Eskimo Curlew
(*Numenius borealis*)

5-Year Review:
Summary and Evaluation

U.S. Fish and Wildlife Service
Fairbanks Fish and Wildlife Field Office
Fairbanks, Alaska

August 31, 2011

I. GENERAL INFORMATION

The U.S. Fish and Wildlife Service (Service) is required by section 4(c)(2) of the Endangered Species Act of 1973 (ESA) to conduct a status review of each listed species at least once every 5 years. The purpose of a 5-year review is to evaluate whether or not the species' status has changed since it was listed (or since the most recent 5-year review). Based on the 5-year review, we recommend whether the species should be removed from the list of endangered and threatened species, changed in status from endangered to threatened, or changed in status from threatened to endangered. Our original listing of a species as endangered or threatened is based on the existence of threats attributable to one or more of the five threat factors described in section 4(a)(1) of the Act, and we must consider these same five factors in subsequent consideration of reclassification or delisting of a species. In the 5-year review, we consider the best available scientific and commercial data on the species, and focus on new information made available since the species was listed or last reviewed. If we recommend a change in listing status based on the results of the 5-year review, we must propose to do so through a separate rule-making process defined in the Act that includes public review and comment.

Contact Information:

Lead Regional or Headquarters Office: Sonja Jahrsdoerfer, Endangered Species Coordinator, Region 7, Alaska; (907) 786-3323.

Lead Field Office: Denise Walther, Ph.D., Fish and Wildlife Biologist, Fairbanks Fish and Wildlife Field Office, (907) 456-0277; and Ted Swem, Chief, Endangered Species Branch, Fairbanks Fish and Wildlife Field Office, (907) 456-0441.

Methodology used to complete the review:

This review was prepared by the Fairbanks Fish and Wildlife Field Office (FFWFO) in 2011. The Service solicited information on Eskimo curlew (*Numenius borealis*) through a Federal Register notice (June 22, 2011, 76 FR 36491). We received 4 responses to this notice; none of the responses provided new information about the species. We used information available in published and unpublished literature, discussions with other agency biologists, discussions with species experts, information available on the Internet, and FFWFO species files. There has been no previous 5-year review. This 5-year review contains a summary of available information on the species' biology and threats. The review synthesizes this information to evaluate the listing status of the species and provide an indication of its potential recovery. Finally, based on this synthesis and the threats identified in the five-factor analysis, we recommend conservation actions to be completed or initiated within the next 5 years.

Federal Register (FR) Notice Citation Announcing Initiation of this Review: A notice announcing initiation of the 5-year review of this species and the opening of a 60-day period to receive information from the public was published in the Federal Register on June 22, 2011 (76 FR 36491); we received 4 responses to this notice, which we have considered in preparing this 5-year review.

Listing History:

Original Listing
FR notice: 32 FR 4001
Date listed: March 11, 1967
Entity listed: Eskimo curlew (*Numenius borealis*)
Classification: Endangered under the Endangered Species Preservation Act of 1966
80 Stat. 926; 16 U.S.C. 668aa(c)

Associated Rulemakings
None

Review History: The Eskimo curlew was designated as an endangered species prior to enactment of the Endangered Species Act of 1973, as amended, under the Endangered Species Preservation Act of 1966. Accordingly, there was no formal listing package identifying threats to the species, as required by Section 4(a)(1). The Service funded a literature review and status report on the Eskimo curlew (Canevari and Blanco 1994, Blanco and Canevari 1995) in the 1990s that was not associated with the 5-year review process. The status of the species and the factors associated with its decline are also discussed in Parts I and II of the Service's Endangered Species Information System Workbook for the Eskimo curlew (Gill 1986).

Species' Recovery Priority Number at Start of 5-year Review: The recovery priority number for the Eskimo curlew is 5 according to the Service's 2010 Recovery Data Call, based on a 1–18 ranking system where 1 is the highest-ranked recovery priority and 18 is the lowest (Endangered and Threatened Species Listing and Recovery Priority Guidelines, 48 FR 43098, September 21, 1983). A value of 5 indicates that the Eskimo curlew is a species that faces a high degree of threat and has a low probability of recovery.

