4B, S4N	E	S1B, S1N
Maryland	No Special Status	S3B	No Special Status	S1N
Massachusetts	T	S2B, S3N	No Special Status	S1N
Michigan	No Special Status	S4	No Special Status	SNRN
Minnesota	No Special Status	S3B, S3N	No Special Status	SNRN, SNRM
Mississippi	No Special Status	S2B, S2N	No Special Status	S1N
Missouri	No Special Status	S3	No Special Status	SNRN

State	Bald Eagle		Golden Eagle	
	State Status[1]	NatureServe Status[2]	State Status[1]	NatureServe Status[2]
Montana	SSS	S3	SSC	S3
Nebraska	No Special Status	S3	No Special Status	S3
Nevada	At-risk	S1B, S3N	Watch List	S4
New Hampshire	T	S2	E	SHB
New Jersey	E	S1B, S1N	No Special Status	S4N
New Mexico	T	S1B, S4N	SGCN	S3B, S4N
New York	T	S2S3B, S2N	E (extirpated)	SHB, S1N
North Carolina	T	S3B, S3N	No Special Status	SXB
North Dakota	No Special Status	S1	No Special Status	S3
Ohio	No Special Status	S2	No Special Status	SNA
Oklahoma	No Special Status	S1S3	No Special Status	S2
Oregon	No Special Status	S4B, S4N	No Special Status	S3S4
Pennsylvania	Recovered	S2B	No Special Status	SNA
Rhode Island	No Special Status	S1B, S1N	No Special Status	S1B, S1N
South Carolina	T	S2	No Special Status	S2
South Dakota	T	S1B, S2N	No Special Status	S3S4B, S3N
Tennessee	DNM	S3	T	S1
Texas	T	S3B, S3N	No Special Status	S3B
Utah	SSC	S2B, S4N	No Special Status	S4
Vermont	E	S1B, S4N	No Special Status	SNA
Virginia	No Special Status	S3S4B, S3S4N	No Special Status	SHB, S1N
Washington	State Sensitive	S4B, S4N	State Candidate	S3
West Virginia	No Special Status	S2B, S3N	No Special Status	S3N
Wisconsin	No Special Status	S4B, S4N	No Special Status	S2N
Wyoming	SGCN	S3B, S5N	Potential Concern	S4B, S4N

[1]*E = Endangered; T = Threatened; SSC = Species of Special Concern; SSS = Special Status Species; DNM = Deemed in Need of Management; SGCN = Species of Greatest Conservation Need; SINC = Species in Need of Conservation*

[2]*National (N) and Subnational (S) Conservation Status Ranks:*

Status	Definition
NX **SX**	**Presumed Extirpated**—Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
NH **SH**	**Possibly Extirpated** (Historical)—Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
N1 **S1**	**Critically Imperiled**—Critically imperiled in the nation or state/province because of extreme rarity (often five or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
N2 **S2**	**Imperiled**—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
N3 **S3**	**Vulnerable**—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
N4 **S4**	**Apparently Secure**—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
N5 **S5**	**Secure**—Common, widespread, and abundant in the nation or state/province.
NNR **SNR**	**Unranked**—Nation or state/province conservation status not yet assessed.
NU **SU**	**Unrankable**—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
NNA **SNA**	**Not Applicable** —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
N#N# **S#S#**	**Range Rank** —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
Not Provided	Species is known to occur in this nation or state/province. Contact the relevant natural heritage program for assigned conservation status.

Breeding Status Qualifiers

Qualifier	Definition
B	**Breeding**—Conservation status refers to the breeding population of the species in the nation or state/province.
N	**Nonbreeding**—Conservation status refers to the non-breeding population of the species in the nation or state/province.
M	**Migrant**—Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the nation or state/province.

Bald and Golden Eagle Management:

Public Comment Process and Analysis for Scoping Meetings

Final Report to the U.S. Fish and Wildlife Service

February 5, 2015

Bald and Golden Eagle Management

Public Comment
Process and Analysis for Scoping Meetings

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Table of Contents

Appendices

Executive Summary

The U.S. Fish and Wildlife Service (USFWS or Service) is refining its management objectives for Bald Eagles and Golden Eagles and considering revisions to eagle non-purposeful (incidental) take permit regulations (50 CFR 22.26) and eagle nest take regulations (50 CFR 22.27). These permits allow the take of eagles where the take is associated with, but not the purpose of, otherwise lawful activities. In April 2012, the Service published an Advanced Notice of Proposed Rulemaking to solicit preliminary public input on possible revisions to the permit regulations.

The Service contracted with D. J. Case and Associates (DJ Case) in March 2014 (as a sub-contractor to Kearns-West) to assist in planning and implementing public input for a scoping process to identify issues to consider when revising the eagle non-purposeful take permit regulations. DJ Case is a natural resource communications firm based in Mishawaka, Indiana.

Based on DJ Case's experience with public input techniques for similar high-profile species, DJ Case recommended an open house format for the eagle scoping meetings. In addition, a "virtual meeting" website was also recommended.

A notice of the public input process was published in the Federal Register (June 23, 2014 *79 FR 35564*). Five public scoping meetings were held between July 22, 2014, and August 7, 2014. These meetings consisted of a narrated overview video presentation and ten large informational displays with supplemental informational handouts. Representatives from the Service were available to answer participants' questions and listen to their ideas and concerns. Approximately 213 people attended the meetings, and all were encouraged to submit written comments.

DJ Case developed a website, http://www.eaglescoping.org, to serve as a "virtual meeting," where visitors could go to see the same information that was presented at the public meetings, including the overview video presentation and informational displays. Links to the Service e-mail for public comments were included on the site.

The Service received a total of 536 comments during the public comment period. Upon removal of duplicates, there were a total of 517 unique comments, of which many included additional attachments (e.g., scanned letters, one picture, and supporting documents). In addition to the comments received, two organizations provided spreadsheets with additional comments. First, the Friends of Blackwater provided a spreadsheet of 46 supporters of their comment. Secondly, the National Audubon Society provided a spreadsheet of 25,349 comments in support of their comment and 2,064 personalized comments.

The comments received required analysis to facilitate compilation, interpretation, and understanding. Thematic analysis and key-word analysis were used to categorize the eagle comments. DJ Case reviewed comments submitted at the public meetings, online, through mail and faxes for common themes.

Introduction

The U.S. Fish and Wildlife Service (Service) is refining its management objectives for bald eagles and golden eagles and considering revisions to eagle non-purposeful (incidental) take permit regulations (50 CFR 22.26) and eagle nest take regulations (50 CFR 22.27). These permits allow the take of eagles where the take is associated with, but not the purpose of, otherwise lawful activities. In April 2012, the Service published an Advanced Notice of Proposed Rulemaking to solicit preliminary public input on possible revisions to the permit regulations.

The Service is analyzing various aspects of bald and golden eagle management as part of its responsibility under the National Environmental Policy Act (NEPA). Public input is an important part of this process. The NEPA analysis will evaluate the environmental effects of a range of alternatives for eagle management, including possible changes to permit regulations.

The purpose of the public scoping process with regard to NEPA is to determine relevant issues that could influence the scope of the analysis, including alternatives, and guide the process for developing an environmental assessment (EA) or environmental impact statement (EIS) and related compliance efforts. This document reports the results of the initial scoping process—five public meetings that were held from July 22 to August 7, 2014.

Methods

D.J. Case & Associates (DJ Case), a conservation communications firm, was contracted by the Service (as a sub-contractor to Kearns-West) to coordinate and facilitate public input for the initial scoping process. DJ Case researched public involvement processes used in recent years for high-profile species to identify successful approaches. Based on that research, DJ Case developed recommendations that included an open house public meeting format, development of a public website, and mail-in comment cards. The open house format was suggested for the scoping process for several reasons:

- Open houses facilitate and encourage two-way communication.
- Participants have the opportunity to gain a better understanding of the issues through dialogue with the agencies involved in eagle management.
- Every attendee has the opportunity to ask questions and provide written comments.
- Participants can attend anytime during the open house period at their convenience.

- Participants uncomfortable speaking in a large group or holding viewpoints they perceive to be different than the majority are more likely to engage in one-on-one discussion than speak in front of a large group in a public hearing-type setting.

The Service elected to adopt the open house meeting format and website approach, and directed DJ Case to implement the processes.

Meeting Facilities
DJ Case arranged facilities for five public meetings held in California, Minnesota, New Mexico, Colorado and Washington D.C. between July 22 and August 7, 2014. Criteria for the selected facilities included Americans with Disabilities Act (ADA) accessibility, as well as accommodations for up to 200 participants at each location.

Date	**Time**	**Location**
July 22, 2014	5 p.m. to 8 p.m.	Red Lion Hotel Woodlake Conference Center, 500 Leisure Lane, Sacramento, CA, 95815
July 24, 2014	5 p.m. to 8 p.m.	DoubleTree Bloomington-MSP South, 7800 Normandale Blvd., Bloomington, MN 55439
July 29, 2014	5 p.m. to 8 p.m.	DoubleTree Albuquerque, 201 Marquette Avenue Northwest, Albuquerque, NM 87102
July 31, 2014	5 p.m. to 8 p.m.	Holiday Inn Denver Airport, 6900 Tower Rd, Denver, CO 80249
August 7, 2014	1 p.m. to 5 p.m.	South Interior Building, 1951 Constitution Ave, NW Washington, DC 20240

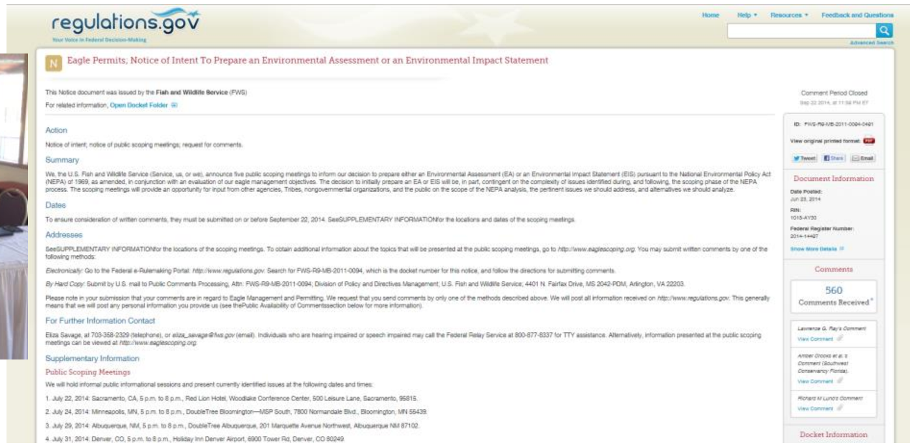
Publicity
The Service prepared an official notice of five public scoping meetings, which was published in the Federal Register on June 23, 2014 (79 FR 35564). The Service published a news release on June 20, 2014, announcing the process to review eagle management objectives and non-purposeful take permits. The Federal Register notice can be found in *Appendix A* and the News Release can be found in *Appendix B*.

Meeting Process
The open house meeting format included the following elements:

- A 6.5-minute, continuous-loop, video presentation providing an overview of eagles and the scoping process
- A series of 10 informational posters and handouts focused on:
  - Golden eagles
  - Bald eagles
  - Management objectives
  - Adaptive management process
  - Compensatory mitigation

- Programmatic permits
- Cultural resources and values of eagles
- Permits for taking eagle nests
- National Environmental Policy Act (NEPA)
- Importance of eagle research

In addition, comment cards and computers were available onsite, which participants could use to submit written comments for the public record at Regulations.gov (http://www.regulations.gov/#!documentDetail;D=FWS-R9-MB-2011-0094-0491).

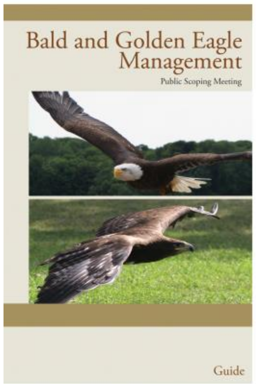


In order to ensure consistency across all meetings, facilitators from DJ Case provided training to agency representatives prior to the meetings. At each meeting, Service staff greeted participants. The facilitators explained the meeting format, invited participants to sign up for further communications from the Service, and gave each participant a comment card, encouraging them to provide written comments during the comment period ending September 22, 2014.

Facilitators encouraged participants to first view the six and a half-minute, narrated video presentation. Typically, the narrated video presentation was set up in the corner of the room nearest the entrance, and seating was provided for those who wanted to sit and watch. The presentation was set to a continuous loop and ran throughout the meeting. The presentation highlighted salient issues in regards to the proposed revisions to the eagle non-purposeful (incidental) take regulations. A link to the presentation is included in *Appendix C*.

Ten informational panels with supplemental handouts relating to eagles and the proposed revision were displayed around the room at each meeting. These included biological and life history information about bald and golden eagles, as well as information about eagle management and the public input process. Most participants viewed the exhibits and many commented on the amount of information they learned. Copies of the informational displays and handouts are located in *Appendices D-M*.

The open house format provided the opportunity for participants to speak one-on-one with representatives from the Service, who were available to answer questions and discuss issues and concerns. Participants and agency representatives were able to engage in dialogue; participants could ask questions of the representatives, as well as express their ideas and concerns. This kind of interaction is invaluable in helping the Service identify the range of issues and concerns regarding eagles—the purpose of the scoping process.



In addition, a booklet/workbook was developed and provided, containing printed images of each banner alongside empty space for participants to use in jotting down questions and/or taking notes as they moved from one informational station to the next, and discussing each topic of interest with Service staff.

In order to ensure participants' comments were captured in the public record, Service staff encouraged participants to submit written comments after they were finished discussing the issues. DJ Case developed a comment card (*Appendix N*) for this purpose. Participants were advised that the interaction with Service staff would not be recorded, and only written comments would become part of the public record. Written comments were collected at the meetings, and participants were told they could also submit comments online via regulations.gov, via mail, fax, or e-mail prior to the close of the comment period on September 22, 2014. Mailing address, fax number and e-mail address were posted at each meeting.

Website

DJ Case developed a website, http://www.eaglescoping.org, as a "virtual public meeting."

It contained the same information presented at the meetings, so those not able to attend meetings in person would be able to gain information about the issue and submit written comments. Separate web pages were developed containing all of the content and imagery for each informational panel. The overview video presentation was posted to the site, as were the handouts. The website provided a link to the Service comment page at regulations.gov, making it convenient for viewers to easily submit written comments.

Analysis
DJ Case compiled all the comments submitted by the public, read every comment, and used thematic analysis and key word analysis to place them into meaningful categories. All of the specific recommendations that were identified in the comments were pulled out and are listed below.

Moreover, the purpose of the comments was not to take a poll or a vote, but rather to identify the range of issues for the Service to consider during the rulemaking process. All ideas and opinions were viewed with equal importance, whether stated by a few people or a few hundred.

Results

The Service received a total of 536 comments. Upon removal of duplicates, there were 517 unique comments, of which many included additional attachments. These attachments included scanned letters, spreadsheets, one picture, other supporting documents and two off-topic letters.

Comment Themes
Most of the comments could be categorized into eight major thematic areas (presented in no particular order):

- General comments against the killing of eagles (or for eagle protection)
- Proposed 30-year permit is too long (or keep the permit length at 5 years)
- Other permit length comments
- Falconry concerns or changes to eagle take for falconry
- Comments generally anti-wind energy facilities
- Comments generally pro-wind energy facilities
- A need exists for more research (or there is not enough information)
- Form letters originating from an organization, but sent by individuals.

These themes are briefly described below along with a quote or two that captures the essence of the category.

