

IV. ENVIRONMENTAL CONSEQUENCES

This section analyses and describes potential environmental impacts and consequences that could result from the implementation of an alternative strategy to control and manage resident Canada geese. Alternatives A, B, C, D, E, F, and G, identified in section **II.B. Principal Alternative Actions**, are analyzed. This chapter is organized by Alternative, with discussion of the consequences of each alternative on various impacted resource areas. Generally, many of the impacts discussed are common to more than one alternative, but vary in magnitude.

A. ALTERNATIVE A - NO ACTION

1. Biological Impacts

a. Resident Canada Goose Populations

The recent creation of a Special Canada goose permit, increasing the numbers of other permits issued authorizing control activities, and increasing the numbers of resident Canada geese taken by sport hunters in expanded hunting seasons have not appreciably slowed the population growth of resident Canada geese. Under the current resident Canada goose management/control system, resident Canada goose populations would likely continue to grow, at variable rates, until ultimately limited by available food, water, sanctuary, or other resource needs. Given the increasing urbanization of rural areas coupled with abundant food resources and the high survival and fecundity rates of these geese, populations likely will continue to increase during the foreseeable future. In addition, distribution of resident Canada goose problems and conflicts likely will expand within the conterminous United States due to increases in numbers, attendant population pressures for dispersal, and the availability of suitable habitat.

The current program has had little success in stabilizing the overall growth of resident Canada goose populations, although, in some areas, the rate of increase appears to have slowed in the past few years. In the Atlantic Flyway, the spring 2001 population was estimated at 1,011,300 geese, an average annual increase of 8 percent since 1991 (U.S. Fish and Wildlife Service 2001). This growth has occurred despite an average annual sport harvest of approximately 240,000 resident birds (1997-99), the reported take of over 60,000 eggs (1995-99), and the reported permit take of 7,840 adult geese (1995-99). Assuming a conservative future growth rate of 5 percent, we estimate that the spring population in the Atlantic Flyway will approach 1.3 million in 5 years and 1.6 million in 10 years.

In the Mississippi Flyway, the spring 2001 population was estimated at 1,371,100 geese, an average annual increase of 6 percent since 1993 (U.S. Fish and Wildlife Service 2001). This growth has occurred despite an average annual sport harvest of approximately 595,000 giant Canada geese (1996-99), the reported take of almost 40,000 eggs (1994-99), and the reported permit take of 13,729 adult geese (1994-99). Assuming a conservative future growth rate of 4 percent, we estimate that the spring population in the Mississippi Flyway will approach 1.7 million in 5 years and 2.0 million in 10 years.

In the Central Flyway, the spring 2001 index was 558,700 for that portion of the Western Prairie Population and Great Plains Population ranges in the May Breeding Habitat and Population Survey (BHPS). These estimates have increased an average of 12 percent annually since 1992 (U.S. Fish and Wildlife Service 2001). For the Hi-Line Population, the spring 2001 estimate was 252,000 in the BHPS.

This population has increased an average of 6 percent annually since 1992 (U.S. Fish and Wildlife Service 2001). In total, the spring 2001 estimate for these two populations was 810,700 birds in the BHPS, which includes part of prairie Canada. These increases have occurred despite an average annual sport harvest of over 422,000 large Canada geese in the States of the Central Flyway and 590,000 in the entire Central Flyway (1995-98). By 2010, the Central Flyway Council estimates that the Great Plains Population breeding in the U.S. will approach 767,000 birds (Gabig 2000). Likewise, they predict the Hi-Line Population will continue to grow approaching 177,000 breeding birds in the U.S. by 2010 (Gabig 2000). Assuming a conservative future growth rate of 5 percent for both populations, we estimate that the numbers in the BHPS will approach 1.26 million by 2010.

In the Pacific Flyway, the Rocky Mountain Population's spring 2001 estimate was 161,400 birds in the BHPS. This estimate has increased 7 percent annually during the last 10 years (U.S. Fish and Wildlife Service 2001). For Pacific Population geese, the breeding pair index was over 64,000 pairs in 1998 (U.S. Fish and Wildlife Service 2001). This index has been relatively stable over the past 20 years with the exception of growth in Montana, Washington, and Oregon (Subcommittee on the Pacific Population of Western Canada Geese 2000). This growth has occurred despite increases in harvest from approximately 155,000 in the late 1970s to over 300,000 in the mid 1990s (see section **III.B.1.b.(3)(d) Pacific Flyway**). Assuming a conservative future growth rate of 5 percent for both populations, we estimate that the populations will approach 450,000 by 2010.

Under the Current Program (No Action), the population of resident geese in most areas would be expected to continue to increase until they reach, or exceed, the carrying capacity of the environment. Biological carrying capacity is the land or habitat's limit for supporting healthy populations of wildlife without degradation to the animal's health or environment over an extended period of time (Decker and Purdy 1988). Based on known population growth curves, Savidge (1980) estimated that it was likely that almost all areas were well below their carrying capacity for Canada geese.

While Savidge's study is more than 20 years old, little has occurred over the past 20 years to contradict these results. Unlike arctic nesting geese, resident Canada geese inhabit temperate environments with relatively stable breeding habitat conditions, are very tolerant of human disturbance, and have shown the ability to utilize a wide range of habitats. Further, while breeding Canada geese are territorial by nature (Kossack 1950, Brackage 1965), resident Canada geese are willing to nest in close proximity to other goose pairs and densities as high as 100 nests per acre have been found on islands (Klopman 1958, Ewaschuk and Boag 1972, Zenner and LaGrange 1998). High nest densities are more indicative of colonial nesting geese, such as snow geese.

Normally, with higher densities of colonial nesting geese in breeding colonies, food supplies would eventually become depleted resulting in poor body condition of adults and slower development and/or starvation of goslings. The impacts of decreased food supplies would likely occur over an extended period of time, and include an increase in mortality of goslings and adults from malnutrition, physiological stress, parasites, disease and predation due to insufficient breeding and brood-rearing habitat. Survivors likely would continue to decline in body size, possibly affecting breeding propensity and success over their lifetimes (U.S. Department of the Interior 2001).

With resident Canada geese, although not classified as a colonial nesting bird, populations have continued to increase, both on a local and regional scale, and we have not seen any of the above-mentioned food supply related problems. Given the large amount of available urban and suburban

habitat and the continuing population expansion into the few remaining unoccupied rural habitats, we believe it likely resident Canada geese remain significantly below their carrying capacity.