Recovery Plan or Outline: The Service has not developed a recovery plan for Eskimo curlew. In 1990, the Service's Eskimo Curlew Advisory Group reviewed all available information and data and concluded that the Service does not have enough information to initiate a formal recovery effort. The Advisory Group, including Service biologists from Regions 2, 6, and 7 and representatives from Canada, Argentina, and several conservation organizations, produced an outline for an Eskimo Curlew Conservation Strategy. In 1992, the Regional Director of the Alaska Region issued a memo confirming that the Service did not plan to prepare a recovery plan for this species.

Critical Habitat: The Service has not designated critical habitat for the Eskimo curlew.

II. REVIEW ANALYSIS

Information on the Species and its Status

Eskimo curlews historically nested in tundra in the Northwest Territories, presumably in adjacent Nunavut, and possibly in Alaska. After nesting, they moved to Labrador and eastern Canada to fatten on berries before migrating nonstop across the western Atlantic to South America, where they presumably wintered in the Pampas. In spring, Eskimo curlews moved north overland through the prairies of the United States and Canada before returning to the arctic to breed. The species originally numbered in at least the hundreds of thousands, but crashed during the late 1800s due to intensive hunting and impacts to important spring migration habitat in the prairies. Relevant habitat impacts likely included widescale conversion of grassland to agriculture, fire suppression, and the extinction of the Rocky Mountain grasshopper (*Melanoplus spretus*; Lockwood and DeBrey 1990), which historically was an extremely numerous and irruptive insect and an important food source for migrating curlews (see *A theory on the demise of the species* in Gill et al. 1998).

Because Eskimo curlews were not well studied before their decline, we have very limited information on their biology. A thorough review of existing information on Eskimo curlew life history, ecology, and historical distribution, and factors contributing to their decline was conducted by Gill et al. (1998). Gollop et al. (1986) also provides an extensive review of the species' life history and occurence since its decline. Online versions are available for both reviews (see Literature Cited). Virtually no additional information on the species has become available since Gill et al.'s (1998) review, although there were a handful of unconfirmed sightings in the 2000s. The Committee on the Status of Endangered Wildlife in Canada conducted a status assessment in 2009 (COSEWIC 2009), which resulted in retaining the Eskimo curlew's endangered listing status in Canada.

Taxomomy
The Eskimo curlew is a member of the family Scolopacidae (sandpipers) and tribe Numeniini (godwits and curlews). Eight curlew species comprise the genus *Numenius*, including the Eskimo curlew. Three other *Numenius* curlews occur in the Western hemisphere: the whimbrel (*Numenius phaeopus*), the bristle-thighed curlew (*Numenius tahitiensis*), and the long-billed curlew (*Numenius americanus*).

Habitat and Food
The only confirmed breeding areas for Eskimo curlew were identified as "barren grounds" in the Northwest Territories, Canada (Gollop et al. 1986). Primary foods on the breeding grounds were overwintered berries, particularly crowberries (*Empetrum nigrum*), and insects. Eskimo curlews may have used vegetated and unvegetated intertidal habitats in western and northwestern Alaska (Murdoch 1885, Nelson 1887; cited in Gill et al. 1998). Post-breeding, Eskimo curlews migrated eastward, foraging in heath-shrub habitats, and staged in large numbers along the coast of Labrador where they fed on berries in nearby uplands and invertebrates in intertidal habitats (Gill et al. 1998). Eskimo curlews wintered in the Pampas and possibly intertidal habitats of South America, feeding primarily on insects and presumably other invertebrates. During their

northward spring migration through the midwestern United States, Eskimo curlews preferred burned and disturbed prairie habitats and agricultural fields where they fed primarily on grasshopper egg cases and emerging nymphs (Gill et al. 1998). Localized irruptions of the now extinct Rocky Mountain grasshopper may have been a particularly important food resource for Eskimo curlews in these habitats (Gill et al. 1998).