Killing or protection of eagles

Comments voiced concern over the killing of eagles or for the protection of eagles. Wrote one commenter, “Do not allow wind energy companies to kill any eagles without penalties. Eagles are precious wildlife.” Another exclaimed, “Protect these animals at all costs!”

Thirty-year permit too long (or keep the permit length at 5 years)

One theme found throughout many of the comments was concern that 30 years is too long for the permit or to keep the maximum permit term at 5 years. Explained one commenter:

> “In line with what many have commented already, I believe that extending the programmatic take tenure for bald and golden eagles from 5 years to 30 years is a mistake. 30 years was enough time for another North American raptor, the peregrine falcon, to pass from the brink of extinction to being removed from the Endangered Species List. Unfortunately, the same process could happen in reverse, and without careful monitoring of eagle populations, how are we to know that eagle take permits issued today will not be too much for the eagle population of 30 years from now?”

Other permit tenure comments

Commenters expressed the concern that the 30-year permit duration deters technological improvements, reduces diligence in proper siting and/or does not deter take.

> “While it is necessary to give consideration to wind farms and other commercial enterprises, the primary consideration should be the development of better strategies for preventing bird deaths rather than giving permission for large numbers of eagles to be killed. Issuing long-term permits with liberal exemptions allowing the taking of eagles does not encourage the development or implementation of preventive strategies by businesses once they are granted a permit.”

Falconry concerns

Many falconers submitted comments, but many of the comments were only indirectly related to the issues for which the Service was seeking input. In general, falconers who commented seek to loosen the limitations on the take of golden eagles for falconry. Falconers would like to be integrated as stakeholders in the eagle management process. They largely seek to reinstate the program, authorizing eagle trapping in depredation areas for falconry and use it as a tool to acquire eagles. In addition, they propose to improve the program by including dangerous wind farm areas as approved locations for take by falconers, and they would like to increase the authorized number of eagles taken from six per year to the total required or funded by wind energy companies. Falconers also suggested that they could breed and release golden eagles as a compensatory mitigation strategy for take permitted under eagle non-purposeful take permits.

Anti-wind energy facilities

Some comments received were generally opposed to wind farms or wind turbines because of the potential negative impact on eagles. For example, wrote one commenter:

> "We are not generating much power using the wind right now, what is it? 0.2%???? We can afford to put that much energy on hold until all the problems with wind are solved. Windmills are catching fire and setting fire to the woods that surround them! They are too loud. People who live near the mills are abandoning their homes just to get away from the noise. Mountaintops are being removed for reasons no one understands. And tens of thousands of birds are being killed! This is not a green industry! This is a blood-red industry. We must have a pause in wind installations until the problems with the generators are solved."

Pro-wind energy facilities

Not all comments were anti-wind energy. Wrote one commenter:

> "The biggest threat to eagles and to other species is declining water supplies and strange weather patterns caused by increasing levels of coal pollution in our atmosphere. Saving eagles means switching to cleaner electricity sources like wind farms and solar projects. I know that wind power can be built with extremely low risk to eagles, and I think you need to accept the low risk to eagles in exchange for a high degree of certainty that more eagles will be saved by eliminating pollution sources that are poisoning the air now."

Need for more research

As with concerns over the duration of the permit, some commenters expressed concern over the need for more research or information. However, a handful of comments focused specifically on the need for more research. Noted one commenter:

> "The permits for taking eagles should not be increased. More study is needed, paid for by private industry, on how to adjust their tactics to impact less lethally on the species. Tuna fishermen were forced to come up with nets designed for the release of lung breathing animals like the dolphin and sea turtles. It was a success. The same standards must be used by the wind industry. With a little effort, this problem can be solved to the benefit of all beings...including our American eagle population."

Letter Comment Themes
Some comments received were form letters in support of the comment letters from other organizations. These included one form letter mirroring the letter from Audubon International, 11 from the Rocky Mountain Sierra Club and 10 from the American Bird Conservancy. Recommendations from these letters have been included in the *Specific Recommendations* section below.

In addition to their direct comments, two organizations provided spreadsheets containing additional comments. First, the Friends of Blackwater National Wildlife Refuge provided a spreadsheet of 46 supporters of their comment. In their letter, they argue for the fullest protection of eagles allowed under the extent of the law and that wind farms should not be sited where they can harm raptors.

Secondly, the National Audubon Society provided a spreadsheet of 25,349 comments in support of their letter and 2,064 personalized comments. These comments raise concerns over experimental, unproven mitigation measures. They urge the Service to complete comprehensive conservation planning for both eagle species, set clear conservation goals for each management region, and commit resources to rapidly developing protective Advanced Conservation Practices (ACP). Further, they suggest that the Service should retain the current standard that requires measures to reduce eagle take to the point where remaining take is unavoidable, rather than relaxing this standard. Impact avoidance should be the first course of action for development projects that could harm America's eagles.

Specific Recommendations

In addition to being part of the general themes listed above, many of the comments contained specific recommendations for the Service to consider regarding eagles and eagle management. This section will likely be most useful for Service consideration. All specific recommendations are presented below, again in general thematic categories and presented in no particular order.

NEPA Process
- The NEPA process was violated during this process and a full EIS should be conducted.
- The EIS should include an alternative that returns to five years as the maximum permit duration, and also the effects of not renewing a take permit after its five year duration.
- The Service should conduct a national programmatic wind EIS and use it to identify areas where wind energy cannot be developed due to unacceptable risk to public trust resources, including eagles and other federally protected birds and bats.
- The Service should conduct a nationwide programmatic NEPA analysis on the issuance of eagle conservation permits for electric utilities so subsequent

permit applications can be categorically excluded from additional NEPA analysis. Under the current permitting process, each application is subject to independent NEPA analysis. Most utilities cannot afford this cost, nor justify it to public service commissions or electric co-operative members. In addition, these costs would likely take funds away from a company's APP, and divert funds that could have otherwise been used to retrofit poles. Individual project NEPA analysis is the biggest constraint associated with the current eagle take permit process. A programmatic analysis under NEPA would streamline and expedite the process for applicants and likely result in more participation by electric utilities and others. Also, the money saved by companies not having to pay for NEPA analyses on individual projects could be used for actions that benefit eagles directly.

- The case for conducting a programmatic NEPA analysis is especially applicable for projects categorized as low risk. Should a NEPA review be required for higher risk projects, an Environmental Assessment should be utilized rather than a materially more burdensome and costly Environmental Impact Statement.
- The benefits of various activities that impact eagles should be analyzed in the EA or EIS. For example, renewable energy will benefit eagles and other wildlife by reducing carbon emissions, and utilities manage large water reservoirs that provide valuable foraging habitat for bald eagles.
- The Service should integrate tribal consultation throughout the NEPA process for this rulemaking and for individual permit applications to take eagles by providing tribes with clear proposed rulemaking and permit application information in a timely manner, disseminating information to a wide tribal audience, and ensuring that in-person consultation meetings are conducted.
- All environmental reviews for take permits should be published for public review and comment.
- The NEPA analysis must consider the unique effects that eagle handling and eagle takes have on tribes. For example, topics for consideration should include: how a loss of eagles in an area where tribes are present will affect such tribes; the extent to which tribes can participate in handling the remains of eagles that are taken on reservation lands; protection of tribal cultural resources and historic properties by a project seeking a permit to take eagles; and whether procedures for handling eagle remains are consistent with tribal practices and beliefs.
- The Final EA, Final Rule, and Guidance do not specify the mechanism by which the NEPA document should be prepared. Thus, an applicant-prepared EA is permissible under the current regulations, and EDPR encourages the Service to accept applicant-prepared EAs to expedite the permitting process.
- The Service should clarify that projects seeking take permits will be subject to NEPA analysis only in regard to the effects of the permit itself, and not the authorization of the project itself.

- For the NEPA on individual permits, the Service should use the project-specific NEPA already undertaken by other federal agencies, rather than developing an additional NEPA document.
- Independent, third parties not employed directly by the permittee should conduct the environmental assessment (EA). This could be accomplished by the permittee supplying funds for the EA managed by the Service.

Population Goals and Management Objectives

- Populations should be managed using western and eastern take thresholds rather than Bird Conservation Region (BCR)-based regional thresholds. Satellite telemetry data (published and currently being collected) suggest a great deal of mixing across BCR boundaries.
- Management of golden eagles by BCRs is problematic because most BCRs are large and span multiple jurisdictional boundaries; individual eagles may use multiple BCRs throughout the year; and a single BCR may host breeding, resident, and migratory eagles in different locations and/or times of year. Management should be at three scales: flyway, state, and local.
- The Service should establish smaller local geographic units (as defined by eagle biology and movement) in order to better assess project-level impacts and mitigation.
- The Service should consider using the states as the Eagle Management Units (EMUs) for bald eagles.
- The Service should treat Alaska as one EMU for both bald and golden eagles. A lack of information regarding golden eagle populations in Alaska does not justify the imposition of a rigid "no net loss" standard. When combined with the emphasis on management by EMUs, the Service has established a disproportionately high threshold for the approval of golden eagle take permits. Accordingly, in Alaska, the Service should discontinue the "no net loss" standard and the application of multiple EMUs for golden eagles, and should instead provide for a flexible approach to acceptable compensatory mitigation.
- The Service should revise its interpretation of the eagle preservation standard to apply to the national population of eagles, and should therefore issue an eagle take permit if issuance would not reduce the likelihood of survival of the species of golden eagles and bald eagles nationally, rather than individual eagles, local, or sub-regional populations.
- The Service should develop regional strategies to evaluate whether the predicted magnitude of cumulative impacts on eagles is consistent with the preservation of eagles. This will require that there is sufficient baseline data from each region to monitor any changes that occur over time. Evaluate take not just in a regional context, but also taking into account its impact on local and national populations.

- Remove the reference to "breeding" populations in the preservation standard and replace it with "consistent with the goal of stable or increasing populations." This change will better recognize recent findings clarifying the importance of sub-adults and floaters to eagle populations.
- The Preservation Standard should incorporate the concept of resilience, requiring maintenance of "*resilient and* stable or increasing" breeding populations." For eagle populations to be resilient to change, multiple factors (size, genetic diversity, demographics) must be of sufficient quality to provide for long-term persistence.
- For golden eagle management units with adequate population data and robust populations, the Service should relax the "no net loss" standard and implement the permitting process at levels compatible with maintaining stable or increasing populations.
- Adopt a conservative, low-risk approach for both species in light of uncertainty and prioritize achieving management objectives to ensure the preservation of the species.
- The Service should adopt a low-risk tolerance (cautious approach) to management of golden eagles in the Southwest (BCR16) because of changes in climate, land management and resource development, and continued human population growth.
- The Service should replace the current "preservation" standard with "to not meaningfully impair the Bald/Golden Eagle's continued existence."
- The Service should adopt a Qualitative Prevention approach rather than a Quantitative Allowance approach to allow for more flexibility to permit even if mitigation options are not available to fully compensate for impacts, thus increasing data collection as the result of monitoring required by the permit.
- We believe the quantifiable approach is far too cumbersome and makes for an overly complex management/permitting approach. Aside from reducing the complexity of analysis for and issuing permits, proceeding with a qualitative assessment approach would allow for greater flexibility in compensatory mitigation options than the quantitative approach – focusing more on "growing" eagles than saving them from other anthropogenic sources of mortality.
- The preservation standard currently implemented requires surveys and monitoring with the likely consequence that funds will be redirected from more important resource needs.
- There should be national management objectives for eagle populations that are stable and/or increasing. Quantitative objectives allow states to measure progress towards goals, are an essential feature of adaptive management strategies, and are the best way to ensure that eagle populations remain secure.
- Numerical population objectives alone are not sufficient to guide permitting decisions without appropriate take thresholds and/or caps for regional and local populations. Like population objectives, take thresholds and caps

should be evaluated periodically and risk should be refined based on monitoring data and the results of research efforts.

- The alternative qualitative approach described in the scoping materials "to not meaningfully impair the bald or golden eagles' continued existence" is vague, ambiguous and subject to interpretation. The suggestion that extinction is a threshold is alarming and contradicts the regulatory standard of the Eagle Act. While qualitative objectives may provide a larger degree of flexibility, they often rely far too heavily on the judgment of individuals, often working in isolation and overwhelmed with permit reviews. It is impossible to determine whether an individual project is consistent with the preservation standard absent an understanding of the full set of cumulative impacts likely to affect both the local and regional populations (e.g., wind facilities, residential development, drought, lead ammunition, climate change, etc.) examined against the backdrop of meaningful population goals and objectives.
- The Service should use both a quantitative and qualitative approach. The qualitative criteria could be used when there is not enough data in an area to set population objectives and take thresholds.
- The Service should use smaller local geographic management units within the larger regional units, which would allow the Service to permit take in areas where the local breeding population exceeds the regional averages. It would also mean that replacement mitigation would not need to be tied to the larger regional population, but would be based on the local population.
- The Service should reconsider the position that "historic" or "baseline" types of take should not count against the take thresholds. Failure to evaluate these types of take will lead to an over-estimation of the Maximum Sustained Yield as described in the Final Environmental Assessment (FEA) on the 2009 permit regulations.
- The Service should conduct an analysis to assess the relative contribution of 'historical' or 'baseline' types of take to the overall take that might be expected.
- The Service should develop a new Maximum Sustained Yield take threshold model based on the take of adult individuals from the population, rather than the removal of juveniles (as was the basis for the 2009 FEA) because the removal of juveniles has less of an impact than removal of mature individuals.
- The revised management scheme needs to clarify whether take caps are hard or flexible. The Service has issued permits that exceed the 5% local area population cap but has not articulated under what circumstances ignoring the cap is acceptable and how it is consistent with the preservation standard.
- In order to effectively balance the population with development pressure, habitat loss, and other unanticipated impacts to the eagle population, a management goal of increasing the population would be a more conservative approach to protecting the eagle population.

- Eagle population status should be assessed every five years using the best scientific methodologies available.
- The Service should re-evaluate new information (data) that may affect management decisions or take permits on an annual basis. Incorporation of new, peer-reviewed research needs to occur quickly because predator populations can experience sudden, drastic changes.
- Where regionally appropriate information is lacking, the Service should use caution in relying on data collected elsewhere.
- The Service should use the most current research and scientific information (for example, telemetry data) to re-draw and update the EMU boundaries to more accurately reflect breeding territories, wintering ranges, and migration corridors for bald and golden eagles.
- The Service should perform their 5-year review of bald eagle regional take thresholds and also update the thresholds for golden eagles.
- Incorporate updated baseline eagle population information, analyzing cumulative threats, updating population goals and objectives, and identifying an effective regional conservation plan that describes specific avoidance criteria, best management practices, and advanced compensatory mitigation strategies to address biological needs and key threats for regional populations.
- The current rulemaking should take this opportunity to address the differences between bald eagles and golden eagles in terms of their natural history, habitat requirements and behavior, and address how the management units, risk models and mitigation measures planned for each reflect the conservation requirements of that species.
- Effective population objectives must be:
    - Consistent with the Preservation Standard;
    - Applicable at a variety of spatial scales (e.g., local populations, EMUs, and potentially flyways);
    - Developed through a standardized approach that is based on the best available science and incorporates the appropriate level of uncertainty and risk;
    - Refined periodically based on monitoring and population status and trends;
    - Developed within a collaborative, peer-reviewed process; and
    - Representative of population parameters, such as sex or age ratios, genetic characteristics, etc.
- The Service should allow for take thresholds to be flexible in some cases to account for migrating, wintering, etc. eagles that come from other regions.
- The Service should exercise caution when permitting lethal take of eagles where best science shows populations are compromised, or especially where populations are proven to be 'sink' populations.
- The USFWS should reconsider the concept of "depredation" as applied to golden eagle take for the purpose of falconry. In the manner "depredation" and "mitigation" activities could be properly coordinated and balanced

across the range of the golden eagle. By redefining depredation to encompass other meanings and geographical areas and including the golden eagle itself as "wildlife," the concept of "depredation" by golden eagles becomes something that includes take of eagles to protect themselves. As wildlife, a situation where golden eagles are flying into windmill power generators, with lethal results, becomes golden eagle depredation involving wildlife. Therefore, incidental take of golden eagle by wind farms is "depredation" within the meaning of the Eagle Act, which allows golden eagle take for falconry purposes. Falconers permitted to trap golden eagles prior to entering a "wind farm" are undertaking the first mitigation priority – "avoiding" the potential of lethal take by the windmills. Golden eagles taken in this manner could be relocated to another safer area, with a small percentage of these "mitigated" eagles available for falconry purposes.