In addition to food supply related problems with over population, we would expect habitat degradation to increase as well. At some future point, it is possible that density-dependent regulation of the population would occur. That is, it is possible that geese would so deplete their food resources that a population decline would begin. However, the timing, likelihood, and scale of a population decline of this nature is unpredictable.

b. Natural Resources

Under the “No Action” alternative, negative impacts to soil and water resources would continue and likely increase. With increasing numbers of geese, especially in urban and suburban areas, the potential to negatively affect water quality around beaches (recreational waters) and wetlands would increase because of the increasing amount of fecal droppings. Excessive grazing by Canada geese would likely increase erosion along shorelines of ponds and lakes, golf courses, yards, and parks negatively impacting water quality, and cause increased erosion and sedimentation. Additionally, wildlife habitats susceptible to damage, such as native wetlands and marshes (Haramis and Kearns 2000), would continue to be overgrazed by increasing numbers of resident Canada geese.

c. Other Wildlife Including Federally Protected Species

Under the “No Action” alternative, we would not expect any new effects on threatened or endangered (T & E) species since resident Canada goose management activities would continue under current practices, guidelines, and restrictions. Given that any goose damage management requiring the capture, relocation, or take of geese requires a Federal permit, permit conditions preclude any new adverse effects on T & E species. Presently, most permitted actions with geese occur during the summer molt which generally occurs in June and July or involve nest and egg destruction in the spring. These seasonal captures harvest only resident geese due to the absence of migratory Canada goose populations at this time of year. All capture and removal methods allow for positive identification of target species and there has been no impact observed on non-target, threatened, and endangered species. Further, potential effects on T & E species during migratory bird hunting seasons, including Canada goose seasons, are annually considered as part of the hunting regulation establishment process. See section **III.A.4. Other Wildlife Including Federally Protected Species** for a further discussion of current effects on T & E species.

Resident Canada goose damage to habitat intended for wintering and migrating waterfowl would continue and likely increase due to growing numbers of birds.

2. Sociological Impacts

a. Sport Hunting

Sport hunting would be largely unaffected under the “No Action” alternative, although with increasing resident goose populations, we would expect hunting opportunities to increase. Resident Canada goose populations in areas that are normally targeted for management/control activities under current management are generally those that provide little or no sport-hunting opportunities due to restricted access within urban/suburban areas where hunting is either precluded or severely restricted. Areas and

resident Canada goose populations already open to sport hunting would be expected to remain open, as special Canada goose season frameworks and guidelines would not change.

Despite the growing high harvest exhibited throughout the Flyways, wildlife agency population goals have been far surpassed in many States, and numbers of human/goose conflicts continue to increase. Given current frameworks and regulations, and increasing urbanization, it does not appear that currently available sport harvest can adequately control resident Canada goose populations.

(1) Regular Hunting Seasons

Given the expected continued growth in resident goose populations, hunting opportunities would likely continue to increase before gradually leveling off at some unknown point in the future. Under current management/control practices, resident Canada goose harvest has continued to significantly increase and expand. Since 1986, the nationwide harvest of resident Canada geese has increased from less than 10,000 geese to over 1.5 million in the late 1990s, with resident populations continuing to increase. To date, existing control efforts have not significantly impacted goose population growth on anything more than a local scale. All available evidence suggests that populations of locally-breeding Canada geese will continue to increase. Thus, the regular season sport harvest would likely continue to increase under this alternative, as any reduction in goose numbers due to current control activities likely would be offset by increasing resident goose populations.

(2) Special Hunting Seasons

Like regular hunting seasons, the expected continued population growth of resident geese would likely increase special hunting opportunities before gradually leveling off at some future time. Under current management/control practices, special season resident Canada goose harvest has continued to increase and harvest distribution expand. Special hunting seasons targeted at resident Canada geese have been significantly expanded over the last 15 years with little overall impact on resident populations. Currently, special early or late seasons are offered in all four Flyways, with 35 States participating.

b. Migratory Bird Permit Program

(1) Wildlife Services Program

Under the “No Action” alternative, because resident goose populations would be expected to increase, Wildlife Services workload would likely increase as complaints increase. Because Wildlife Services is a cooperatively funded, service-oriented program, Wildlife Services cooperates with private property owners and managers and with appropriate land and wildlife management agencies, as requested and appropriate, with the goal of effectively and efficiently resolving wildlife damage problems in compliance with federal, State, and local laws, regulations, policies, orders, and procedures. Wildlife Services would continue to provide technical assistance and recommendations for deterring geese, using non-lethal methods, and lethal control, to reduce damage. Direct damage management would continue to be provided by Wildlife Services if requested, funded, and the requested direct damage management was consistent with Wildlife Services recommendations, policy and federal and State laws. Increasing complaints would also likely translate into increased requests for equipment to deter geese by non-lethal means. The Wildlife Services program would continue to loan, sell, or otherwise distribute this equipment to the public.

Alternately, although the resident goose population and related damages would likely increase, the numbers of requests for assistance may not. Available data suggests that when Wildlife Services does not have the ability or resources to respond readily or effectively to requests for assistance, the number of calls for assistance does not reflect the extent of the need. Rather, complainants may perceive the lack of Wildlife Services' ability to deliver satisfactory results and don't bother complaining or act independently to handle the problem. After the program has the support and ability to respond adequately to requests for assistance (such as permits in place, funding, and personnel), the numbers of requests often increase.

(2) U.S. Fish and Wildlife Service Program

Under the "No Action" alternative, increasing populations of resident Canada geese would likely result in increases in complaints and goose/human conflicts. Thus, more complaints and requests for assistance would result in an increased workload (i.e., permit review and issuance) for the Service.

Currently, States that do not participate in the special Canada goose permit program must continue to respond to individual resident Canada goose problems within their respective jurisdictions. Service administration responsibilities for each individual control activity currently necessitates the determination and/or issuance of a permit. Under this alternative, these determinations would be expected to increase. The Service, in most instances outside the special Canada goose permit, must decide on a case-by-case basis whether a permit should be issued. This process would continue.

(3) State Programs

Under the "No Action" alternative, increasing populations of resident Canada geese would likely result in increases in constituent complaints and goose/human conflicts. More complaints and more conflicts would likely translate to an increased workload (i.e., requests for technical assistance, permit recommendations, assistance funds, etc.) for the States.