Breeding

Most information available on breeding comes from the notes and specimens collected by naturalist Robert MacFarlane (Gollop et al. 1986) from 1862–1866. Spacing of nests observed by McFarlane does not suggest colonial nesting; however, given the estimated size of the population preceding their decline, Eskimo curlews may have nested at higher densities in other locations (Gill et al. 1998). Coloniality has been observed in other *Numenius* curlews (little curlew [*Numenius minutus*], Labutin et al. 1982; slender-billed curlew [*Numenius tenuirostris*], Gretton 1991 in Gill et al. 1998). Nests were simple depressions on bare ground, usually with four eggs. MacFarlane (in Gollop et al. 1986) described the nest as "a mere hole in the earth, lined with a few decayed leaves, and having a thin sprinkling of hay in the midst of them." Hatching likely occurred in late June and early July. MacFarlane (in Gollop et al. 1986) assumed that only females incubated, although males were noted near nests and broods. Gill et al. (1998) suggest that both parents probably incubated and brooded as in other Numeniini. The time to fledging is unknown.

Genetics

No information regarding the genetics of the Eskimo curlew is available.

Distribution and migration

The only confirmed breeding grounds for Eskimo curlew occurred at two sites in tundra in the Northwest Territories, Canada, but their breeding range probably extended through similar habitats elsewhere in the Northwest Territories and adjacent Nunavut and possibly westward into Alaska and eastern Russia. Eskimo curlews migrated annually between breeding grounds in North America and wintering grounds in South America. In late summer and fall, the majority of birds migrated eastward across Alaska and Canada and staged in large numbers along the coast of Labrador (Gill et al. 1998) before continuing south 4000–5000 km (2500–3000 mi) over the Atlantic Ocean to South America. They then migrated south to wintering grounds in the Pampas of Argentina, southern Brazil, Uruguay, and Chile. There is some evidence that Eskimo curlews also overwintered in southern Patagonia, possibly leaving the Pampas in mid-winter (Gill et al. 1998). Spring migration probably began in late February to March and continued through May. The northward migration route through South America is unknown. However, Eskimo curlews are thought to have passed through Central America and crossed the Gulf of Mexico into Texas. They travelled northward through the midwestern United States and northwestward through Canada, returning to the breeding grounds in late May.

Abundance and Trends

Eskimo curlews are thought to have once numbered in the hundreds of thousands (Gill et al. 1998). The population declined precipitously and approached extinction in the late 19th century. By 1900, sightings of Eskimo curlews were rare. The last record confirmed by physical evidence is a specimen collected in Barbados in 1963. Since that time, 39 potential sightings

have occurred in 22 different years (see Table 1 in COSEWIC 2009), most recently in Peggy's Cove, Nova Scotia in September 2006 (Hoffman 2007). The reliability of these sightings is variable and none have been confirmed by physical evidence. Only one of the sightings occurred within the historical wintering range of the species (October 1990, Laguna Mar Chiquita, Cordoba, Argentina; Michelutti, 1991 in Gill et al. 1998). Surveys of the Eskimo Curlew's historic and potential breeding areas (Gollop *et al.* 1986, J. Rausch, pers. comm. 2008 in COSEWIC 2009), including remote areas of Alaska (e.g. Whitman 2007); fall staging habitat (McCaffery 1991); wintering areas (Blanco et al. 1993); and spring migration stopovers (Eubanks and Collins 1992) over recent decades have not detected the species.

It is difficult to speculate on the potential extant population size of Eskimo curlews, but the rarity of potential sightings over the past several decades indicate very low numbers. COSEWIC (2009) concluded in their recent status review that "It is conceivable that the Eskimo Curlew still persists in very small numbers." Both the U.S. Shorebird Conservation Plan (Brown et al. 2001) and the Canadian Shorebird Conservation Plan (Donaldson et al. 2000) estimate the population size to be fewer than 50 individuals.

Does the Eskimo curlew remain extant?
Recent quantitative methods used to estimate the probability of existence of a number of species estimate the probability that Eskimo curlews were extant in 2009 is extremely low (Elphick et al. 2010; see also Roberts et al. 2010). Elphick et al. (2010) estimated a probability of 3×10^{-4} (0.0003) when only sightings supported by physical evidence were included in the analysis. Filling in gaps between confirmed sightings with those that were considered by expert opinion to be credible lowered the probability to 2×10^{-7} (Elphick et al. 2010). The two analyses estimated extinction dates of 1967 and 1965, respectively, with the upper bounds of 95% confidence intervals in 1977 and 1970. However, these analyses both used 1963 as the last uncontroversial record. Subsequent records were considered controversial because the authors could not identify a standard method used to evaluate these Eskimo curlew sightings (Roberts et al. 2010). Including controversial records in the analysis estimates an extinction date of 2008 with the upper bound of 95% confidence interval reaching 2013.