Pre-permit evaluation, surveys, and analysis

- Pre-construction surveys using rigorous methods standardized by the Service for wind energy development should be mandatory, not voluntary.
- Two years of independent, pre-construction monitoring of eagle behavior, nesting, foraging and migration should be required.
- Fatality prediction models should be different for the two species based on the apparently different behavior and risk profiles of each species. The golden-eagle based prior probabilities for exposure and collision are unlikely to be representative of bald eagles and will overestimate project risk.
- Exposure-based models used to predict mortality during pre-construction risk assessments should be tested for accuracy and new models should be developed that take cumulative impacts of all sources of mortality into account.
- The current Bayesian prior probabilities for exposure and collision probabilities are based on data on golden eagles at old wind facilities in the western U.S. In estimating bald eagle take, the Service should replace these priors with empirical data on bald eagles at modern wind energy facilities.
- The Eagle Conservation Plan Guidelines (ECPG) indicate that eagle nest surveys should be conducted in the project area, which it defines as the area within the project boundary plus a 10-mile radius surrounding the project. However, the 10-mile radius recommendation was based on golden eagles in the desert southwest and is of questionable value in other areas and unnecessary for bald eagles. The Service should develop appropriate national standardized criteria that are species-specific and based upon region-specific information.
- The ECPG recommends 20 hours per turbine per year of sampling effort, which is far higher than suggested by simulations using the Bayesian fatality model. The additional surveys do not provide a corresponding benefit in terms of estimating risk, but are imposing additional costs on developers. The sampling guidance should be revised to avoid over-sampling.

- The ECPG is intended to guide project proponents and Service personnel in evaluating risk to eagles and developing eagle conservation plans (ECPs) and permit applications. However, different Service Regions have developed modified guidance. The Service should ensure standardization of the guidance nationally.
- The ECPG and the 2009 permit regulations are inconsistent as to whether the maximum take thresholds are set at "1% of annual productivity" or "1% of population."
- As it is critical for assessing risk, the Service should require radar data at different times of the year and weather conditions to monitor activity and height of migratory birds flying through the area.
- There is a need for greater clarification on risk assessment and monitoring specifications/requirements for electric utilities and other industries, such as mining. The Service should develop eagle conservation plan guidance for these other industries.
- The Service or other third-party, professional biologists should conduct pre-construction surveys.
- Consultants for wind developers who conduct pre-construction surveys should not be involved in the drafting of Environmental Assessments or Environmental Impact Statements for those same projects, and should not be tasked with verifying or approving the validity of the information provided to the Service.
- All information generated for a proposed or operational wind energy project should be downloaded to a free, user-friendly Service docket to bring much needed transparency to the process.
- The Service should use the growing body of post-construction monitoring data to update their assessment of the potential for disturbance.
- Recommendations from wildlife agencies should be incorporated into the project planning.

Permit Duration/Tenure

- The recent revisions to the permit regulations that allow for permits to be issued for up to 30 years endanger eagles. There is not enough data or analysis to support permits of this duration.
- The extension of maximum permit tenure to 30 years is appropriate and will encourage project proponents to obtain eagle take permits and commit to the associated conservation measures that will benefit eagles.
- The programmatic take permits should be subjected to a three-year renewal and review cycle. Technology in the wind industry is changing at a speed that long-term permit requirements would not be able to capture.
- The maximum programmatic permit tenure should be 15 years with thorough and effective review every 5 years. These reviews should be independent of permittee-derived monitoring results.
- The maximum permit tenure should be 20 years with the option for review and permit renewal for an additional 10 years. However, this 20 year permit

must require that post-construction monitoring occur annually in years 1-5 and then every third year for the balance of the permit.

- For projects that will have a longer life-span or a more lengthy federal license or permit term, the Service should revise the regulations to retain the flexibility to grant programmatic take permits that extend beyond 30 years so that the permit term is coextensive with the life of the project, or at least consistent with the term of the federal authorization.
- The regulations need to retain the provision that the Service may suspend or revoke permits if necessary to protect eagles.
- Long-term permits for activities that pre-date the 2009 regulations should function in the same manner as long-term permits for new activities.

Permitting Decision Process and Issuance Criteria

- The Eagle Act does not require that the incidental take of eagles must first be avoided and then minimized and mitigated so that any remaining take is unavoidable, as the Service currently requires. The Service should reexamine its interpretation of the Eagle Act.
- The criteria for issuing programmatic permits under the Eagle Act, consistent with the requirement for an Endangered Species Act incidental take permit, should only require avoidance and minimization to the maximum extent that take cannot practicably be avoided, and then mitigate for residual take that cannot otherwise be avoided.
- An "unavoidable" standard could present a high threshold, where reliability, proven effectiveness, and cost are not considered in developing and implementing "advanced conservation practices." The cost of a conservation practice should have a reasonable relationship to the potential benefits derived from such a practice. Use the same standard for both an individual and programmatic take - that a take cannot be practicably avoided.
- The analysis of individual projects must be considered in the context of similar surrounding projects, and the Service should develop criteria to study the landscape effects of such projects.
- The approval of future projects should take into account the health of eagle populations including thresholds beyond which a population becomes threatened; the dynamics of eagle migration; and the iterative effects of continued development.
- To the extent that the Service amends the current issuance criteria for programmatic permits to align with the "practicable avoidance," the term "practicable" should be redefined as "capable of being done after taking into consideration, relative to the magnitude of the impacts to eagles: (1) the cost of the remedy for an actual measurable impact as compared to the overall benefit and utility of the project with respect to public interest; (2) existing technology; and (3) logistics in light of overall project purposes."
- The Service should also amend the definition of ACPs, to ensure consistency with the change to the definition of "practicable," if the latter is adopted.

- The unavoidable standard should not be eliminated. All permits should require permittees to avoid and minimize the take of eagles to the degree that remaining take cannot practicably be avoided.
- The practicable standard should be applicable to programmatic take permits and the "practicable" standard should not take into account the project proponent's resources.
- Although a proponent's ability to pay can be a relevant factor in determining the extent of conservation measures, the "cost of the remedy compared to [the] proponent resources" should not be an overriding factor. The determination should also consider the benefit to the species derived from the remedy. If the benefit to the species from an avoidance and minimization measure is low and the cost is high, the measure would not be considered "practicable."
- The regulations should require mandatory compliance with the ECPG and the Land-Based Wind Energy Guidelines to achieve the "unavoidable" criteria specified in the current regulations for the issuance of a programmatic take permit at all new wind energy facilities.
- All environmental reviews that affect take permits should go through nation-wide publication, advertising, and review process with sufficient time for comment period (e.g., 60 days).
- As a starting point, the proper affected tribes must be identified (by casting the widest net possible) and contacted to participate in permit decision-making.
- Early and meaningful consultation with tribes should occur to "use" traditional ecological knowledge.
- State wildlife agencies should be consulted in the federal eagle take permit process, including the Service internal, five-year, non-public "reviews" of programmatic permit conditions for the 30-year life of a permit.
- The authorized level of take for all programmatic permits should be at least two eagles to avoid requiring immediate re-evaluation of a permit upon the take of one eagle.
- Make the Service's national eagle management structure and practices, and the permit review process, transparent and open to full public review and comment procedures. Clearly articulate for each eagle take permit issued in a legally sound and scientifically defensible manner how it complies with BGEPA and ensures preservation of eagles, especially in the face of acknowledged uncertainty.
- Permit issuance should require preparation of EISs and Section 7 consultation under the ESA when ESA-listed species are known to be present.
- Areas of particular importance to eagles, such as migratory corridors and high-density nesting areas should not be allowed for wind development or should have additional scrutiny in the permitting process.
- Permits should only be given for actions where take may occur as a result of a random event. No permit should be issued for take that is predicted to occur.

Adaptive Management and Permit Conditions

- An independent third party entity and not the permittee should conduct monitoring, with a five-year oversight by the Service. Energy companies could pay the party through a trustee.
- The regulations should provide that all data on bird mortality at specific wind energy sites be made available for meaningful stakeholder (public) review and analysis on a regular basis, including analyses of the effectiveness of post-construction mitigation in reducing eagle (and other federally protected birds and bats) mortality.
- The Service should consider requiring that post-construction fatality monitoring follow a standardized protocol that has been proven effective and peer-reviewed.
- Adaptive management scenarios and the possibility of compensatory mitigation should be agreed upon in the planning stage of project development as part of the requirements for the programmatic permit.
- The revised rule should clarify what is required and what analysis is performed at 5-year reviews.
- The 5-year reviews should account for eagles that abandon nests, eagles that continue to breed, any nest that is removed, and all eagle mortalities associated with the project.
- Trigger mechanisms that will require additional measures by the permittee must be clearly identified prior to permit issuance and spelled out in the permit.
- Permit reviews should be informal discussions bound by mitigation options and costs defined by the permit.
- When changes to the permit terms and conditions are expected by the Service during the pendency of the permit due, the permittee should be provided as much advance notice as possible to plan and budget for potential changes in mitigation requirements. Periodic meetings (e.g., annually) between the permittee and the Service would be appropriate to ensure that both parties are informed on any potential issues or concerns.
- If the required post-construction monitoring determines take will exceed the pre-construction estimates, the project should be placed on a shorter re-evaluation cycle.
- Habitat changes can affect the patterns of eagles and must be accounted for.
- Increase frequency of turbine site inspection to search for physical evidence of mortality/injury event.
- Develop and employ video surveillance and other technologies (impact alarms).
- Provide onsite personnel quarters to facilitate monitoring of larger wind farms.
- Keep the public apprised of the status of experimental measures and adaptive management prescriptions.
- Implement a hierarchy of 1) avoidance; 2) minimization and 3) mitigation.

- Minimization strategies include seasonal curtailment during known periods of high avian use, as well as observation-based shutdown of turbines when eagles are within a specified distance of wind turbines.
- The Service should clarify that the NEPA analyses for the permit should cover the adaptive management provisions in the ECPG including the 5-year reviews.
- The 2013 revised regulations do not define what advanced conservation practices will consist of for long-term permits. Standards are needed for these advanced practices that evolve with changing science.
- In a migration pathway, the use of radar to detect migrating raptors and on-the-ground observers should be considered during migration periods. The cost of detection devices and methods to discourage eagles from using a site should be built into the project budget, as should the cost of temporary shutdown of the project, if necessary, during migrations.
- There is a need for peer-reviewed research-based risk models and standardized monitoring criteria, e.g., frequency (more often than every 30-90 days), monitoring duration, a search radius that corresponds to the turbine height and size of each turbine monitored and specific protocols for data collection.
- "For golden eagles east of 100 degrees West longitude, we will not issue any take permits unless necessary to alleviate an immediate safety emergency." The Service should reconsider this statement and allow for issuance of programmatic permits for "non-purposeful take" of golden eagles nationwide. The current regulations do not allow for recognition of the potential of non-purposeful take of golden eagles east of the 100 degrees West longitude.
- After construction, some projects may still result in take over time due to project operations. The level of take should be at least two eagles to avoid requiring immediate re-evaluation of a permit upon the take of one eagle.
- The Service should revise the definition of "programmatic take" to allow a programmatic take permit even if only indirect effects would cause a "take" or a "disturbance". The definition applies for "take that is recurring". Programmatic permits also should be used in situations where a "take may occur", but neither a take nor disturbance of an eagle is certain. This acknowledges both low risk activities and/or that avoidance and minimization methods may be sufficient to eliminate a future take.
- The Service should redefine ACPs as "scientifically supportable measures or testing of experimental measures that are approved by the Service to reduce eagle disturbance and ongoing mortalities to a level where remaining take cannot practicably be avoided."
- Immediately establish a process for Advanced Conservation Practices approval and implementation, including a transparent mechanism for selecting and assessing ACP effectiveness in minimizing eagle take and providing for a diversity of options.

- 5-year reviews create uncertainty for permittees. The Service should incorporate provisions similar to the Habitat Conservation Plan Assurance Rule for incidental take permits issued under the Endangered Species Act. This approach would provide regulatory assurances to permit holders and incorporate a greater degree of certainty in the 30-year programmatic permit process.
- The Service must retain the option to NOT renew a take permit at the 5-year review if the level of eagle kills exceeds the permitted threshold and may impact populations.

Compensatory Mitigation

- The regulations should make compensatory mitigation mandatory for all wind energy facilities and associated transmission towers and lines at which federally protected birds are being taken.
- Compensatory mitigation requirements should only be required as replacement mitigation for take that exceeds established take thresholds and populations are not healthy enough to sustain additional mortality, consistent with the Eagle Conservation Plan Guidance.
- Compensatory mitigation should address both direct and indirect effects, such as the loss of important use areas. The regulations should require compensatory mitigation for all permits associated with 1) anticipated or known fatalities; 2) anticipated or known loss of productivity; and anticipated or permanent loss of an important use area, including breeding areas, nest sites, foraging areas, and migration corridors.
- The Service should develop metrics to address compensatory mitigation for impacts to eagles outside the breeding population (i.e., on wintering grounds and during migration).
- The Service should provide regulatory assurance that, as long as permittees are abiding by the terms and conditions of their ITP, the Service cannot ask the permittee to neither commit any additional compensatory resources nor impose on the permittee any additional restrictions in the event of unforeseen circumstances short of a jeopardy determination.
- All lethal take of eagles should require compensatory mitigation. Without such a requirement, there will be no incentive for the wind power industry to refine their methods to reduce take.
- Mitigation should not be relied upon to offset mortalities.
- Mitigation should be managed by an entity that specializes in these strategies, rather than industry or the permittee.
- Allowing wind companies (and others) to retrofit other companies' power poles may result in power companies taking responsibility for fixing their own lines.
- The Service needs to collaborate with utilities on how to select which poles to retrofit and how to identify the highest priority areas for mitigation.