Currently, States that do not participate in the special Canada goose permit program must either request a permit for each management activity related to resident Canada goose problems or refer complainants to Wildlife Services. Under this alternative, since requests for assistance would be expected to increase, we expect that additional States would request special Canada goose permits to handle the anticipated increased workload. These State requests would occur despite the fact that many States do not consider the special Canada goose permit program the best available method (both administratively and economically) for dealing with resident Canada goose conflicts (public scoping comments). Additionally, we believe those States that currently have a resident Canada goose damage management program would need additional funding and/or staffing to provide for increases in requests for technical assistance. For example, the South Dakota Department of Game, Fish, and Parks expended over 4,690 man-hours and \$183,000 in equipment and supplies in 1999 to combat resident Canada goose damage. Other States without a resident Canada goose damage management program would likely look for available funding sources to start one.

c. Social Values and Considerations

(1) Aesthetics

Nearly everyone finds some pleasure in viewing wildlife. While some people might measure the aesthetic value of geese simply by their numbers (i.e., more geese = more beauty), other people might find large numbers of geese to be aesthetically displeasing (i.e., more geese = less beauty) because of the problems they cause. Coluccy et al. (2001) found that most (68 percent) central Missouri residents enjoyed Canada geese and 42 percent were satisfied with the current population level in the area. However, landowners and those reporting property damage indicated that they would like to see fewer geese and were more likely to describe geese as a nuisance.

Under the “No Action” alternative, the resident goose population would be expected to increase, providing more public viewing opportunities, and a probable divergence on the aesthetic value of geese, as seen by the public. However, aesthetic problems associated with large numbers of geese, i.e., droppings, feathers, etc. would likely also increase.

Resource owners would likely strongly oppose this management alternative since they would bear the aesthetic damage caused by Canada geese. There would likely be high levels of frustration because additional assistance would not be provided. Negative perceptions of geese would likely increase and the aesthetic value of geese would likely diminish as more people become affected by damage at work, home, and recreational areas. As observations of geese become more commonplace, the aesthetic value would likely decline or be taken for granted.

(2) Recreational Use of Impacted Areas

As goose populations continue to increase, recreational areas would be impacted more frequently and more severely, especially those located in urban and suburban environments. People would likely be less willing to use recreational areas frequented by large numbers of geese because of the perceived increase in disease threats and the accumulation of goose feces and feather litter. Additional parks and recreational areas, such as athletic fields, would likely be impacted as goose populations and distribution increase.

(3) Animal Rights and Humaneness

Use of lethal control techniques under this alternative would continue. Such lethal control would continue to be viewed negatively by those groups and/or individuals advocating animal protection and some outside the directly-affected problem area(s). However, these groups would be expected to oppose most control measures and/or management actions. Under this alternative, geese would continue to be captured or killed under current guidelines for humane handling of wildlife.

d. Economic Considerations

(1) Residential, Commercial, and Public Property

Under this alternative, impacts to private and public property are expected to continue to grow. In recent years, damage complaints about resident Canada geese have continued to increase despite current control and management activities. Complaints to Wildlife Services and the Service have significantly increased in the last 10 years. With an expected increase in numbers of resident Canada geese and the relative availability of suitable habitat, the number of damage complaints is expected to continue to rise. In particular, damage complaints related to fecal droppings and turf damage in urban and suburban areas,

such as parks, public swimming beaches, golf courses, schools, athletic facilities, cemeteries, corporate business areas, and college campuses are all expected to increase with increasing numbers of birds. Conflicts with humans likely will become more pronounced as resident Canada goose numbers increase and areas impacted become more numerous.

(2) Agricultural Crops

Impacts to agricultural crops would be expected to continue under the “No Action” alternative. Agricultural losses to small grain, peanut, corn, livestock, and forage (hay) producers would continue to increase. Over the past 10 years, damage complaints regarding resident Canada geese have continued to increase despite increased hunting and current control and management activities. In particular, damage complaints related to late spring and summer crop depredation are expected to increase with increasing numbers of birds.

e. Human Safety

Increasing numbers of geese will increase risks to human safety. Larger goose populations mean an increased risk of goose - aircraft strikes to commercial and military aviation and a likely greater incidence of aggressive encounters of geese on humans.

Threats to aviation and waterfowl-aircraft strikes would be expected to increase with increasing goose populations, in particular those in urban and suburban areas. Anxiety among civil aviation pilots, airports, and passengers would also likely increase as these geese become more numerous and visible. Anxiety among military pilots would most likely be highest because of the recent crash and deaths caused by Canada geese.

Attacks on humans by Canada geese would likely increase because of continued growth of geese in urban and suburban habitats.

f. Human Health

While there is considerable debate over the health threat from resident Canada geese, the threat, of disease to humans from contact with goose fecal material would be expected to increase with increased goose population.

g. Costs of Management Program

(1) Administrative Costs

As discussed in section **III.B.1.c.(1) Wildlife Services Program** and **III.B.6.a. Administrative Costs**, Wildlife Services likely does not have sufficient personnel and resources to respond to all requests for assistance. Additionally, the Service’s budget for the migratory bird permit program has not kept pace with the rising costs of permit issuance and administration. Typically, the budget allocation falls far below the actual costs for administering program activities. These shortfalls must be subsidized by monies from other program areas. As the number of complaints continues to increase, greater demand likely will be placed on the States to assist in resident Canada goose damage management programs, on the Service to issue permits, on Wildlife Services for technical and in-field assistance, and exacerbate

ongoing funding problems.

Thus, under the “No Action” alternative, with a continuing increase in the numbers of resident Canada geese, the Service will continue to see increases in administrative costs due to likely increases in the requests for, and the issuance of, permits to control resident geese. Likewise, Wildlife Service would also continue to see costs increase as complaints continue to increase.

(2) Monitoring Costs

Monitoring cost would continue as they currently exists. No new costs would be expected. See section **III.B.6.b. Monitoring Costs** for further discussion of current costs.

(3) Other Costs

Costs associated with abating damage from resident Canada geese would be expected to increase with increasing populations of resident Canada geese, especially those borne by landowners experiencing goose conflicts and damage. See section **III.B.6.c. Other Costs** for further discussion of current costs.