Butchart et al. (2006) categorized Eskimo curlews as potentially extinct using a qualitative framework based on five types of evidence for extinction and four types of evidence against extinction to assess confidence in extinction. According to Butchart et al. (2006), evidence supporting the hypothesis that Eskimo curlews are extinct included their well-documented recent decline and effects from severe threatening processes (habitat loss and intensive hunting), while evidence against extinction included inadequate surveys, unconfirmed reports (as late as 1990 in their analysis), and, possibly, suitable habitat remaining within the species' known range.

Five-factor Analysis

Section 4 of the Act established a rulemaking procedure that requires a five-factor analysis for determining whether to list a species as endangered or threatened. Because the Eskimo curlew was designated as an endangered species prior to enactment of the ESA, there was no formal listing package identifying threats to the species, as required by Section 4(a)(1). As such, there

was no initial, formal status review nor was a threats analysis conducted; there is no baseline accurately describing the status of Eskimo curlew at the time of or before listing.

The following analysis describes and evaluates the threats attributable to one or more of the five listing factors outlined in section 4(a)(1) of the Act.

FACTOR A: Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range

Human Development
Habitat within the Arctic breeding range remains largely undisturbed. Future mining and oil and gas development may occur within Arctic breeding habitat. However, potential impacts from these activities are difficult to assess because we have limited knowledge of specific breeding areas or habitat requirements.

Conversion of tallgrass prairie and eastern mixed-grass prairie to agriculture in the late 1800s probably contributed to the decline of Eskimo curlews. These habitats were important stopovers for the curlews on their northward spring migration. Remaining prairie ecosystems were also altered by fire suppression, reducing the amount of preferred disturbed prairie habitat available to curlews (Gill et al. 1998). Fire regimes can significantly affect the community structure and productivity of grasshoppers (Meyer et al. 2002, Evans 1984, 1988) in tallgrass prairie ecosystems through effects on plant communities. The limited availability of suitable habitat and key food resources in the midwestern states during the Eskimo curlews' spring migration may impede potential recovery of the species.

Widespread conversion of wintering habitat to agriculture in South America since the decline of the Eskimo curlew may also hinder recovery (Gill et al. 1998). However, a recent review of studies on migratory shorebird habitat in southern South America (Blanco et al. 2004) and analysis of satellite imagery in Brazil, Uruguay, and Argentina (Lanctot et al. 2004) indicate that potential habitat remains in the wintering range.

Climate Change
Global climate change is likely to result in ecosystem level effects on historical Eskimo curlew habitats, particularly in Arctic breeding grounds. For the last several decades, surface air temperatures in the Arctic have warmed at a rate that exceeds the global average and they are projected to continue on that path (IPCC 2007). Although we expect the altered hydrology and temperature regimes associated with climate change to affect the habitats in which Eskimo curlews breed, stage during migration, and winter, the limited information available on their biology makes it difficult to assess the potential vulnerability of the species to these changes.

Contaminants
The role of pesticides in the decline of the Eskimo curlew and their potential as a continued threat to the species is unknown. Gill et al. (1998) indicate that use of strychnine in the late 1800s may have affected curlews in the midwestern United States and suggest the examination of tissue from existing specimens may provide additional information on contaminant levels in Eskimo curlews.

FACTOR B: Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Commercial Purposes
Intensive market and sport hunting has been identified as a major contributing factor in the decline of the Eskimo curlew in the late 19th century (e.g., Banks 1977, Gill 1986, Gollop et al. 1986, Gill et al. 1998). However, regulatory protection of the Eskimo curlew and other migratory birds has eliminated market hunting as a current threat to the species in North America. Sport hunting of shorebirds still occurs in Barbados where the last Eskimo curlew specimen was shot in 1963 (Hutt 1991 in Blanco and Canevari 1995) and other countries in the Carribean (R. Lanctot, pers. com. 2011); subsistence hunting of shorebirds may still occur in Guyana (Blanco and Canevari 1995).