- The Service needs to recognize the cost differences in retrofitting different companies' distribution systems. The types of equipment, size, height and location of the power pole being retrofitted will affect cost to complete. Utilities must calculate specific cost or value according to pole type and the scope modification to determine a cost to retrofit.
- The ECPG states a cost of retrofitting per pole of $7,500 underestimates the cost of retrofitting the average pole. In addition, the Service has also underestimated the life of a pole at ten years. The age and cost to replace poles vary greatly. Costs to modify poles (particularly for transmission voltage) cost more than $7,500 per pole depending on the type of work done, voltage, location, climate, etc. The Service should work with electric utilities to ensure appropriate costs are considered and that pole modification programs are effective and durable.
- The Avian Power Line Interaction Committee (APLIC) has developed a guidance document titled, "Developing Power Pole Modification Agreements for Compensatory Eagle Mitigation for Wind Energy Projects" that provides a framework for developing, implementing, tracking, monitoring, and maintaining pole retrofits as compensatory mitigation. The Service should consider adopting this type of program or one similar to it.
- Retrofitting cannot be the only replacement mitigation option available. A utility should have the opportunity to review proposed retrofitting and/or refuse. The Service needs to have flexibility on type of mitigation required.
- The Service should provide sufficient flexibility in the Eagle Rule so that a utility will not be precluded from self-directing funds to retrofit poles and wires owned and operated by that utility where such retrofits would exceed normal Avian Protection Plan commitments and/or expedite the timeframe of a retrofitting plan.
- Falconers are in a unique position to participate in any compensatory mitigation or Species Survival Plan projects. This is because falconers are capable of conducting the entire range of activities and operations necessary for participating in a Species Survival Plan: Obtaining specimens from the wild, maintaining them in good condition, rehabilitation, training, conditioning for release, and release of golden eagles in to the wild to become successful members of an adult breeding population. A genetically diverse captive population of golden eagles must be obtained and maintained as a breeding population.
- Mitigation should focus upon the replacement of suitable eagle habitat. Conservation of nest sites and potential nest sites in vulnerable areas should be a high priority in light of the continued loss of habitat and nesting sites.
- The Service and permit holders should consider opportunities to achieve significant benefits to eagles through a comprehensive approach rather than relying on individual permit holders to conduct piecemeal mitigation projects. While these individual mitigation efforts can provide benefit to the species, a coordinated approach that combines compensatory mitigation requirements into a cohesive package should provide greater benefits to

eagles. Allowing permit holders to pay an in-lieu fee to support a mitigation fund, which could be used to support eagle conservation, research, and education efforts, would be one way to accomplish that objective.

- The Service's review should include how the Service will determine an appropriate amount of take, and explain why that determination may be different based upon differences among projects.
- Many projects have a long life span and a low possibility of "take". Here, the Service should provide a flexible method for implementing compensatory mitigation over time.
- If the benefit to the species from an avoidance and minimization measure is low and the cost is high, the measure would not be considered "practicable". Conversely, a project proponent should not be able to avoid compensatory mitigation if it proposes a project that fails to reasonably consider avoidance or minimization measures.
- Mitigation should be more tangible. The death of an eagle should result in mitigation directly saving the life of another eagle.
- Any revisions to the compensatory mitigation should require that conservation measures or monetary contributions be applied to the county where they are generated.
- By calculating the risk of eagle take through a formula that does not account for eagle avoidance behaviors (especially with the bald eagle), and then requiring compensatory mitigation to completely offset the level of assumed take (and, pursuant to the ECPG, requiring significant mitigation upfront), the Service sets the compensatory mitigation level too high and requires compensation for in effect “phantom” takes that may never occur.
- Options for mitigation should include:
    - An ammunition exchange in locations where eagles are impacted by lead;
    - Funding for identification and carcass removal programs that would remove carcasses from areas where eagles collide with vehicles or trains;
    - Habitat enhancement funding or purchasing mitigation lands through commercial habitat banks;
    - Funding for appropriate research efforts;
    - Reduction of unintentional poisoning;
    - Implementation of a reward system to reduce poaching;
    - Reduction of mortality from vehicle collisions and road kill-collisions through road kill-carcass removal efforts;
    - Shifting to use of non-toxic ammunition via hunter education and voluntary lead abatement;
    - Reduction of stock tank drowning;
    - Implementation of a whistleblower rewards system to reduce poaching;
    - A reduction of the impacts of secondary trapping;
    - Funding of Rehabilitation centers;
    - Chelation to reduce lead levels in eagles;
    - Funding of livestock depredation compensation programs to encourage landowners to protect eagles;

- Improved management of public recreational activities that reduce eagle productivity;
  - Prey management programs;
  - Habitat preservation;
  - Habitat restoration;
  - Reduction of unintentional poisoning;
  - Captive breeding programs;
  - Solar impacts;
  - Utility line marking to prevent collisions;
  - Nest discourager/excluder installation;
  - Contributions to eagle management programs.
- The Service should encourage and provide incentives for creative approaches to compensatory mitigation.
- Institute higher standards of avoidance and mandatory mitigation for: Eagle Management Units (EMUs) not able to sustain take, important eagle use areas, Important Bird Areas (IBAs) and other special protection areas, eagle migration corridors, and areas of high value habitat—particularly areas known for eagle use for foraging, nesting or concentrated migration activity.
- Carefully prioritize investment in mitigation options to provide for the greatest conservation benefit to the species, utilizing effective and measurable measures that provide tangible benefits to the affected species.
- Immediately identify and test for additional compensatory mitigation measures— including consideration of permanent conservation of important eagle use areas.
- Provide for durable mitigation, especially when considering habitat enhancement or conservation, and plans for effectiveness monitoring throughout the life of the permit.
- Consider habitat enhancement or conservation for mitigation. These could include: 1) fire prevention measures in areas with golden eagle breeding territories that are at high fire risk, 2) removal and control of non-native grasses which are known to increase fire risk and may also decrease golden eagle prey abundance, and 3) conservation easements to protect known golden eagle breeding territories that are at risk of residential, agricultural, or energy development.
- It is appropriate to not require compensatory mitigation for historic religious take by tribes; however, the Service should direct other permittees' mitigation efforts into the areas where the religious take occurs.
- The regulations should emphasize and incentivize avoidance in conservation plans and institute the full mitigation hierarchy prior to requiring compensatory mitigation.
- The desired conservation outcomes from compensatory mitigation should be achieved within a timeframe commensurate with predicted impacts to be offset. Given that the Service cannot predict when programmatic take will occur, benefits of proposed compensatory mitigation actions should accrue as early in the life of the project as possible.

- The length of time that the measurable benefits of compensatory mitigation persist should meet or exceed the length of time of the projected impacts.
- Compensatory mitigation actions should be proven to be reasonably likely to deliver expected conservation benefits.
- Actions proposed as compensatory mitigation should provide benefits beyond those that would be achieved if the mitigation actions had not taken place. The Service must also provide evidence that the mitigation does more than require permittees to complete actions that a third party is otherwise legally required to complete under federal, state, or local law.
- The Service should establish a standardized process for reporting and monitoring of compensatory mitigation actions to ensure compliance and the delivery of eagle conservation benefits.
- The Service should create separate risk models for bald and golden eagles based on their biology and behavior, as take estimates are the basis for determining the mitigation amounts.
- The applicant should, after each 5-year review period, be able to apply unused mitigation credits by carrying them over to subsequent review periods. Alternatively, these credits should be tradable or transferable.
- Allowing companies to receive credits for excess compensation could lead to excess take in some years, especially at the local scale. The Service needs to explain how the credit system will avoid excess take.
- The Service should allow mitigation opportunities that occur outside of the BCR where the take occurred and into adjacent BCRs (and possibly on a biome-wide basis), depending on the characteristics of the bird that was taken (e.g., migratory vs. resident) as long as those mitigation efforts help eagle populations in that BCR (i.e., the biology of the affected eagle population justifies a broader approach).
- Additional compensatory mitigation should only be required in response to changed circumstances previously provided for in the permit and applied at the project level consistent with the "no surprises assurances" provided by ESA incidental take permits. In providing this type of assurance, cost uncertainty would be reduced, thereby creating a situation where developers/owner operators would be more likely to seek full-term permits and to comply with the related conservation measures.
- The regulations should allow hypothesis-driven, scientifically based research to count as part of a mitigation strategy.
- The regulations should explicitly provide that mitigation will be focused on conservation of wild birds rather than hacking captive-reared eagles as a mitigation measure.

Permits for Taking Eagle Nests

- The definitions found in the current regulations make sense, but they conflict with how similar terms are used in scientific literature.
- The definition of inactive eagle nest should be revised to extend the time period when a nest is considered not currently being used beyond 10 consecutive days.
- The ten-day period used to define an "inactive" nest should be reduced to five days, particularly for nests where young have fledged. The shorter period is sufficient to identify eagle breeding activity.
- Permits should not be available to remove nests with no eggs or young, but which adults for purposes of breeding attend in order to prevent an anticipated (but not yet present) emergency situation.
- If the regulations will allow nests that are attended by adults but no eggs have been laid yet to be removed for anticipated safety emergencies, the regulations should include a clear decision process for what constitutes an anticipated emergency.
- Nest removal should occur outside of the breeding period and should only occur when there is an extreme safety situation.
- A nest should not be considered abandoned unless it has not been used for five years, as Golden Eagles sometimes return to a nest after two or three years.
- Expand take of nests to include new or potentially hazardous nests that are actively tended by adults but without eggs/chicks.
- The regulations should allow more flexibility for removal of active and inactive nests in urban areas and other areas of potential risk to successful nests.
- The high standard in the current regulations that limits nest removal to limited situations should be retained. It has contributed to the preservation of bald eagle nesting habitat and the persistence of historic nest territories in Florida.
- Expedite permit mechanism for removal of inactive nests with potential of risk, including those in urban areas.
- Under "50 CFR 22.27 (b) *Conditions*. (2) When an active nest must be removed under this permit, any take of nestlings or eggs must be conducted by a Service-approved, qualified, and permitted agent, and all nestlings and viable eggs must be immediately transported to foster/recipient nests or a rehabilitation facility permitted to care for eagles, as directed by the Service." This requirement may not always be feasible or possible. Rather, the language should be; "(2) When an active nest must be removed under this permit, any take of nestlings or eggs must be conducted by a Service-approved, qualified, and permitted agent. *In most instances, nestlings and viable eggs must be immediately transported to foster/recipient nests or a rehabilitation facility permitted to care for eagles, as directed by the Service. The Service will make the determination as to the fate of all nestlings and viable eggs*."

- The definition of “eagle nest” should have a temporal aspect such that a nest that remains unused for 5 consecutive years and has deteriorated to an unusable condition is no longer included. The definition should be expanded to allow for more flexibility when the need arises to remove a nest that has deteriorated and is in an unusable state. The proposed language is “Eagle nest means any readily identifiable structure built, maintained, or used by bald eagles or golden eagles for the purpose of reproduction. Through consultation with the Service, any nest that is deemed as unmaintained along with the absence of eagles, and the nest is in a state of deterioration will no longer be considered an eagle nest.”
- Permits for removal of bald eagle nests should be less stringent and easier to acquire, without requiring applicants to provide "net benefits" to eagles or mitigation.
- Additional circumstances that indicate a nesting pair may continue to be viable, such as identification of an alternate nest within the territory, should allow for removal of one nest without requiring “net benefit” measures.
- The regulations should maintain the current standards with respect to the “net benefit” requirement for removal of inactive nests, including further clarifications and a clear definition of what constitutes a “net benefit.”
- Due to the current population status of golden eagles, golden eagle nest removal criteria should be more restrictive in nature. Mitigation, whether compensatory or replacement, should be implemented, by the permit holder, for golden eagles. The destruction of golden eagle nests should be avoided, if at all possible, unless the nest is posing a safety emergency.
- In addition to situations that present human health hazards, the Service should retain the authority to issue nest removal permits in instances of extreme hardship, such as a new nest constructed following acquisition of a small housing lot.
- The regulations should be revised to allow nests to be removed to alleviate a threat of significant property damage.
- Permits should not be made available for removal or relocation of active nest with eggs or young for purposes other than safety emergencies.
- For cases where an inactive nest take permit is sought, a standard monitoring methodology should be required for determining the status of the nest so that such a determination can be reviewed and approved similarly by multiple permitting agencies.
- If a pair of eagles known to use one nest creates another resulting in the abandonment of the original nest, the old nest should be considered immediately abandoned.
- Permitting exclusions or streamlined permitting should be an option for inactive nest sites, which the applicant can demonstrate are degraded and for which removal will not have a detrimental impact on preservation of the species.

- The Service should evaluate the establishment of nest removal permits that would cover the removal of an active nest (without eggs or dependent young) or an inactive nest multiple times for the same location.
- Additional definitions should be added to the regulations, including the following:
  - Active Nest - this definition would serve to clarify the types of breeding behavior or evidence needed to prevent the take of a nest during a particular breeding season.
  - Active Territory - this definition would supplement the existing definition for area nesting population and relate to one breeding pair making a nesting attempt within an established breeding territory.
  - Inactive Territory or Historical Territory - this definition would aid in dealing with a scenario where nest structures are observed but no evidence of use has been documented for a specific period of time.
  - Alternate Nest - this definition would apply to a documented nest used by a breeding pair within the same territory in which a nest removal permit is applied for.
  - Nest condition - this definition would describe the qualitative evaluation of nest conditions used to determine the likelihood of repeat nesting at this site.
  - Non-viable Nesting Structure or Historical Nest Site - this definition would define a structure that has not been used for a period time or damaged from environmental conditions.
  - Existing Disturbance Regime - this definition is to provide a qualitative evaluation of the baseline conditions for which a new disturbance is proposed. For example, if an existing operation is ongoing and eagles chose to nest nearby, this needs to be considered when evaluating "take" or the risk for potential "take."
- The definition of “area nesting population” should be modified to remove the 10-mile radius because it may not have any bearing on the actual home-range of a nesting pair or on the project impact area.
- Establish and clearly define in the management objectives acceptable distances from eagle nests necessary to avoid disturbance of eagles in a given management area.
- Any nest, abandoned or active, that is removed for any reason needs to be accounted for in the five-year review.
- The term "abandoned nest" should be clarified so it is clear in the literature that both species may have several nests that they use on a rotational basis and will pick the current year's nest based on things like disturbance.
- The Service should seek input from electric utilities to define emergency situations that are specific to electric utility operations.
- The Service should clarify the type of permit needed for temporarily obstructing eagle access to nests (prior to nesting season) to prevent disturbance during nesting-season construction or maintenance activities.

Low Risk Category

- The Service should revise the definition of "low-risk" to include projects with slightly higher probability of taking eagles, provided the cumulative impacts would be compatible with eagle management objectives. The current definition represents such a low level of risk that the burdens of issuing take permits for both developers and the Service outweigh the benefits of the permitting. The Service should redefine the probability of take percentage for "low-risk" projects such that projects with the probability of take of 0.03 or lower should be able to address their potential impacts through the development of non-permit-based conservation strategies.
- The Service should exempt issuance of permits for projects with low-effects or "low-risk" by establishing a new categorical exclusion for them in its NEPA regulations. Given the Service's conservative take estimates and limited resources in its permitting program, a categorical exclusion for low-risk projects would be reasonable for the Service and project proponents.
- The Service should not broaden the category of "low-risk" projects established in the "Duration Rule" to include any projects that are likely to take more than 0.03 eagles per year.
- The Service should modify the low-risk threshold from 0.03 eagles per year to 0.17 eagles per year. Annual take probabilities of 0.17 eagles per year are the lowest that produce 30-year take probabilities rounding to 1.0 at two significant digits.
- The Service should use binomial probability to calculate the single-year probability, i.e., 100 percent probability of one or more takes occurring over the course of 30 years. The Service should modify the low-risk threshold from 0.03 eagles per year to 0.17 eagles per year, which will maintain a conservative basis for identifying low-risk projects.
- Low-risk permits should not be coupled with 30-year and other longer-term permit durations.
- Low-risk projects should be evaluated within the context of cumulative risk to local and regional eagle populations, as well as within the context of projected disturbance and habitat modification.
- The Service should establish criteria to identify low-risk activities and set up a more streamlined permit process to address these circumstances. For example, there could be a one-page permit criteria checklist submitted with the "take" permit application that qualifies a project for an exemption from NEPA or advanced conservation practices.
- The definition of low risk should be clearly defined and based not only on anticipated project take (mortality and disturbance), but also on habitat modification, and should also be defined in the context of cumulative risk to regional and local eagle populations.
- While the application process for low-risk permits should be streamlined, applicants should still be required to meet the same permit eligibility standard for avoidance through the implementation of ACPs.