B. ALTERNATIVE B - NONLETHAL CONTROL AND MANAGEMENT (Non-permitted activities)

1. Biological Impacts

a. Resident Canada Goose Populations

Under this alternative, take of resident Canada geese, except that occurring in regular hunting seasons, would cease. Given the increasing urbanization of rural areas, abundant food resources, the high survival and fecundity rates of these geese, and the lack of permitted take and special hunting seasons, population growth and distribution expansion would be significantly more pronounced than that under the “No Action” alternative (see section **IV.A.1.a. Resident Canada goose populations**) and would likely continue longer into the foreseeable future. Some areas would see rapid expansion and growth of populations. Without the special seasons annual sport harvest of approximately 520,000 geese in the four Flyways, populations of resident geese in most areas would increase rapidly until they reach the carrying capacity of the environment.

b. Natural Resources

Negative impacts to soil and water resources would continue and increase over those identified under the “No Action” alternative. With significantly more geese, the potential to negatively affect water quality around beaches and wetlands would increase because of the significant increase in the amount of fecal droppings. Additionally, excessive grazing by large numbers of Canada geese would increase erosion along shorelines of ponds and lakes, golf courses, yards, and parks negatively impacting water quality.

c. Other Wildlife Including Federally Protected Species

We would not expect any direct effects on T & E species since “Alternative B” would preclude all

currently permitted management practices and activities that might directly result in the take of geese outside of regular migratory bird hunting seasons. Habitat management and manipulation could, however, indirectly affect some species by the alteration of their habitat to make it less attractive to, or totally exclude, Canada geese.

As for other wildlife, since all permitted actions on geese would be eliminated, impacts of resident Canada geese on other migratory waterfowl would continue and increase more rapidly than under “Alternative A”. Resident Canada goose damage to habitat intended for wintering and migrating waterfowl would increase due to growing numbers of birds. Additionally, management of wildlife areas to reduce the suitability for resident Canada geese could reduce habitat for migrant populations of waterfowl.

2. Sociological Impacts

a. Sport Hunting

Sport hunting would be widely affected under “Alternative B”, although with increasing resident goose populations, we would expect regular season hunting opportunities in some areas to correspondingly increase. While resident Canada goose populations in areas that are normally targeted for management/control activities under current management are generally those that provide little or no sport-hunting opportunities (due to restricted access within urban/suburban areas where hunting is either precluded or severely restricted) would no longer be subject to permitted management or control activities resulting in take, some of these birds would likely disperse into hunting areas. Areas and resident Canada goose populations already open to sport hunting would be expected to remain open. However, regular Canada goose season frameworks and guidelines would likely become more liberal in an attempt to reduce the numbers of resident Canada geese.

(1) Regular Hunting Seasons

Given expected widespread increases in resident goose populations under this alternative, regular hunting season opportunities would continue to increase before eventually leveling off at some unknown point in the future. Some areas, particularly those near urban and suburban areas where past control actions would no longer be utilized, would likely see rapid growth in the number of geese available to hunting. More pronounced than that seen under current management/control practices (“No Action” alternative), resident Canada goose harvest under “Alternative B” would continue to significantly increase and expand as populations grow. Thus, the regular season sport harvest of resident Canada geese would likely increase under this alternative and become more liberal, although some are already at Treaty limits.

(2) Special Hunting Seasons

Under “Alternative B”, all special seasons, associated hunting opportunities, and the annual sport harvest of approximately 520,000 geese in the Flyways, would be eliminated. Currently, special early or late seasons are offered in all four Flyways, with 35 States participating.

b. Migratory Bird Permit Program

Under “Alternative B”, there would be significant changes in the migratory bird program of both the

Service and Wildlife Services as the programs shift from issuing permits to control and manage goose/human conflicts (in the case of the Service) and providing direct management activities (in the case of Wildlife Services) to providing only technical assistance.

(1) Wildlife Services Program

Under this alternative, Wildlife Services workload, especially technical assistance, would likely significantly increase as complaints increase with rapidly increasing populations. Wildlife Services would continue to provide technical assistance and recommendations for non-lethal resident Canada goose damage management. Non-lethal direct damage management would continue to be provided by Wildlife Services if requested, funded, and the requested direct damage management was consistent with Wildlife Services policy and federal and State laws. Increasing complaints would also likely translate into increased requests for equipment to deter geese by non-lethal means. The Wildlife Services program would likely have to expand these programs to meet increased demand. Wildlife Services would not intentionally kill any Canada geese because no lethal methods would be allowed.

(2) U.S. Fish and Wildlife Service Program

Under “Alternative B”, significantly increased populations of resident Canada geese would likely result in significant increases in complaints and goose/human conflicts. While the Service’s workload related to permits would significantly decrease (since no permits would be issued), the workload related to technical assistance would increase dramatically.

(3) State Programs

Under “Alternative B”, significantly increased populations of resident Canada geese would likely result in significant increases in complaints and goose/human conflicts. While the States’ workload related to permits requests and permit reports would significantly decrease (since no Federal permits would be issued), the workload related to technical assistance would increase dramatically. States participating in the special Canada goose permit program would have to cease all previously permitted management activities related to resident Canada goose problems. Those States that currently have a resident Canada goose damage management program would need additional funding and/or staffing to provide for increases in requests for technical assistance. Other States without a resident Canada goose damage management program would likely look for available funding sources to start one.

c. Social Values and Considerations

(1) Aesthetics

Under “Alternative B”, the resident goose population would be expected to rapidly increase compared to the “No Action” alternative. While this increase would provide more public viewing opportunities, it would also likely result in a probable divergence on the aesthetic value of geese, as seen by the public. Some individuals or groups would consider a large increase in the resident goose population aesthetically pleasing. Others experiencing goose damage would most likely find the change aesthetically displeasing. The negative aesthetic problems associated with large numbers of geese, i.e., droppings, feathers, etc. would also significantly increase. Resource owners would bear the aesthetic damage caused by Canada geese. See section **IV.A.2.c.(1) Aesthetics**.

(2) Recreational Use of Impacted Areas

Since goose populations would continue to rapidly increase, recreational areas would continue to be impacted, especially those located in urban and suburban environments. Additional parks and recreational areas, such as athletic fields, would likely be impacted as goose populations and goose distribution expand.

(3) Animal Rights and Humaneness

No lethal control, including egg addling, would be allowed under this alternative. However, given the likely higher frustration levels among affected resource and property owners, there would be increased concern among all parties, including affected resource owners, if other parties or people took independent illegal action to capture, harass, or kill problem Canada geese. For example, in June of 2001, several resident Canada geese were decapitated and placed on the doorstep of an outspoken animal protectionist in suburban Maryland (The Washington Times, 2001).

d. Economic Considerations

(1) Residential, Commercial, and Public Property

Under this alternative, impacts to private and public property would be expected to increase more rapidly than under any other alternatives. In the absence of any permitted resident goose management, damage complaints related to fecal droppings and turf damage in urban and suburban areas, such as parks, public swimming beaches, golf courses, schools, athletic facilities, cemeteries, corporate business areas, and college campuses would all be expected to significantly increase with rapidly increasing numbers of geese. Conflicts with humans would likely become more pronounced than the current situation (“No Action” alternative).