Recreational, Scientific, or Educational Purposes
Investigator disturbance
If an extant population of Eskimo curlews is found, efforts by researchers and naturalists to observe, photograph, or otherwise study the species may potentially disturb individual birds. The sensitivity of Eskimo curlews to disturbance is unknown. Such activities could potentially displace curlews from preferred habitat and have unknown physiological and reproductive consequences resulting from altered behavior patterns. Because the population of Eskimo curlews, if extant, is estimated to be in the tens of individuals, investigator disturbance within or near breeding habitat could result in population-level impacts to the species.

Sport hunting
See Commercial Purposes above.

FACTOR C: Disease or Predation
No information is available on susceptibility of Eskimo curlew to disease or predation. Neither factor has been implicated in its initial decline.

FACTOR D: Inadequacy of Existing Regulatory Mechanisms
Existing regulatory mechanisms provide protection for the Eskimo curlew throughout most of its range. The Eskimo curlew is currently protected in the United States under multiple Federal laws, including the ESA and the Migratory Bird Treaty Act. It is listed as endangered in Alaska, Kansas, Montana, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas, and as nongame species in several other states (Gill et al. 1998). In Canada, it is designated as an endangered species under the Species at Risk Act and also protected under the Migratory Birds Convention Act and provincial regulations in all provinces and territories. In North America, the Eskimo curlew is further protected by migratory bird conventions between Canada and the U.S. (Convention Between the United States and Great Britain (for Canada) for the Protection of Migratory Birds; 39 Stat. 1702; TS 628) and Mexico and the United States (Convention between the United States of America and the United Mexican States for the Protection of Migratory Birds and Game Mammals; 50 Stat. 1311; TS 912). The species is also covered under CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora, 27 U.S.T. 108) and the Western Hemisphere Convention (Convention on Nature Protection and Wildlife

Preservation in the Western Hemisphere; 56 Stat. 1354; TS 981). The Eskimo curlew is categorized as critically endangered (possibly extinct) on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species (IUCN 2011).

FACTOR E: Other Natural or Manmade Factors Affecting Its Continued Existence

Severe storms during transoceanic migration over the Atlantic in fall, or storms on the wintering grounds are potential threats (Gill et al. 1998). The susceptibility of the species to these storms is unknown.

III. RECOVERY CRITERIA

The Service has not established recovery criteria for the Eskimo curlew.

IV. SYNTHESIS

The Eskimo curlew was listed as endangered in 1967, several decades after its apparently precipitous decline in the 1870s and 1880s, and 4 years after the last physical evidence of their existence, a specimen collected in Barbados in 1963, was recorded. Since that time, there have been only 39 potential sightings, most recently in 2006. None of these sighting are supported by physical evidence, although some are considered potentially valid by species experts (e.g. Gollop 1997). Based on the rarity of recent potential sightings, the length of time that has passed since the last sighting confirmed by physical evidence, and analyses presented in recent published literature (Butchart et al. 2006, Elphick et al. 2010; Roberts et al. 2010), we believe the likelihood that the Eskimo curlew remains extant to be extremely low.

However, after reviewing the best available information associated with potential sightings and current threats to the species, as well as discussions with species experts, we are unable to conclude with reasonable certainty that the Eskimo curlew is extinct for the following reasons:

1. Several potential sightings within the past decade, while not confirmed by physical evidence, make it difficult to discount the possibility of an extant breeding population.

2. Although the general historical distribution of the Eskimo curlew is known, our knowledge of the specific areas used for breeding, migratory stopovers, and wintering is limited. Much effort has been devoted to surveying potential habitat (COSEWIC 2009); however, the extent of geographic coverage and intensity of these surveys may not have been adequate to detect a small population, particularly in the Eskimo curlew's remote Arctic breeding range.

3. The Eskimo curlew can be difficult to distinguish from other shorebirds, particularly juvenile whimbrels (*Numenius phaeopus*) and little curlews (*Numenius minutus*). While

similarities among species complicate confirmation of potential sightings, they also increase the potential that Eskimo curlews could go undetected.

In conclusion, our review of the status of the Eskimo curlew does not support a change in classification. We do not think it is advisable to declare the species extinct, and recommend that the Eskimo curlew retains its current listing status of endangered because it remains in danger of extinction throughout its range.