- Low-risk permittees should be required to adhere to standardized monitoring, annual reporting requirements, and incidental take reporting sufficient to accurately capture any take.
- A low risk category for placement of wind energy facilities should be created in a transparent manner using data such as the American Bird Conservancy's Wind Risk assessment map.
- Low-risk permits should have standardized terms and conditions that are industry-specific and reviewed and updated on a periodic basis.
- Individual low-risk permit applications must be subject to a robust stakeholder review and comment process.
- When determining low risk projects, two separate models should be used for golden and bald eagles, which take into consideration the apparently different behavior and risk profiles of each species.
- The Service should consider some types of transportation projects as low-risk to nesting and roosting bald eagles, specifically those that are:
    - Similar to existing activities that eagles in the area are accustomed to;
    - Of limited duration, occurring no more than several days at a time;
    - Implementing various minimization measure to reduce impacts;
    - Not going to have a project noise level above 92 dB.
- Criteria to evaluate whether a project is considered low risk should include:
    - Proximity and view shed of proposed disturbance in relation to nesting habitat
    - Landscape level migration patterns
    - Quality of potential foraging habitat
    - Project activities that have a potential interaction with eagles/habitats
    - Timing of projects (short-term/long-term, within or outside of breeding season)
    - Specific operational practices (applicant-committed protection measures)
- The "low-risk" project category should be based on clearly defined disturbance thresholds, including, but not limited to, no surface occupancy (NSO) and seasonal buffers around nests.
- If a project is beyond the Service-recommended buffer distance from an eagle nest, the project should be considered "low risk" and the permit issued under a simplified and shortened application/approval permit process.

Cultural

- To address the cultural value of eagles, the Service should consult face-to-face, with the National Congress of American Indians and other tribal entities for their direction on this issue.
- In recognition of the continued lack of tribal engagement on these eagle matters, the Service should consult with and engage tribes, tribal religious and spiritual leaders, and tribal conservation and environmental experts regarding the development and implementation of federal policies related to eagles.

Research

- The Service should establish regular, consistent surveys to assess changes in population.
- The Service should undertake a well-defined research program that explores potential innovations in ACPs to supplement a menu of validated, effective measures.
- There is an opportunity for the Service to use utility data if they facilitate use of the reporting system and provide guarantee of security of data.
- The Service should actively pursue research on many factors that affect long-term population status of eagles in a changing landscape, including climate, prey populations, wind-farm losses, electrocutions, and lead poisoning.
- Research and monitoring efforts should be developed to:
    - Collect regional baseline population data;
    - Evaluate trends in population status;
    - Understand risk factors for take and improve risk assessment methodologies;
    - Identify and quantify threats to regional populations and the opportunities to reduce threats through compensatory mitigation;
    - Refine avoidance strategies;
    - Identify and assess the effectiveness of ACPs; and
    - Identify and assess the effectiveness of compensatory mitigation measures.
- The Service and its partners should conduct more detailed studies of eagle movements, prey populations, habitat use, and populations on a regional basis and use them to improve siting decisions.
- The Service should use modeling to simulate populations of known structure that are then impacted at Known (simulated) levels as a means to inform decisions. The substantial body of knowledge on bald eagles could serve as an initial benchmark for developing simulation models for golden eagles.
- Any dollars that come from enforcement and fines should be applied to fund eagle research.

Other

- The Service should consider shifting focus of the USFWS programmatic permit program from a lethal take focus to the conservation of eagles and their habitat.
- Consider the use and issuance of true programmatic approaches to planning that examine mitigation measures within the context of a local area population, or other regional characteristic, thereby adding population-scale data collection, analyses and mitigation efforts to the site-specific analysis that must occur for each individual take authorization.
- The preamble to the 2009 permit regulations, Final Environmental Assessment conducted for those regulations, and the ECP Guidance all identify projects in operation prior to 2009 as being part of baseline conditions on which take thresholds were established. In practice, however,

the Service has been inconsistent about how to treat such projects. The Service should clarify the extent to which mitigation is required for pre-2009 projects.

- The Service should treat known permitted take that occurred prior to 2009 as measureable when considering additional take, and not consider it "baseline."
- Some Service Regions have imposed a requirement that applicants prepare Service-approved Bird and Bat Conservation Strategies as part of the permit application. The regulations do not require this and evaluation of non-eagle species should not rise to the level of an approved plan for a Service decision in support of issuing an eagle take permit.
- Section 22.11(c) should be revised to state: "You must obtain a permit under part 21 of this subchapter for any activity that also involves migratory birds other than bald and golden eagles, and a permit under part 17 of this subchapter or a statement under Part 402 for any activity that also involves threatened or endangered species other than the bald eagle."
- The Service should consider issuing programmatic take permits to cover a company's entire service territory.
- The contents of the permit application form should be explicitly spelled out in the regulation. The preamble to the current regulations states that the application form requirements are purposefully absent so the Service can modify them without undergoing additional rulemaking. This lack of formal codification could lead to unintentional, pre-decisional actions by the Service, such as deeming applications incomplete.
- It would be beneficial for the public and government agencies to clearly understand the approximate (or maximum) length of time that it would take the Service to complete various eagle permit applications since the current process appears to differ from CFR 13.11.
- The regulations should specifically address the requirements for each type of permit. For example, they should clarify what level of studies, which types of documents are needed, the level of NEPA that is appropriate, and whether an ECP is required for each type of permit.
- A panel of eagle experts & eagle biologists should begin a review of the Eagle Act. The Eagle Act is old, very expensive, less complete and harder to enforce than the more current MBTA and ESA and it does not work well with current regulations.
- The Service should move forward with the development of a permitting process under the MBTA to augment those now available under BGEPA and ESA.
- The Service needs to enforce the ESA, BGEPA and MBTA when it comes to all energy development, whether traditional or alternative. Shut down or relocate wind energy sites that greatly exceed their take limits for federally-protected species, especially if mitigation proves ineffective in reducing bird (and bat) mortality. This means more prosecutions for violation of the laws and predictable consequences for non-compliance.

- The 2013 revisions to the permit regulations provide that the Service will make reported injury and mortality data available to the public. The regulation should clarify whether the Service will publish/post this data, or whether it will be available only upon filing a request under the Freedom of Information Act.
- The eagle depredation regulations at 50 CFR 22.23 state: "The tenure of any permit to take bald or golden eagles under this section is shown on the face of the permit. We will not issue these permits for terms longer than 90 days, …". This language should be amended to; "The tenure of any permit to take bald or golden eagles under this section is shown on the face of the permit. We will not issue these permits for terms longer than 90 days, *except permits for capture and relocation of eagle(s) for the protection of aviation safety and/or the eagle themselves. These types of exceptions may be issued up to one year. In addition, permits to authorize disturbance associated with hazing eagles from the vicinity may be valid for up to five years*."
- Regional Service control of golden eagles must be stopped and turned over to the states, as it is with ALL other birds of prey. Regional control has led to inefficiency and inconsistent implementation and enforcement of laws.
- The Service should make modifications to the other BGEPA regulations to ensure consistency among the regulations and to carry forward any changes to the programmatic permits.
- Many natural community restoration activities need to be conducted during a specific season or they will not be successful. Therefore, planning to avoid the eagle nesting season may not be an option, and failing to restore the natural community compromises ecosystem integrity.
- The scoping process documents mention timber harvesting as an activity for which a programmatic permit may be appropriate. However, timber harvesting should not qualify for programmatic permits because the current eagle management guidelines for timber harvesting are quite easy to follow.
- Clarify the regulations and guidance documents to specifically address the requirements for each type of permit. For example, clarify whether Eagle Conservation Plans (ECPs) are required for a nest removal permit when the project NEPA has evaluated impacts and established appropriate mitigation measures.
- Consider developing a "Nationwide" permit program, similar to the Section 404 Clean Water Act permits that allows for projects to qualify under specific categories (low-risk). These instances would permit take within an established threshold per category.
- Develop additional industry-specific guidance documents in addition to the wind energy guidance, transmission lines, etc., as the mineral mining industry does not easily fit into current guidance for Land-based Wind Energy due to major spatial and temporal differences in projects.
- Address in the regulations and guidance the roles and responsibilities of other permitting agencies. For example, if a project involving the removal of an inactive nest is being evaluated in a Bureau of Land Management (BLM)

document and with appropriate consultation, the Service would allow the BLM to become the lead agency and establish appropriate mitigation, which would then be written into the "take" permit. This will allow for a streamlined approach for permitting and NEPA.

- Incorporate permit review and process times into the regulations and clarify how permits are processed. It is preferred that they are processed in a manner that allows for low-risk standard permits to be processed expeditiously. In addition, no industry should be given priority over another. For example, a permit to support a wind energy project should not be given precedence over a permit to support a mining operation.
- The regulations should require permittees to allow access to state wildlife agency staff to monitor permit compliance. Currently, the regulations require permittees to allow Service personnel and other qualified persons designated by the Service such access.
- A portion of the permit fees should fund a permit writer in each regional office dedicated to eagle permits. This will allow for consistency and efficiency in processing applications and meeting permit timelines.
- The rule should incorporate provisions to allow land managers to engage in habitat management activities that are beneficial to wildlife or plants, such as prescribed burns, natural community restoration, and nuisance species abatement, without liability for temporary disturbance to eagle.
- Further standardization is needed across Regions to eliminate multiple Regional guidance documents. The national ECP Guidance should be the only guidance for the process of evaluating eagle risk and developing ECPs.
- The regulations should establish a standardized timeline for review proportional to the risk posed to eagles by any given project.
- The slow pace of the eagle permitting process often leaves projects at risk of unauthorized take between the time the project is constructed and when the permit is issued. EDPR NA recommends the Service provide a mechanism such as a Technical Assistance Letter that includes a set of criteria under which a project receives some level of protection from prosecution during the interim period.
- When a permit is transferred to another entity, the original permit holder should be responsible for all mitigation requirements that were required during the period of their ownership. Allowing the new permittee to take responsibility for the outstanding mitigation requirements may provide a disincentive for the original permit holder to carry out the mitigation.
- The Service should work with utilities to better understand their construction, operation, and maintenance practices to better identify permitting categories and risk factors/categories for take.
- The fees for these programmatic permits increased substantially. The money from these fees should be used for wildlife conservation, mitigation and monitoring in the region affected.
- The Service should look to the more efficient permitting systems that federal agencies have used successfully for years under other regulatory programs.

The Service could implement a programmatic industry permit with NEPA tiering as the Service uses for permits issued under the ESA or a general permit program similar to that utilized by the Army Corps of Engineers per the Nationwide Permit program under the Clean Water Act.

- Implementation of Avian Protection Plans allows for a cooperative model to address concerns, rather than through a more rigid permitting scheme that adds cost to avian protection activities. To maintain this flexibility, development and implementation of APPs should remain a viable option to address the same concerns that a 30-year programmatic permit would address.
- As neither the Eagle Act nor the actual regulations require that eagle take permits be available solely for individual projects, the Service should allow for multi-project/facility permit for bald eagles or regional permits that can serve as umbrella permits for individual projects. Bald eagle populations continue to grow exponentially in much of the country, and as these populations grow, so do the numbers of incidental take. Therefore, a set amount of authorized take over a period of time (i.e., 30 years) can be unpredictable and impractical. As long as the population growth exceeds the take and the overall goal of stable or increasing bald eagle population is being met, no individual permits would be necessary. Such regional permits could also be used for golden eagle take in projects that are considered low-risk.
- The Service should make modifications to other Eagle Act permit regulations to ensure consistency among the regulations and to carry forward the concepts identified above. For example, a programmatic permit to take golden eagle nests under section 22.25 (removal of nests for resource development and recovery operations) should be the same length of time as other programmatic permits and should not contain more stringent requirements to obtain a permit than what would be authorized under section 22.26 and 22.27.
- Similarly, the ESA and its implementing regulations at 50 CFR 17.31, the eagle permit regulations should include provisions for state wildlife agencies to take eagles as part of the agencies' management activities, for example, aiding injured or sick individuals, disturbing eagles while undergoing habitat management, salvaging carcasses, euthanizing mortally wounded eagles, and removing nest for specific management purposes.
- The regulations should clarify "disturbance" as it relates to eagle take and how the Service may use disturbance to infer a permit requirement.
- The Service should establish and clearly define in the management objectives acceptable distances from eagle nests that are necessary to avoid disturbance of eagles in a given management area.
- Wind turbines with predictable eagle mortality should not be permitted and those already permitted with future predictable mortality should be taken offline.

- The revised regulations should clarify if the provisions of the Eagle Act usurp the authority of the Endangered Species Act (ESA). The Service has made it difficult or impossible to obtain a permit to remove a golden eagle nest to protect California condors at their release site.
- New regulations should provide more information as to what other entities are expected to apply for programmatic permits. Will the regulations affect the aviation industry if there are more eagle strikes? Will they apply to state natural resource agencies if there is an increase in non-target eagle catch associated with recreational trapping?

Appendix A: Federal Register Notice

http://www.fws.gov/policy/library/2014/2014-14497.html

[Federal Register Volume 79, Number 120 (Monday, June 23, 2014)]
[Notices]
[Pages 35564-35567]
From the Federal Register Online via the Government Printing Office
[www.gpo.gov]
[FR Doc No: 2014-14497]

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[Docket No. FWS-R9-MB-2011-0094;FF09M21000-145-FXMB123109EAGLE]

Eagle Permits; Notice of Intent To Prepare an Environmental Assessment or an Environmental Impact Statement

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of intent; notice of public scoping meetings; request for comments.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service, us, or we), announce five public scoping meetings to inform our decision to prepare either an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, in conjunction with an evaluation of our eagle management objectives. The decision to initially prepare an EA or EIS will be, in part, contingent on the complexity of issues identified during, and following, the scoping phase of the NEPA process. The scoping meetings will provide an opportunity for input from other agencies, Tribes, nongovernmental organizations, and the public on the scope of the NEPA analysis, the pertinent issues we should address, and alternatives we should analyze.

DATES: To ensure consideration of written comments, they must be submitted on or before September 22, 2014. See SUPPLEMENTARY INFORMATION for the locations and dates of the scoping meetings.

ADDRESSES: See SUPPLEMENTARY INFORMATION for the locations of the scoping meetings. To obtain additional information about the topics that will be presented at the public scoping meetings, go to http://www.eaglescoping.org. You may submit written comments by one of the following methods:

Electronically: Go to the Federal e-Rulemaking Portal: http://www.regulations.gov. Search for FWS-R9-MB-2011-0094, which is the docket number for this notice, and follow the directions for submitting comments.

By Hard Copy: Submit by U.S. mail to Public Comments Processing, Attn: FWS-R9-MB-2011-0094; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042-PDM, Arlington, VA 22203.

Please note in your submission that your comments are in regard to Eagle Management and Permitting. We request that you send comments by only one of the methods described above. We will post all information received on http://www.regulations.gov. This generally means that we will post any personal information you provide us (see the Public Availability of Comments section below for more information).

FOR FURTHER INFORMATION CONTACT: Eliza Savage, at 703-358-2329 (telephone), or eliza_savage@fws.gov (email). Individuals who are hearing impaired or speech impaired may call the Federal Relay Service at 800-877-8337 for TTY assistance. Alternatively, information presented at the public scoping meetings can be viewed at http://www.eaglescoping.org.