(2) Agricultural Crops

Impacts to agricultural crops would be expected to continue and rapidly increase under “Alternative B”. Agricultural losses to small grain, peanut, corn, livestock, and forage (hay) producers would likely significantly increase. In those areas where regular season hunting is limited by regulation or where special seasons were eliminated, such as rural areas, populations will increase at a greater rate than urban areas since rural populations were likely being reduced to some extent by special seasons. We would expect the increased numbers of geese in more rural areas to exacerbate existing agricultural conflicts.

e. Human Safety

Significantly more geese would negatively impact human safety issues. A larger goose population translates to an increased risk of goose - aircraft strikes to commercial and military aviation and a greater incidence of attacks on children. See section **IV.A.2.e. Human Safety**.

f. Human Health

The threat of disease transmission to humans from contact with goose fecal material would be expected to significantly increase since the quantity of fecal material correspondingly would likely significantly

increase with rapid population increases. See section **IV.A.2.f. Human Health**.

g. Costs of Management Program

(1) Administrative Costs

Under this alternative, resident goose populations would be expected to significantly increase and would likely result in significant increases in complaints and goose/human conflicts. Thus, more complaints and conflicts would likely result in an increased requests for assistance and complaints, and greater demand likely will be placed on Wildlife Services for technical and in-field assistance.

As discussed in section **IV.B.2.b.(1) Wildlife Services Program**, under this alternative, Wildlife Services would continue to provide technical assistance and recommendations for non-lethal resident Canada goose damage management by deterring geese using non-lethal methods to reduce damage. Workload related to technical assistance would increase significantly and dramatically. Significant increase in Wildlife Service's technical assistance budget would be necessary. For example, Ohio estimates that the average landowner spent \$350 annually trying to keep resident geese off their property, while the South Dakota Department of Game, Fish, and Parks expended over 4,690 man-hours and \$183,000 in equipment and supplies in 1999 to combat resident Canada goose damage. Nationwide, we conservatively expect costs to be in excess of 164,000 man-hours and \$6.4 million in equipment and supplies (based on providing services in 35 States) just to cover agricultural depredation expenses.

The Service's workload related to permits would significantly decrease since no permits would be issued.

(2) Monitoring Costs

Monitoring costs would generally continue as they currently exist and no new costs would be expected. However, since no permits would be issued under this alternative and special seasons would be eliminated, there would be little State incentive to closely monitor resident Canada goose population status. Thus, some States would likely abolish, or significantly reduce, population monitoring surveys from current levels. See section **III.B.6.b. Monitoring Costs** for further discussion of current costs.

(3) Other Costs

Costs associated with abating damage from resident Canada geese would be expected to increase with increasing populations of resident Canada geese. Landowners would likely request some sort of financial assistance to defray damage management costs. See section **III.B.6.c. Other Costs** for further discussion of current costs.

C. ALTERNATIVE C - NONLETHAL CONTROL AND MANAGEMENT (Permitted activities)

1. Biological Impacts

a. Resident Canada Goose Populations

Under this alternative, all permitted take of resident Canada geese, except that occurring on nests and

eggs, would cease. As such, given the previously identified factors affecting growth of these populations (increasing urbanization, abundant food resources, high survival and fecundity rates), and the lack of permitted take, population growth and distribution expansion would be more pronounced than that under the “No Action” alternative (see section **IV.A.1.a. Resident Canada goose populations**), but likely less pronounced than that predicted under “Alternative B” (see section **IV.B.1.a. Resident Canada Goose Populations**). Some areas not conducive to nest and egg destruction management (i.e., dispersed nesting areas, large areas, or thick cover) would see expansion of populations.

In those areas subject to intensive nest and egg removal methods, some temporary localized relief from brood concentrations could take place. However, we estimate the overall effect on populations would be limited. Nest manipulations are labor intensive, do little to reduce the overall population size, require repeated annual treatments, and are not favored by the general public (Coluccy et al. 2001; Smith et al. 1999). To equal the effect of removing an adult bird from a population, all eggs produced by that goose during its entire lifetime must be removed (Smith et al. 1999). Furthermore, egg removal efforts must be nearly complete in order to prevent recruitment from a small number of surviving nests that would offset control efforts (Smith et al. 1999).

Available resident Canada goose modeling recently completed in Missouri (Coluccy 2000; Coluccy and Graber, 2000), when extrapolated to the entire Mississippi Flyway, indicates that to maintain a stable population of resident Canada geese would require the removal of an additional 242,000 nests per year over that which is already taking place in the Flyway. To reduce the Mississippi Flyway’s resident population from the current 1,335,683 geese to the Flyway Council’s goal of 989,000 geese would require a Flyway-wide nest removal of 264,000 nests annually for 10 years. Nest removal numbers in the Atlantic Flyway, where the resident Canada goose population is even further above established Flyway goals, would be even greater.

Although regular and special season sport harvest would continue under “Alternative C”, and take of nests and eggs would be allowed and encouraged, populations of resident geese would likely continue to increase until they reach the carrying capacity of the environment. Further, even if complete egg removal could be achieved at a site, the large number of adult birds remaining in the population would continue to create conflicts and degrade habitats.

b. Natural Resources

Similar to that discussed in section **IV.B.1.b. Natural Resources** as some resident goose populations would remain stable while others increase.

c. Other Wildlife Including Federally Protected Species

Similar to that discussed in section **IV.B.1.c. Other Wildlife Including Federally Protected Species**.

2. Sociological Impacts

a. Sport Hunting

(1) Regular Hunting Seasons

See section **IV.B.2.a.(1) Regular Hunting Seasons.**

(2) Special Hunting Seasons

See section **IV.A.2.a.(2) Special Hunting Seasons.**

b. Migratory Bird Permit Program

(1) Wildlife Services Program

See section **IV.B.2.b.(1) Wildlife Services Program.**

(2) U.S. Fish and Wildlife Service Program

Similar to that discussed in section **IV.B.2.b.(2) U.S. Fish and Wildlife Service Program** as most permit issuance would be eliminated.