V. RESULTS

Recommended Listing Action:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist (*Indicate reasons for delisting per 50 CFR 424.11):*
____ *Extinction*
____ *Recovery*
____ *Original data for classification in error*
_X_ No change is needed

New Recovery Priority Number and Brief Rationale: The current number for the Eskimo curlew is 5. This recovery priority number reflects a species that faces a high degree of threat and a low recovery potential. We do not recommend a change in the current number because the species still meets the criteria for recovery number 5. If Eskimo curlews are found to be extant, current threats place their continued existence at great risk, and the presumably low numbers of Eskimo curlews and the vast area that comprises their breeding, migratory, and wintering habitats would make managing and accomplishing their recovery extremely challenging.

VI. RECOMMENDATIONS FOR FUTURE ACTIONS

Because we believe the likelihood that the Eskimo curlew remains extant to be extremely low, we do not recommend further conservation or management actions at this time. However, we acknowledge that efforts to conserve other shorebirds (e.g. Donaldson et al. 2000, Brown et al. 2001) with similar life history characteristics would help to address current threats to the Eskimo curlew and support their recovery if an extant population exists. If the continued existence of the Eskimo curlew is confirmed in the future, development and implementation of a recovery plan would be warranted.

VII. REFERENCES

Species experts and natural resources managers consulted

Brad Andres U. S. Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia.

Chris Elphick, Department of Ecology & Evolutionary Biology, University of Connecticut, Storrs, Connecticut.

Robert E. Gill, U.S. Geological Survey, Alaska Science Center, Anchorage, Alaska.

Cheir Gratto-Trevor. Canadian Wildlife Service, Science and Technology, Saskatoon, Saskatchewan.

Steve Kendall, U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge, Fairbanks, Alaska.

Richard Lanctot, U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Anchorage, Alaska.

Kim Titus, Alaska Department of Fish and Game, Nongame Program, Juneau, Alaska.

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U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Eskimo curlew*

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
__X__ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: 5

Review Conducted By: Denise Walther

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

Approve _____ Date 8/31/11

The lead Field Office must ensure that other offices within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. The lead field office should document this coordination in the agency record.

REGIONAL OFFICE APPROVAL:

The Regional Director or the Assistant Regional Director, if authority has been delegated to the Assistant Regional Director, must sign all 5-year reviews.

ACTING **Lead Regional Director, Fish and Wildlife Service**

Approve _____ Date 8/31/2011

The Lead Region must ensure that other regions within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. Written concurrence from other regions is required.

ACTING **Cooperating Regional Director, Fish and Wildlife Service**

__X__ Concur _____ Do Not Concur

Signature _____ Date 9/15/2011

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Eskimo curlew*

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
_X_ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: 5

Review Conducted By: Denise Walther

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

Approve _____ Date _____
The lead Field Office must ensure that other offices within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. The lead field office should document this coordination in the agency record.

REGIONAL OFFICE APPROVAL:

The Regional Director or the Assistant Regional Director, if authority has been delegated to the Assistant Regional Director, must sign all 5-year reviews.

Lead Regional Director, Fish and Wildlife Service

Approve _____ Date _____

The Lead Region must ensure that other regions within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. Written concurrence from other regions is required.

Cooperating Regional Director, Fish and Wildlife Service
for Assistant Regional Director, Ecological Services

_X_ Concur _____ Do Not Concur

Signature Elizabeth A. [illegible] Date 9/30/11

Cooperating Regional Office(s):
Southwest Region (2)
Concurrence signed by Elizabeth Oms, Acting Assistant Regional Director
Michelle Shaughnessy, Assistant Regional Director-Ecological Services, 505/248-6646
Susan Jacobsen, Chief of Endangered Species, 505/248-6641
Wendy Brown, Regional Recovery Coordinator, 505/248-6664

Mountain-Prairie Region (6)
Concurrence signed by Henry Maddux, Acting Regional Director
Mike Thabault, Assistant Regional Director-Ecological Services, 303/236-4210
Bridget Fahey, Chief of Endangered Species, 303/236-4258
Seth Willey, Regional Recovery Coordinator, 303/236-4257