SUPPLEMENTARY INFORMATION:

Public Scoping Meetings

We will hold informal public informational sessions and present currently identified issues at the following dates and times:

1. July 22, 2014: Sacramento, CA, 5 p.m. to 8 p.m., Red Lion Hotel, Woodlake Conference Center, 500 Leisure Lane, Sacramento, 95815.
2. July 24, 2014: Minneapolis, MN, 5 p.m. to 8 p.m., DoubleTree Bloomington--MSP South, 7800 Normandale Blvd., Bloomington, MN 55439.
3. July 29, 2014: Albuquerque, NM, 5 p.m. to 8 p.m., DoubleTree Albuquerque, 201 Marquette Avenue Northwest, Albuquerque NM 87102.
4. July 31, 2014: Denver, CO, 5 p.m. to 8 p.m., Holiday Inn Denver Airport, 6900 Tower Rd, Denver, CO 80249.
5. August 7, 2014: Washington, DC, 1 p.m. to 5 p.m., South Interior Building, 1951 Constitution Ave NW., Washington, DC 20240.

Background

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) (Eagle Act) prohibits take of bald eagles and golden eagles except pursuant to Federal regulations. The Eagle Act regulations at title 50, part 22 of the Code of Federal Regulations (CFR), define the ``take'' of an eagle to include the following broad range of actions: ``pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb'' (Sec. 22.3). The Eagle Act allows the Secretary of the Interior to authorize certain otherwise prohibited activities through regulations. The Secretary is authorized to prescribe regulations permitting the ``taking, possession, and transportation of [bald eagles or golden eagles] . . . for the scientific or exhibition purposes of public museums, scientific societies, and zoological parks, or for the religious purposes of Indian tribes, or . . . for the protection of wildlife or of agricultural or other interests in any particular locality,'' provided such permits are ``compatible with the preservation of the bald eagle or the golden eagle'' (16 U.S.C. 668a).

On September 11, 2009, we published a final rule that established two new permit regulations under the Eagle Act (50 FR 46836). One permit authorizes take (removal, relocation, or destruction) of eagle nests (50 CFR 22.27). The other permit type authorizes nonpurposeful take of eagles (50 CFR 22.26). The nonpurposeful eagle take regulations provide for permits to take bald eagles and golden eagles where the taking is associated with, but not the purpose of, an activity. The regulations provide for standard permits, which authorize individual instances of take that cannot practicably be avoided, and

[[Page 35565]]

programmatic permits, which authorize recurring take that is unavoidable even after implementation of advanced conservation practices. We have issued standard permits for commercial and residential construction, transportation projects, maintenance of utility lines and dams, and in a variety of other circumstances where take is expected to occur in a limited timeframe, such as during clearing and construction.

``Programmatic take'' of eagles is defined at 50 CFR 22.3 as ``take that is recurring, is not caused solely by indirect effects, and that occurs over the long term or in a location or locations that cannot be specifically identified.'' Take that does not reoccur, or that is caused solely by indirect effects, such as short-term construction, does not require a programmatic permit. For additional explanation of programmatic take and programmatic permits, see 74 FR 46841-46843.

We can issue programmatic permits for disturbance as well as take resulting in mortalities, based on implementation of ``advanced conservation practices'' developed in coordination with the Service. ``Advanced conservation practices'' are defined at 50 CFR 22.3 as ``scientifically supportable measures that are approved by the Service and represent the best available techniques to reduce eagle disturbance and ongoing mortalities to a level where remaining take is unavoidable.'' Most take authorized under Sec. 22.26 to this point has been in the form of disturbance; however, permits may authorize lethal take that is incidental to an otherwise lawful activity, such as mortalities caused by collisions with rotating wind turbines.

The Eagle Act requires the Service to determine that any take of eagles it authorizes is compatible with the preservation of bald eagles or golden eagles. In the preamble to the final regulations for eagle nonpurposeful take permits, and in the Final Environmental Assessment of the regulations, we defined that standard to mean ``consistent with the goal of stable or increasing breeding populations'' (74 FR 46838).

On April 13, 2012, the Service initiated two additional rulemakings: (1) A proposed rule (``Duration Rule'') to extend the maximum permit tenure for programmatic eagle nonpurposeful take permit regulations from 5 to 30 years (77 FR 22267), and (2) an Advance Notice of Proposed Rulemaking (ANPR) soliciting input on all aspects of those eagle nonpurposeful take regulations (77 FR 22278). The ANPR highlighted three issues on which the Service particularly hoped the public would comment: Eagle population management objectives, compensatory mitigation, and programmatic permit issuance criteria.

The Duration Rule was finalized on December 9, 2013 (78 FR 73704). Under the revised regulations, the maximum term for programmatic permits was extended from 5 to 30 years. This change is intended to facilitate the responsible development of projects that will be in operation for many decades and bring them into compliance with statutory mandates protecting eagles. The longer term permits will incorporate conditions that provide for adaptive management. Permits issued for periods longer than 5 years are available only to applicants who commit to implementing adaptive management measures if monitoring shows the measures are needed and likely to be effective. The required adaptive management measures will be negotiated with the permittee at the outset and specified in the terms and conditions of the permit.

At no more than 5-year intervals from the date a permit is issued, permittees must compile a report documenting any fatalities and other pertinent information for the project and submit the report to the Service. The Service will evaluate each permit to reassess fatality rates, effectiveness of measures to reduce take, the appropriate level of compensatory mitigation, and eagle population status. Depending on the findings of the review, permittees may be required to undertake additional conservation measures consistent with the permit. The Service will make mortality information from both the annual and the 5-year compilation report available to the public.

Management Objectives for Bald and Golden Eagles

The language of the Bald and Golden Eagle Protection Act provides flexibility with regard to defining management objectives for bald and golden eagles. The management objective directs strategic management and monitoring actions and, ultimately, determines what level of permitted eagle removal can be allowed.

We are considering modifying current management objectives for eagles, which were established with the 2009 eagle permit regulations and Final Environmental Assessment of our regulatory permitting system under the Eagle Act. Different management objectives could be set for bald and golden eagles. At least four elements may be considered when establishing a management objective: (1) The population objective and relevant timeframe for it to be met; (2) eagle management units (EMUs), or the geographic scale over which permitted take is regulated to meet the population objective; (3) whether we also set an upper limit on take at a finer scale than the EMU to avoid creating population sinks in local breeding populations; and (4) our level of risk tolerance. The level of risk tolerance means how much risk the agency is willing to take when information is uncertain in carrying out management actions (e.g., setting levels of authorized take). For example, when information is less certain, a more conservative approach may be adopted to avoid unintended outcomes. Alternatively, to provide for more flexibility in permitting, the Service could adopt a more risk-tolerant approach.

The current management objective, also referred to as the ``Eagle Act preservation standard,'' is to manage populations consistent with the goal of maintaining stable or increasing breeding populations over 100 years, which is at least five eagle generations. The scale the Service uses to evaluate eagle populations is referred to as eagle management units. EMUs for the golden eagle were set at the Bird Conservation Region (BCR) level because the only range-wide estimates available for the golden eagles are BCR-scale population estimates. To establish management populations for bald eagles, we used natal populations (eagles within the natal dispersal range of each other) in our evaluation in order to look at distribution across the landscape. (Natal dispersal refers to the movement between hatching location and first breeding or potential breeding location.) Because the populations delineated by this approach roughly correspond to the Service's Regional organizational structure, we have been managing bald eagles based on populations within the eight Service Regions, with some shared populations. Estimates of bald and golden eagle population size in each EMU were calculated, and EMU-specific estimates of demographic rates were used in models to determine rates of authorized take that are compatible with maintaining stable breeding populations.

Under the current management approach, permitted take of bald eagles is capped at 5 percent estimated annual productivity for bald eagles. Because the Service lacked data to show that golden eagle populations could sustain any additional unmitigated mortality at that time, we set take thresholds for that species at zero for all regional populations. This means that any new authorized ``take'' of golden eagles must be at least equally offset by

[[Page 35566]]

compensatory mitigation (specific conservation actions to replace or offset project[hyphen]induced losses). For more details and explanation about the current eagle management approach, see the 2009 Final Environmental Assessment, Proposal to Permit Take as Provided Under the Bald and Golden Eagle Protection Act, which can be found at: http://www.fws.gov/migratorybirds/BaldAndGoldenEagleManagement.htm.

The Service also developed and applies guidance on upper limits of take at more local scales to manage cumulative impacts to local populations. Under the guidance, the Service must assess take rates both for individual projects and for the cumulative effects of other human-caused take eagles, at the scale of the local[hyphen]area eagle population. The local-area population is the population of eagles within the natal dispersal distance. The Service considers this distance to represent the geographic area that would provide recruits to replenish a local population if permitted take caused a decline in the breeding population of eagles around a permitted project. The Service identified take rates of between 1 and 5 percent of the total estimated local[hyphen]area eagle population as significant, with 5 percent being at the upper end of what might be appropriate under the Eagle Act preservation standard, whether offset by compensatory mitigation or not.

The Service is considering a range of possible alternatives to the current management objective. At one end of the spectrum, we could adopt a qualitative objective such as ``to not meaningfully impair the bald or golden eagle's continued existence.'' Alternatively, we could update the current management objective by incorporating newer, improved information on eagle movements, population size, and natal dispersal distances to revise the EMUs; set explicit numerical population objectives in each EMU; and refine the area we consider the local scale. We could also adopt an explicit level of risk tolerance relative to how much take to allow based on uncertainty in the population size estimates.

The scoping process announced today in this notice will inform our eagle management program and our decision to prepare either an EA or an Environmental Impact Statement (EIS). Service staff who have been implementing the 2009 eagle permit regulations have identified a number of priority issues for evaluation during this scoping process, including the following: Eagle population management objectives; programmatic permit conditions; compensatory mitigation; evaluation of the individual and cumulative effects of low-risk (or low-effect) permits; and criteria for nest removal permits. For more information about these topics visit http://www.eaglescoping.org. In addition to these topics, during this scoping process, we invite the public to provide input on any aspect of our eagle management program.

Analysis Under the National Environmental Policy Act

The NEPA analysis will evaluate the environmental effects of a range of alternatives for eagle management. We also intend the NEPA analysis to:

Evaluate up-to-date information about the status of bald and golden eagle populations;

Enable the Service to recalculate regional take thresholds for both species (if population management will continue to incorporate regional take thresholds);

Analyze the effects of issuing permits to take golden eagles and bold eagles throughout the U.S.;

Further analyze the effects of longer term nonpurposeful take permits; and

Rigorously evaluate the effects of low-risk (low-effect) projects to allow for more efficient permitting at the individual project level.

The purpose of the public scoping process with regard to NEPA is to determine relevant issues that could influence the scope of the environmental analysis, including alternatives, and guide the process for developing the EA or EIS and related compliance efforts. Factors currently being considered for analysis in the EA or EIS include, but are not limited to:

1. The direct, indirect, and cumulative effects that implementation of any reasonable alternative could have on bald and golden eagles, migratory birds, other wildlife species, and their habitats;
2. Direct, indirect, and cumulative effects of projects that are likely to take a minimal number of eagles and as such can be classified as ``low-risk'' or ``low effect'' and for which permitting at the individual project level could be expedited;
3. Effects to cultural resources;
4. Potentially significant impacts on biological resources, land use, air quality, water quality, water resources, economics, and other environmental/historical resources;
5. Strategies for avoiding, minimizing, and mitigating the impacts to eagles, migratory birds, wildlife, and other resources listed above;
6. Climate change effects; and
7. Any other environmental issues that should be considered with regard to potential alternatives for eagle management.

The final range of reasonable alternatives and mitigation to be analyzed in the draft EA or EIS will be determined in part by the comments received during the scoping process. The public will also have a chance to review and comment on the draft EA or EIS when it is available (a notice of availability will be published in the Federal Register).

Public Comments

We are requesting information from other interested government agencies, Native American Tribes, the scientific community, industry, nongovernmental organizations, and other interested parties.

You may submit your comments and materials by one of the methods described above under ADDRESSES at the beginning of this notice. Written comments will also be accepted at the public meetings, although these public meetings are primarily intended to provide additional information and provide a chance for the public to ask questions.

Public Availability of Comments

Written comments we receive become part of the public record associated with this action. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that the entire comment--including your personal identifying information--may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public disclosure in their entirety.

References

U.S. Fish and Wildlife Service. 2009. Final Environmental Assessment: Proposal to Permit Take as Provided Under the Bald and Golden Eagle Protection Act. U.S. Fish and Wildlife Service, Washington, DC U.S.A.

Authority

The authorities for this action are the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) and the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.).

[[Page 35567]]

Dated: June 16, 2014.
Jerome Ford,
Assistant Director, Migratory Birds.
[FR Doc. 2014-14497 Filed 6-20-14; 8:45 am]
BILLING CODE 4310-55-P

Appendix B: News Release

Service Begins Process to Reviewing Eagle Management Objectives, Non-Purposeful Take Permits

Jun 20, 2014

Service Begins Process of Reviewing Eagle Management Objectives, Non-Purposeful Take Permits
Public Scoping Meeting July 22 in Sacramento

Contact:
Laury Parramore, 703-358-2541
laury_parramore@fws.gov

Washington - The U.S. Fish and Wildlife Service today announced a process to engage the public as it works toward revising a rule governing how permits are issued for the non-purposeful take of bald and golden eagles. These regulations under the Bald and Golden Eagle Protection Act relate to permits where the take of eagles is associated with, but not the purpose of, otherwise lawful activities.

The Service will host five public information meetings in various locations around the country and open a 90-day public comment period. The meetings will be held on July 22, 2014, in Sacramento, Calif.; July 24, 2014, in Minneapolis, Minn.; July 29, 2014, in Albuquerque, N.M.; July 31, 2014, in Denver, Colo.; and Aug. 7, 2014, in Washington, D.C.

"The Service is committed to an open and transparent process, and we value the additional information public input can provide to make the final rule robust and as effective as possible," said Service Director Dan Ashe.

The public information sessions will serve as scoping meetings as required under the National Environmental Policy Act (NEPA). The Service will review information from the meetings and use it to prepare either a draft Environmental Assessment (EA) or Environmental Impact Statement (EIS) and proposed revisions to the permit regulations. The Service will then open another comment period for an additional round of public review and input before finalizing the EA/EIS and revised permit regulations.

As part of this scoping process, the Service is requesting information from government agencies, Native American tribes, the scientific community, industry, non-governmental organizations and other interested parties in light of the Service's overall reexamination of its 2009 permit regulations and eagle management objectives. This reexamination includes, among other things, a December 2013 revision to regulations extending the maximum duration for programmatic eagle non-purposeful take permits from five to 30 years.

“The bald eagle's recovery from near extinction in the lower 48 states is an American success story, written in part by the Service, the dedication of its staff, its leadership in eagle conservation, and its administration and enforcement of the Endangered Species Act and Bald and Golden Eagle Protection Act,” said Ashe. “The Service remains committed to the conservation of bald and golden eagles, and the final rule will be consistent with the long-term conservation of eagle populations across the nation.”

The process to revise the eagle rule began in April 2012, when the Service put forth an Advanced Notice of Rulemaking (ANPR) about permits for non-purposeful take of eagles. The ANPR highlighted three issues on which the Service invited public comment: eagle population management objectives, compensatory mitigation and programmatic permit issuance criteria. The upcoming public information meetings are a continuation of this process.