(3) State Programs

Similar to that discussed in section **IV.B.2.b.(3) State Programs** as most Federal permit issuance would be eliminated.

c. Social Values and Considerations

(1) Aesthetics

See section **IV.B.2.c.(1) Aesthetics.**

(2) Recreational Use of Impacted Areas

See section **IV.B.2.c.(2) Recreational Use of Impacted Areas.**

(3) Animal Rights and Humaneness

Similar to that discussed in section **IV.B.2.c.(3) Animal Rights and Humaneness** as there would be significantly less permitted impacts than the current program (“No Action”) on adult birds. However, nest and egg destruction activities would increase significantly.

d. Economic Considerations

(1) Residential, Commercial, and Public Property

See section **IV.B.2.d.(1) Residential, Commercial, and Public Property.**

(2) Agricultural Crops

See section **IV.B.2.d.(2) Agricultural Crops.**

e. Human Safety

See section **IV.B.2.e. Human Safety.**

f. Human Health

See section **IV.B.2.f. Human Health.**

g. Costs of Management Program

(1) Administrative Costs

Costs similar to those discussed in section **IV.B.2.g.(1) Administrative Costs.**

(2) Monitoring Costs

No new costs. See section **IV.A.2.g.(2) Monitoring Costs.**

(3) Other Costs

Similar to that discussed in section **IV.B.2.g.(1) Other Costs.** In addition, Cooper and Keefe (1997) estimated that removal costs in Minnesota are \$6.38 per egg. Using the Minnesota egg removal cost estimate for the entire Mississippi Flyway translates to (264,000 nests X 6.0 eggs per nest X \$6.38 per egg) \$10.1 million per year to induce population decline in the Flyway. Expanding this program over the necessary 10 year time period (see section **IV.C.1.a. Resident Canada Goose Populations**) to all Flyways would result in hundreds of millions of dollars in expenditures.

D. ALTERNATIVE D - INCREASED HUNTING

1. Biological Impacts

a. Resident Canada Goose Populations

Under the “Increased Hunting” alternative, population growth and distribution would be less pronounced than that under the “No Action” alternative (see section **IV.A.1.a. Resident Canada goose populations**). However, in urban and suburban areas not open to hunting seasons (and where the majority of goose/human conflicts occur), resident populations would likely continue increasing until ultimately limited by available food, water, sanctuary, or other resource needs. Areas not conducive to hunting would see continued expansion and growth, albeit at a lower rate than under the “No Action” alternative,

of resident goose populations until they reach the carrying capacity of the their environment.

In those areas open to expanded hunting methods, some localized population reductions could take place. However, we estimate the overall effect would be limited. Available information on the use of additional hunting methods, such as electronic calls, unplugged shotguns, and expanded shooting hours, during the special light goose seasons indicate that harvest increased approximately 50 - 69 percent (U.S. Fish and Wildlife Service, 2001b). However, this increase was attributable in large part to the Light Goose Conservation Order which authorized additional days of hunting outside the regular hunting season frameworks (September 1 - March 10). A more conservative estimate of the percentage increase in harvest attributable to the use of additional hunting methods within the hunting season frameworks would be 25 percent. Given a total special season harvest of approximately 520,000 geese, a 25 percent increase in special season harvest would only result in the harvest of an additional 130,000 Canada geese each year. A 50 percent increase in special season harvest would result in an additional 260,000 geese annually.

Current resident Canada goose modeling recently completed in Missouri (Coluccy 2000; Coluccy and Graber, 2000), when extrapolated to the entire Mississippi Flyway, indicates that to maintain a stable population of resident Canada geese would require the harvest of an additional 200,000 geese per year over that already occurring. To reduce the Mississippi Flyway's resident population from the current 1,335,683 geese to the Flyway Council's goal of 989,000 geese would require an additional harvest of 240,000 geese annually for 10 years. Harvest numbers in the Atlantic Flyway, where the resident Canada goose population is even further above established Flyway goals, would be even greater. Thus, to maintain a stable population in the Atlantic and Mississippi Flyways, an additional annual harvest in excess of 400,000 resident Canada geese would be required in these two Flyways alone.

b. Natural Resources

See section **IV.A.1.b. Natural Resources**.

c. Other Wildlife Including Federally Protected Species

Since expanded hunting methods within the Treaty frameworks would be the only additionally authorized management tool from those currently allowed, we would not expect any new effects on T & E species. Potential effects on T & E species during migratory bird hunting seasons, including Canada goose seasons, are annually considered as part of the hunting regulation establishment process. See section **III.A.4. Other Wildlife Including Federally Protected Species** for a further discussion of current effects on T & E species.

Most other resident Canada goose management would continue under current practices and conditions. Given that any goose damage management requiring the capture, relocation, or take of geese would continue to require a Federal permit, conditions in the permit would preclude any new adverse effects on T & E species. See section **IV.A.1.c. Other Wildlife Including Federally Protected Species** for further discussion.

2. Sociological Impacts

a. Sport Hunting

The general public has traditionally accepted hunting as a viable management alternative for controlling most wildlife populations. In central Missouri, Coluccy et al. (2001) found that traditional firearms hunting was generally viewed favorably (and actually received the highest approval) among respondents presented with various lethal and non-lethal resident goose management alternatives.

(1) Regular Hunting Seasons

See section **IV.A.2.a.(1) Regular Hunting Seasons**.

(2) Special Hunting Seasons

Under the “Increased Hunting” alternative, special season resident Canada goose hunting opportunities would increase. This alternative would provide new regulatory options to State wildlife management agencies to potentially increase the harvest of resident Canada geese above that which results from existing special Canada goose seasons that target resident Canada geese. This approach would authorize the use of additional hunting methods such as electronic calls, unplugged shotguns, and expanded shooting hours (one-half hour after sunset). During existing, operational, special September Canada goose seasons (i.e., September 1-15), these additional hunting methods would be available for use on an operational basis. Utilization of these additional hunting methods during any new special seasons or other existing, operational special seasons (i.e., September 15 -30) would be experimental and require demonstration of a minimal impact to migrant Canada goose populations. These experimental seasons would be authorized on a case-by-case basis through the normal migratory bird hunting regulatory process.

All expanded hunting methods and opportunities would be in accordance with the existing Migratory Bird Treaty frameworks for sport hunting seasons (i.e, 107 day limit from September 1 to March 10) and would be conducted outside of any other open waterfowl season (i.e., when all other waterfowl and crane seasons were closed).