For more information about the public information meetings, please visit http://www.eaglescoping.org .

Written comments must be submitted on or before Sept. 22, 2014, by one of the following methods:

Electronically: Federal e-Rulemaking Portal: http://www.regulations.gov FWS-R2-MB-2011-0094 or by hard copy: Submit by U.S. mail to Public Comments Processing, Attention: Eagle Management and Permitting FWS-R2-MB-2011-0094; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042-PDM, Arlington, VA 22203. Comments will be posted all information received on http://www.regulations.gov

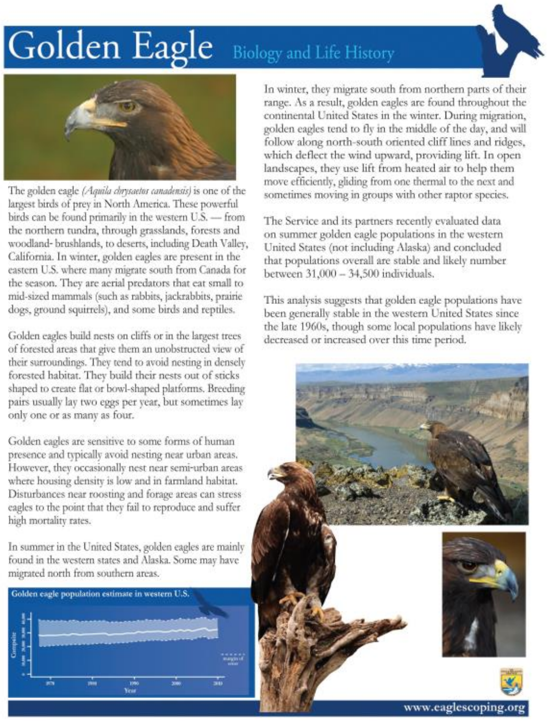
The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. We are both a leader and trusted partner in fish and wildlife conservation, known for our scientific excellence, stewardship of lands and natural resources, dedicated professionals, and commitment to public service. For more information on our work and the people who make it happen, visit www.fws.gov.

Appendix C: Overview Presentation of Issues

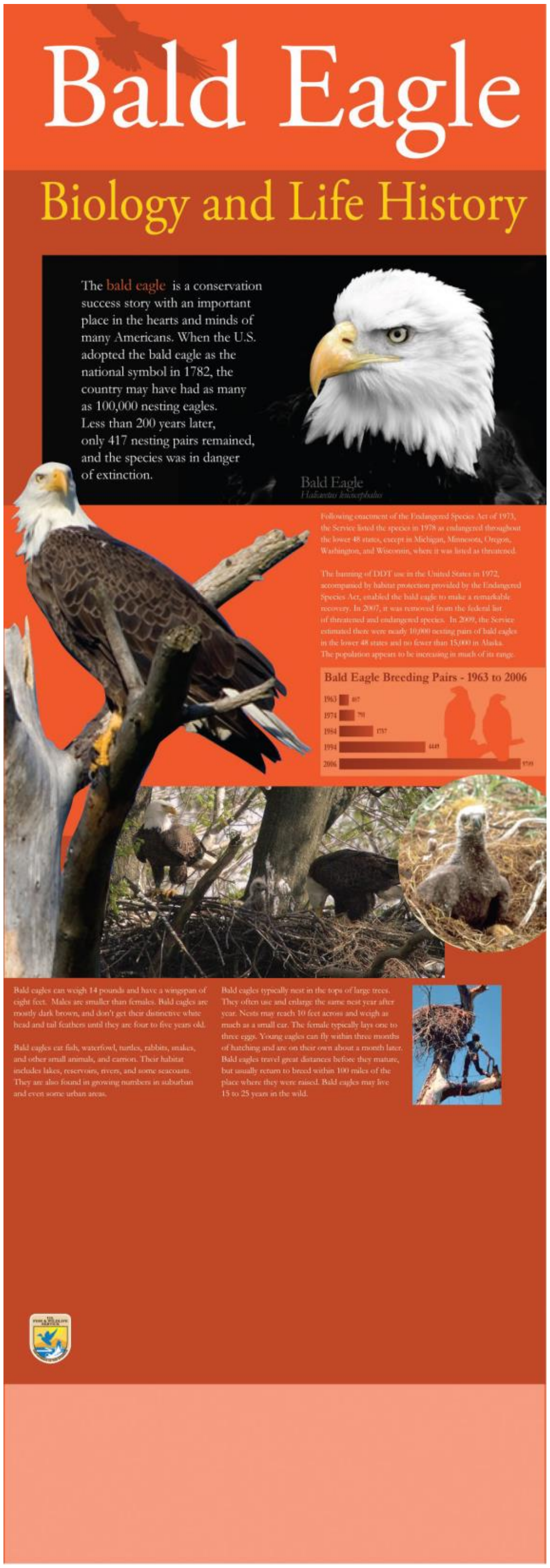
The following video was developed and shown at a station near the entrance to the room on a repeating loop, as well as online at the public scoping website http://www.eaglescoping.org.

To view the video on the Service's YouTube channel, go to:
http://youtu.be/cNu4moE8orA

Appendix D: Eagle Management Display Banner & Handout



Appendix E: Eagle Management Display Banner & Handout



Bald Eagle

Biology and Life History

The bald eagle is a conservation success story with an important place in the hearts and minds of many Americans. When the U.S. adopted the bald eagle as the national symbol in 1782, the country may have had as many as 100,000 nesting eagles. Less than 200 years later, only 417 nesting pairs remained, and the species was in danger of extinction.

Bald Eagle

Haliaeetus leucocephalus

Following enactment of the Endangered Species Act of 1973, the Service listed the species in 1978 as endangered throughout the lower 48 states, except in Michigan, Minnesota, Oregon, Washington, and Wisconsin, where it was listed as threatened.

The banning of DDT use in the United States in 1972, accompanied by habitat protection provided by the Endangered Species Act, enabled the bald eagle to make a remarkable recovery. In 2007, it was removed from the federal list of threatened and endangered species. In 2009, the Service estimated there were nearly 10,000 nesting pairs of bald eagles in the lower 48 states and no fewer than 15,000 in Alaska. The population appears to be increasing in much of its range.

Bald eagles can weigh 14 pounds and have a wingspan of eight feet. Males are smaller than females. Bald eagles are mostly dark brown, and don't get their distinctive white head and tail feathers until they are four to five years old.

Bald eagles eat fish, waterfowl, turtles, rabbits, snakes, and other small animals, and carrion. Their habitat includes lakes, reservoirs, rivers, and some seacoasts. They are also found in growing numbers in suburban and even some urban areas.

Bald eagles typically nest in the tops of large trees. They often use and enlarge the same nest year after year. Nests may reach 10 feet across and weigh as much as a small car. The female typically lays one to three eggs. Young eagles can fly within three months of hatching and are on their own about a month later. Bald eagles travel great distances before they mature, but usually return to breed within 100 miles of the place where they were raised. Bald eagles may live 15 to 25 years in the wild.

Bald Eagle Biology and Life History

The bald eagle *(Haliaeetus leucocephalus)* is a conservation success story with an important place in the hearts and minds of many Americans. When the U.S. adopted the bald eagle as the national symbol in 1782, the country may have had as many as 100,000 nesting eagles. The first major decline of the species probably began in the mid to late 1800s, coinciding with the decline of waterfowl, shorebirds, and other prey.

Fifty years ago, the bald eagle was in danger of extinction throughout much of its range (from Alaska and Canada to northern Mexico). Habitat destruction and degradation, illegal shooting and DDT decimated bald eagle populations. By 1963, with only 417 nesting pairs of bald eagles remaining, the species was in danger of extinction. In 1967, the Secretary of Interior listed bald eagles south of the 40th parallel under the Endangered Species Preservation Act of 1966. Following enactment of the Endangered Species Act of 1973, the Service listed the species in 1978 as endangered throughout the lower 48 states, except in Michigan, Minnesota, Oregon, Washington, and Wisconsin, where it was designated as threatened.

The banning of DDT use in the United States in 1972, accompanied by habitat protection provided by the Endangered Species Act, enabled bald eagles to make a remarkable recovery. As the bald eagle recovered, its status was upgraded to threatened throughout the lower 48 states in 1995. In 2007, it was removed from the federal list of threatened and endangered species. In 2009, the Service estimated there were between 8,500 and 10,000 nesting pairs of bald eagles in the lower 48 states and no fewer than 15,000 in Alaska. The Service is currently evaluating data to revise the estimate for the lower 48. No official numbers are available at this time, but the population appears to be increasing in much of its range.

Bald eagles can weigh 14 pounds and have a wingspan of eight feet. Males are smaller than females. Bald eagles are mostly dark brown, and don't get their distinctive white head and tail feathers until they are four to five years old.

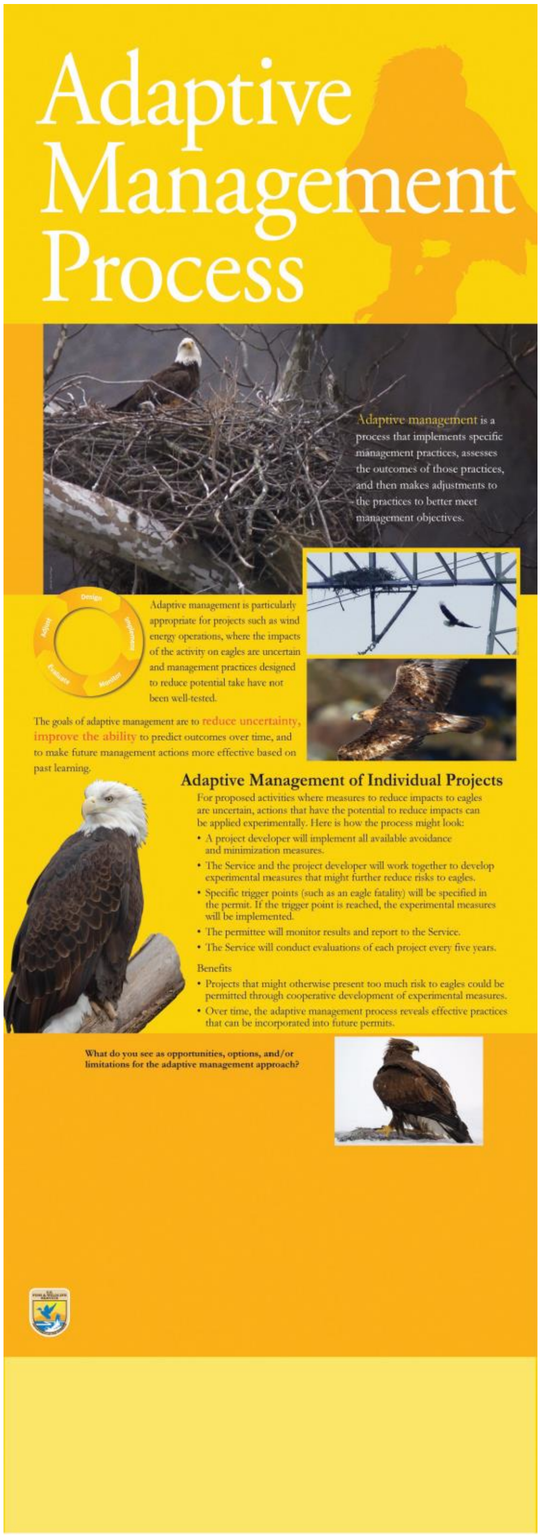
Bald eagles eat fish, waterfowl, turtles, rabbits, snakes, and other small animals, and carrion. Their habitat includes estuaries, large lakes, reservoirs, rivers, and some seacoasts. They are also found in growing numbers in suburban and even some urban areas. During the winter, they tend to congregate near open water in tall trees for shelter or spotting prey.

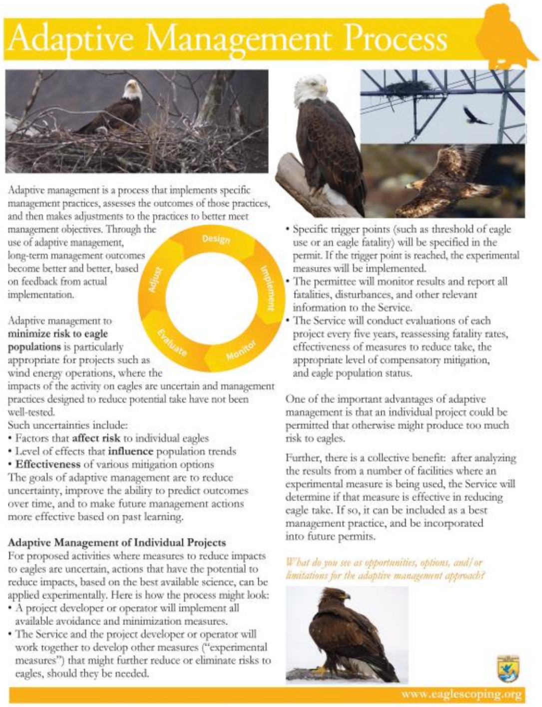
Bald eagles typically nest in the tops of large trees. They often use and enlarge the same nest year after year. Nests may reach 10 feet across and weigh as much as a small car. A breeding pair may also have one or more alternate nests within its breeding territory. In treeless regions, they may nest in cliffs or on the ground. The female typically lays one to three eggs, which hatch after about 35 days. Young eagles can fly within three months of hatching and are on their own about a month later. Disease, lack of food, bad weather, and human interference can kill eaglets, but about 70% survive their first year of life. The survival rate of eaglets is even higher in some areas, such as Florida, where it can be nearly 90%. Bald eagles travel great distances before they mature, but usually return to breed within 100 miles of the place where they were raised. Bald eagles may live 15 to 25 years in the wild.

www.eaglescoping.org

Appendix F: Eagle Management Display Banner & Handout

Appendix G: Eagle Management Display Banner & Handout





Appendix H: Eagle Management Display Banner & Handout

Compensatory Mitigation

In general, the term "mitigation" refers to measures taken to lessen or offset adverse impacts from an action. Broadly speaking, mitigation includes: avoidance, minimization, rectification, reduction or elimination over time, and compensatory mitigation. Compensatory mitigation is mitigation that "compensates" for impacts that were not avoided or minimized.

Currently, the eagle nonpurposeful take regulations require all permittees to avoid and minimize impacts to eagles. Additional, compensatory mitigation has been required for:

- Impacts to eagles that could not practicably be avoided. However, such compensatory mitigation has not been required for every permit. A variety of actions have been required, including, but not limited to: habitat preservation, construction of nest platforms, in lieu fees, and funding for conservation education programs.
- Take of eagles that would exceed Service-established take thresholds. In these cases, the Service requires compensatory mitigation to essentially "replace" (by saving from another lethal threat) the number of eagles taken in excess of the threshold. The Service has adopted the term "replacement mitigation" for this approach. An example of replacement mitigation is power pole retrofitting, which reduces eagle electrocutions. After years of monitoring electrocutions and retrofits, the Service can estimate how many power line poles must be altered to reduce existing fatalities. However, there are other actions with the potential to serve as replacement mitigation, such as carcass removal from highways and reduction of lead available to eagles.

The Service would like to establish consistent standards for when compensatory mitigation would be required under permits.

The range of options is wide, but can be simplified into these approaches (one or more of which could be adopted):

1. Require replacement mitigation for take that exceeds established take thresholds.
2. Require compensatory mitigation for all authorized take. There could be some scaled level of compensatory mitigation for every permit, with minimal restrictions on how the money could be spent so long as it was for eagle conservation.
3. Require compensatory mitigation under some predetermined circumstances for take that is within established thresholds but nevertheless may affect the long-term preservation of eagles (for example, when habitat is significantly degraded; for loss of a traditional communal roost; or if necessary to offset impacts to the local area eagle population).