Available information from the use of additional hunting methods, such as electronic calls, unplugged shotguns, and expanded shooting hours, during the special light goose seasons indicate that total harvest increased approximately 50 - 69 percent (U.S. Fish and Wildlife Service, 2001b). On specific days when light goose special regulations were in effect, the mean light goose harvest increased 244 percent (U.S. Fish and Wildlife Service, 2001b). However, this increase was attributable in large part to the Light Goose Conservation Order which authorized additional days of hunting outside the regular hunting season frameworks (September 1 - March 10). Olsen and Afton (2000) found that lesser snow goose flocks were 5.0 times more likely to fly within gun range (≤ 50 meters) in response to electronic calls than to traditional calls and the mean number of snow geese killed per hour per hunter averaged 9.1 times greater for electronic calls than for traditional calls.

We believe a more conservative estimate of the percentage increase in harvest attributable to the use of additional hunting methods within the hunting season frameworks would be 25 percent. Given a total special season harvest of approximately 520,000 geese, a 25 percent increase in special season harvest

would only result in the harvest of an additional 130,000 Canada geese each year. A 50 percent increase in special season harvest would result in an additional 260,000 geese annually. Neither of these estimates would solely achieve the desired population stabilization or reduction (see section **IV.D.1.a. Resident Canada goose populations**).

b. Migratory Bird Permit Program

(1) Wildlife Services Program

Similar, but overall less pronounced, to that discussed under the “No Action” alternative in section **IV.A.2.b.(1) Wildlife Services Program**, especially in those urban and suburban areas not open to increased hunting.

(2) U.S. Fish and Wildlife Service Program

Similar, but overall less pronounced, to that discussed under the “No Action” alternative in section **IV.A.2.b.(2) U.S. Fish and Wildlife Service Program**, especially in those urban and suburban areas not open to increased hunting.

(3) State Programs

Similar, but overall less pronounced, to that discussed under the “No Action” alternative in section **IV.A.2.b.(3) State Program**, especially in those urban and suburban areas not open to increased hunting. Areas open to increased hunting would likely see fewer requests for technical assistance and management activities.

c. Social Values and Considerations

(1) Aesthetics

Similar, but overall less pronounced, to that discussed under the “No Action” alternative in section **IV.A.2.c.(1) Aesthetics**, especially in those urban and suburban areas not open to increased hunting.

(2) Recreational Use of Impacted Areas

Similar, but overall less pronounced, to that discussed under the “No Action” alternative in section **IV.A.2.c.(2) Recreational Use of Impacted Areas**, especially in those urban and suburban areas not open to increased hunting.

(3) Animal Rights and Humaneness

See section **IV.A.2.c.(3) Animal Rights and Humaneness**.

d. Economic Considerations

(1) Residential, Commercial, and Public Property

See section **IV.A.2.d.(1) Residential, Commercial, and Public Property.**

(2) Agricultural Crops

Similar, but significantly less pronounced, to that discussed under the “No Action” alternative in section **IV.A.2.d.(2) Agricultural Crops**, as most agricultural areas would be open to increased hunting.

e. Human Safety

See section **IV.A.2.e. Human Safety.**

f. Human Health

See section **IV.A.2.f. Human Health.**

g. Costs of Management Program

(1) Administrative Costs

Similar to that discussed in section **IV.A.2.g.(1) Administrative Costs.**

(2) Monitoring Costs

No new costs. See section **IV.A.2.g.(2) Monitoring Costs.**

(3) Other Costs

Similar to that discussed under “Alternative B” in section **IV.B.2.g.(3) Other Costs.**

E. ALTERNATIVE E - INTEGRATED DEPREDATION ORDER MANAGEMENT

Under this alternative, any one or all of the four strategies, the Airport Depredation Order, the Nest and Egg Depredation Order, the Agricultural Depredation Order, and the Public Health Depredation Order, could be implemented by the State. The Orders would be for resident Canada goose populations only and, as such, in order to ensure protection of migrant Canada goose populations, could only be implemented between April 1 and August 31, except for the Nest and Egg Depredation Order which would allow the additional take of nests and eggs in March.. In addition to these specific strategies, we would continue the use of special and regular hunting seasons, issued under 50 CFR §20, and the issuance of depredation permits and special Canada goose permits, issued under 50 CFR §§21.41 and 21.26, respectively.

1. **Airport Depredation Order**

a. Biological Impacts

(1) Resident Canada Goose Populations

Similar to that discussed under the “No Action” alternative in section **IV.A.1.a. Resident Canada goose populations**. However, some localized significant goose population reductions could occur at or near participating airports.

(2) Natural Resources

Similar to that discussed under the “No Action” alternative in section **IV.A.1.b. Natural Resources**. However, some localized significant reductions in natural resource impacts caused by resident Canada geese at or near airports.

(3) Other Wildlife Including Federally Protected Species

See section **IV.A.1.c. Other Wildlife Including Federally Protected Species**. Most goose damage management activities would continue as they currently exist, however, likely increases in localized goose management activities would occur at or near participating airports. These activities could increase the potential for effects on T & E species over that in the “No Action” alternative. However, in general, all management activities authorized under this alternative are currently being implemented at airports under permitted actions. Entities and individuals authorized to conduct management activities under this alternative would be required to report the take of any T & E species to the Service immediately.

b. Sociological Impacts

(1) Sport Hunting

(a) Regular Hunting Seasons

See section **IV.A.2.a.(1) Regular Hunting Seasons**.

(b) Special Hunting Seasons

See section **IV.A.2.a.(2) Special Hunting Seasons**.

(2) Migratory Bird Permit Program

(a) Wildlife Services Program

Establishment of an Airport Depredation Order would result in an initial increase in Wildlife Services’ workload in two areas. First, all airports wishing to participate would be required to establish a non-lethal resident Canada goose harassment program. These programs would most likely be developed in cooperation and consultation with Wildlife Services. Second, following establishment of a non-lethal

harassment program, Wildlife Services would be required to certify the program before an airport could begin management actions under the Order. Once the programs are established, a subsequent Wildlife Services' workload reduction would likely result.

Most other workload regarding resident Canada geese would be largely unaffected and similar to that discussed under the "No Action" alternative in section **IV.A.2.b.(1) Wildlife Services Program**. However, it is possible that aggressive hazing programs at airports could translate to localized increases in goose complaints and conflicts, especially in urban areas near airports as these geese seek more protected areas.