Under what circumstances do you think the regulations should require compensatory mitigation?

What additional actions other than power pole retrofits, lead abatement, and carcass removal should be analyzed for replacement mitigation?

If general "mitigation funds" are established, what types of mitigation or other conservation measures should they support in order to maximize benefits to eagles?

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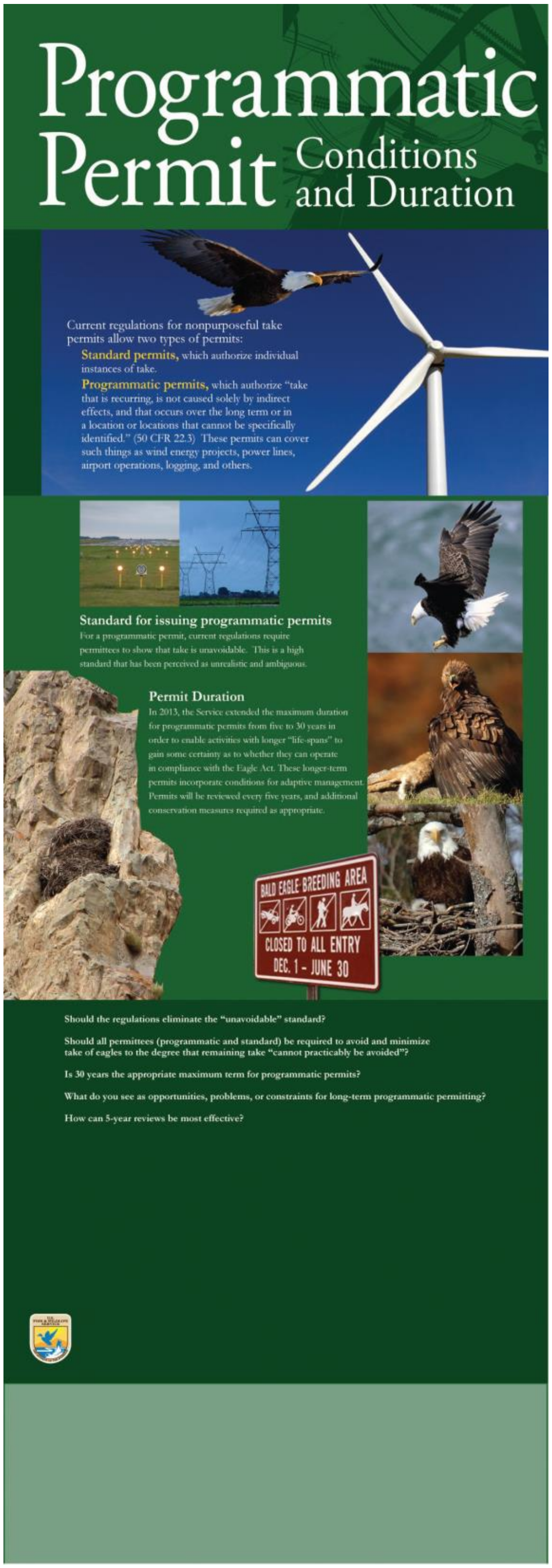
Appendix I: Eagle Management Display Banner & Handout



Programmatic Permit Conditions and Duration

Current regulations for nonpurposeful take permits provide for two types of permits:

1) **Standard permits**, which authorize individual instances of take.

2) **Programmatic permits**, which authorize “take that is recurring, is not caused solely by indirect effects, and that occurs over the long term or in a location or locations that cannot be specifically identified.” (50 CFR 22.3) These permits can cover activities and infrastructure such as wind energy projects, electric transmission and distribution lines, airport operations, timber harvesting, and others.

Standard for issuing programmatic permits

To qualify for a programmatic permit, current regulations require implementation of “advanced conservation practices” that reduce eagle disturbance and ongoing mortalities to a level where remaining take is unavoidable. However, requiring take to be “unavoidable” for programmatic permits is a high standard that has been perceived as unrealistic and ambiguous.

Should the regulations eliminate the “unavoidable” standard?

Should all permittees (programmatic and standard) be required to avoid and minimize take of eagles to the degree that remaining take “cannot practicably be avoided”?

Permit Duration

On December 9, 2013, the Service revised its regulations to extend the maximum permit duration for programmatic eagle non-purposeful take permits from five to 30 years. The purpose of allowing permits to be valid for more than five years is to enable activities with longer “life-spans” to gain some certainty as to whether they can operate in compliance with the Eagle Act.

BALD EAGLE BREEDING AREA
CLOSED TO ALL ENTRY
DEC. 1 - JUNE 30

Under the revised regulations, the longer-term permits incorporate conditions for adaptive management. Permits will be reviewed every five years and, if additional measures specified in the permit are necessary to ensure preservation of the eagle, the permittee will be required to implement those additional measures.

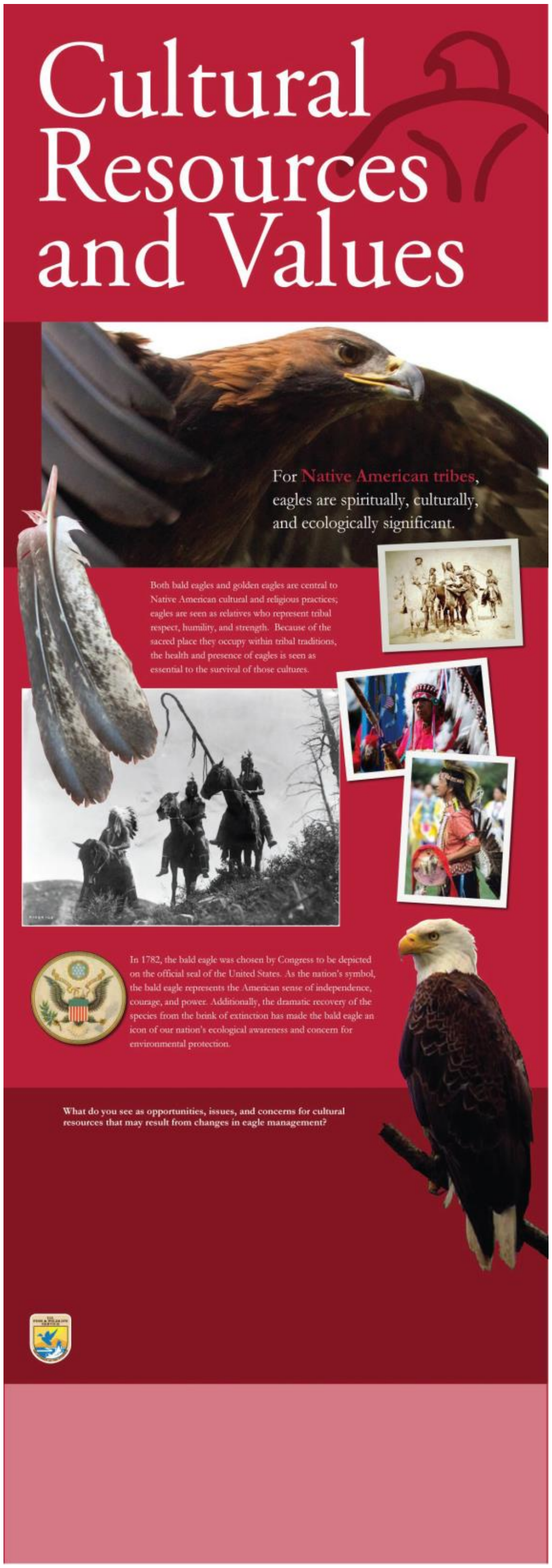
Is 30 years the appropriate maximum term for programmatic permits?

What do you see as opportunities, problems, or constraints for long-term programmatic permitting?

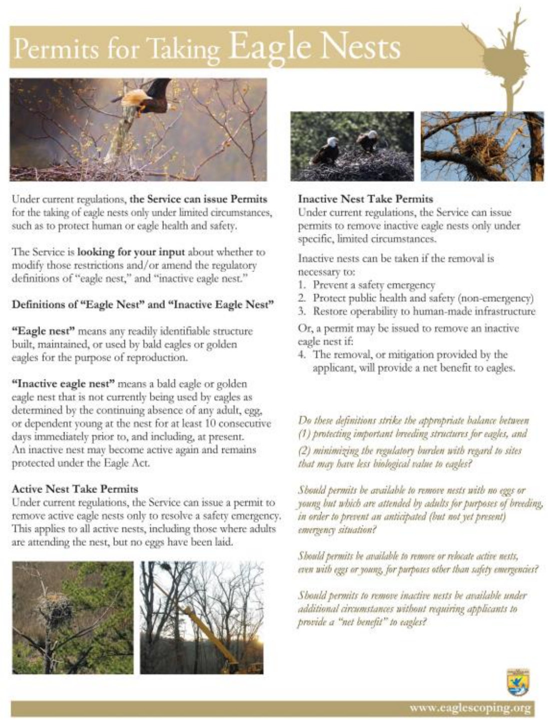
How can 5-year reviews be most effective?

www.eaglescoping.org

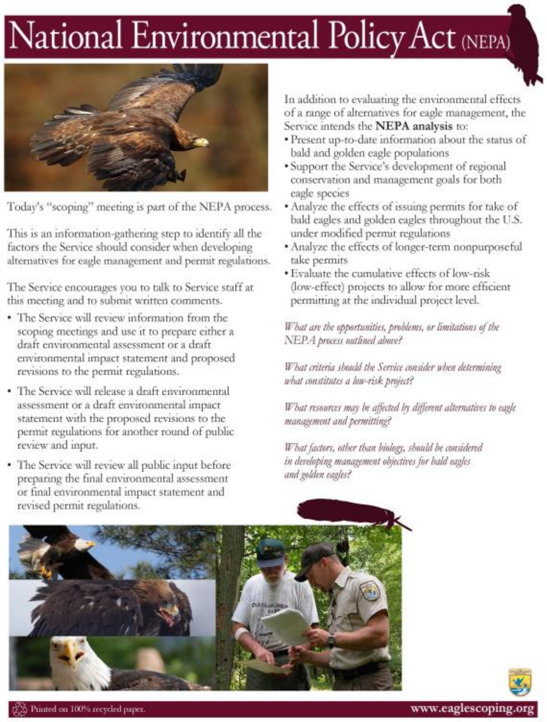
Appendix J: Eagle Management Display Banner & Handout



Appendix K: Eagle Management Display Banner & Handout



Appendix L: Eagle Management Display Banner & Handout



Appendix M: Eagle Management Display Banner & Handout

Appendix N: Comment Card

7. National Environmental Policy Act:

8. Eagle Research:

9. Other Topics/Issues Related to Bald and Golden Eagles:

For more information about the eagle scoping process, visit www.eaglescoping.org

All written comments become part of the public record associated with this action. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that the entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public disclosure in their entirety.

Bald and Golden Eagle Management

Public Scoping Meeting

Comment Form

Welcome to this public scoping meeting on bald and golden eagle management. The U.S. Fish and Wildlife Service (Service) is analyzing various aspects of bald and golden eagle management as part of its responsibility under the National Environmental Policy Act (NEPA).

This analysis will evaluate the environmental effects of a range of alternatives for eagle management, and possible changes to permit regulations for nonpurposeful take of eagles and take of eagle nests.

The purpose of the public scoping process is to identify relevant issues that could influence the scope of the analysis, including alternatives, and guide the process for developing an environmental assessment (EA) or environmental impact statement (EIS). The final range of reasonable alternatives and mitigation to be analyzed in the draft EA or EIS will be determined in part by the comments received during the scoping process.

Please talk with Service staff and review the materials located around the room. We are especially interested in your comments on the topics listed below, but please give us your comments on any aspect of the permit regulations and eagle management objectives.

To submit your comments, you can drop off this form in the box by the main door, or mail it to:

Public Comments Processing
ATTN: FWS-R9-MB-2011-0094
Division of Policy and Directives Management
U.S. Fish and Wildlife Service
4401 N. Fairfax Drive, MS 2042-PDM
Arlington, VA 22203
(Please note that your comments are in regard to Eagle Management and Permitting.)

Or, you can submit comments electronically at www.regulations.gov. Enter "FWS-R9-MB-2011-0094-0491" in the search box.

To ensure consideration of written comments, they must be submitted on or before September 22, 2014.

Name: ____________________

Street Address: ____________________

City: ____________ State: ______ Zip Code: ______

Organization/Tribe You Represent: ____________________

Which Public Scoping meeting did you attend, if any? Location: ____________

E-mail: ____________________

If you do not want your name and address to be available to the public, check here [ ] (Be aware the Service cannot guarantee anonymity.)

Please write neatly so your comments can be recorded completely and accurately. Complete and drop this form in the box provided (or mail it to address on cover).

The following topics correspond to banners located around the room. The banners describe the issues and list some questions we'd like your input on. Please comment on any of these or anything else related to bald and golden eagle management, permits for nonpurposeful take of eagles, or permits for taking eagle nests.

1. Management Objectives:

2. Adaptive Management Process:

3. Compensatory Mitigation:

4. Programmatic Permit Conditions and Duration:

5. Cultural Resources and Values:

6. Permits for Taking Eagle Nests:

APPENDIX C: GOVERNMENT AGENCIES AND ORGANIZATIONS CONSULTED

United States – State Agencies

Alaska Energy Authority
Arizona Game and Fish Department
Atlantic Flyway Council
Delaware Division of Fish and Wildlife
Florida Fish and Wildlife Conservation Commission
Georgia Department of Natural Resources, Nongame Conservation Section
Oklahoma Department of Wildlife Conservation
Pacific Flyway Council
Washington Department of Transportation
Wyoming Game and Fish Department

United States – Local Agencies

City of Sanibel, Florida
Lee County Florida Board of County Commissioners

United States – Federal Agencies

US Department of Agriculture; APHIS Wildlife Services
US Department of Energy
US Environmental Protection Agency; Office of Federal Activities

Non-Governmental Organizations

American Bird Conservancy
American Eagle Foundation
American Falconry Conservancy
American Wind Energy Association
Animal Welfare Institute
Arizona Falconers Association
Audubon Missouri
Audubon Society of Greater Denver
Audubon, Sierra Club, Natural Resources Defense Council
Avian Power Line Interaction Committee
Backcountry Against Dumps
Bird Conservation Network
Concerned Citizens of Garden
Conservancy of Southwest Florida
Conservation Congress
Conservation Research Foundation

Cornell Raptor Program
Defenders of Wildlife
Delaware Otsego Audubon Society
Eastern Long Island Audubon Society
Energy and Wildlife Action Coalition
Friends of Blackwater
Friends of the Pocosin Lakes National Wildlife Refuge
Hawk Migration Association of North America
Hawkwatch International
International Association for Falconry and the Conservation of Birds of Prey
Kansas Hawking Club
Laudoun Wildlife Conservancy
Maryland Ornithological Society
Montana Falconers Association
National Congress of American Indians
National Wildlife Federation
New York State Ornithological Association, Inc.
North America Falconers Association
North America Platform Against Windpower
Northwest Arkansas Audubon Society
Oregon Falconers Association
Public Interest Coalition
Raptor Education Foundation
Roaring Fork Audubon Society
Rocky Mountain Bird Observatory
Rocky Mountain Chapter of the Sierra Club
Rocky Mountain Raptor Program
Texas Hawking Association
Wisconsin Falconers Association
World Council for Nature