(b) U.S. Fish and Wildlife Service Program

Most workload regarding resident Canada geese would be largely unaffected and similar to that discussed under the "No Action" alternative in section **IV.A.2.b.(2) U.S. Fish and Wildlife Service Program**. However, there would be a significant reduction in workload associated with permits for geese at airports. It is also possible that aggressive hazing programs at airports could translate to localized increases in goose complaints and conflicts, especially in urban areas near airports as these geese seek more protected areas.

(c) State Programs

Most workload regarding resident Canada geese would be largely unaffected and similar to that discussed under the "No Action" alternative in section **IV.A.2.b.(2) State Programs**. While there would be a significant reduction in workload associated with geese at airports, most States do not handle airport related problems but refer management activities in these areas to Wildlife Services. It is also possible that aggressive hazing programs at airports could translate to localized increases in goose complaints and conflicts, especially in urban areas near airports as these geese seek more protected areas.

(3) Social Values and Considerations

(a) Aesthetics

Similar to that discussed under the "No Action" alternative in section **IV.A.2.c.(1) Aesthetics**. However, some localized significant reductions in resident Canada goose viewing opportunities could occur at or near airports.

(b) Recreational Use of Impacted Areas

Similar to that discussed under the "No Action" alternative in section **IV.A.2.c.(2) Recreational Use of Impacted Areas**. However, some possible increases in resident Canada goose numbers at recreational areas, such as athletic fields, public swimming lakes, and parks, could occur as aggressive hazing of birds at participating airports causes displacement of geese to other protected areas near airports.

(c) Animal Rights and Humaneness

Similar to that discussed under the "No Action" alternative in section **IV.A.2.c.(3) Animal Rights and Humaneness**, however, some increased impact on resident Canada geese at or near airports.

(4) Economic Considerations

(a) Residential, Commercial, and Public Property

Similar to that discussed under the “No Action” alternative in section **IV.A.2.d.(1) Residential, Commercial, and Public Property**. However, some possible increases in resident Canada goose numbers at sites near airports could occur as aggressive hazing of birds at participating airports causes displacement of geese to other protected areas near airports.

(b) Agricultural Crops

Similar to that discussed under the “No Action” alternative in section **IV.A.2.d.(2) Agricultural Crops** with some possible increases in resident Canada goose numbers at agricultural sites around airports as aggressive hazing of birds at participating airports causes displacement of geese to other protected areas near airports.

(5) Human Safety

Under an Airport Depredation Order there would be significantly less resident Canada goose impacts at airports. Airports would be authorized to establish and implement a resident Canada goose management program that includes indirect and/or direct population control strategies such as aggressive harassment, nest and egg destruction, gosling and adult trapping and culling programs, or other general population reduction strategies on resident Canada goose populations posing threats to airport safety. Establishment of an Airport Depredation Order would significantly reduce the risk of goose-aircraft strikes at those airports participating in the depredation order.

Other human safety issue impacts would be similar to that discussed in section **IV.A.2.e. Human Safety** with some possible increases in resident Canada goose numbers at sites surrounding airports as aggressive hazing of birds at participating airports would likely cause displacement of geese to other protected areas near airports.

(6) Human Health

Similar to that discussed in section **IV.A.2.f. Human Health** with some possible increases in resident Canada goose numbers at sites around airports as aggressive hazing of birds at participating airports causes displacement of geese to other protected areas near airports.

(7) Costs of Management Program

(a) Administrative Costs

Overall, Wildlife Services and Service costs remain largely unaffected and similar to that discussed in section **IV.A.2.g.(1) Administrative Costs**. Wildlife Services would see an initial workload cost increase in establishing non-lethal harassment programs at airports.

(b) Monitoring Costs

No new costs. See section **IV.A.2.g.(2) Monitoring Costs**.

(c) Other Costs

Implementation of a Airport Depredation Order for resident Canada geese would result in significant savings to the aircraft industry, however, to what extent we are unsure. Canada geese, according to data from the National Wildlife Strike Database, 1991 to 1998, caused some damage in over 56 percent of reported goose strikes, and either destroyed or substantially damaged planes in 21.4 percent of reported goose strikes (Dolbeer et al. 2000). Where cost was estimated, the mean cost per goose strike was \$257,144 (Dolbeer et al. 2000). It is further estimated that only 20 - 25 percent of all bird strikes are reported (Conover et al. 1995, Dolbeer et al. 1995, Linnell et al. 1996, Linnell et al. 1999), hence the number of strikes involving Canada geese is likely greater than Federal Aviation Administration records show. For further discussion see section **III.B.4.a. Airports**.

Other costs would be similar to that discussed in section **IV.A.2.g.(1) Administrative Costs**.

2. **Nest and Egg Depredation Order**

a. Biological Impacts

(1) Resident Canada Goose Populations

Under this alternative, all permitted take of resident Canada geese nests and their eggs would be allowed without a permit. Impacts would be similar to that discussed under the “No Action” alternative and “Alternative C” in sections **IV.A.1.a. Resident Canada goose populations** and **IV.C.1.a. Resident Canada goose populations**, respectively.

In those areas subject to intensive nest and egg removal methods, some localized reductions in goose population growth rates and some localized gradual population stabilizations could occur depending on the local aggressiveness of nest and egg addling programs. However, as we estimated under “Alternative C” in section **IV.C.1.a. Resident Canada goose populations**, the overall effect would be limited.

An examination of Region 5 permit data from 1995-99 shows that although the Service authorized the take of eggs in approximately 15,000 nests per year (74,912 total nests), the reported take was only about 13 percent, or roughly 2,000 nests per year (**Appendix 11**). In Region 3 (Midwest/Great Lakes), 1999 data shows that permits authorized control actions in over 4,000 nests, however the reported take was less than 50 percent (**Appendix 11**). We believe that even with a Nest and Egg Depredation Order, it would not be possible to increase this figure over 130 fold in both the Mississippi and Atlantic Flyways. Thus, the resident goose population impact of this Depredation Order would be minimal, at anything other than a localized level.

(2) Natural Resources

Similar to that discussed under the “No Action” alternative in section **IV.A.1.b. Natural Resources**.

Some localized gradual reductions in natural resource impacts caused by resident Canada geese at localized areas subjected to continued nest and egg addling actions.

(3) Other Wildlife Including Federally Protected Species

See section **IV.A.1.c. Other Wildlife Including Federally Protected Species**. Some localized gradual reductions in impacts caused by resident Canada geese to other species at localized areas subjected to continued nest and egg addling actions. Additionally, most other goose damage management activities would continue as they currently exist. These activities could increase the potential for effects on T & E species over that in the “No Action” alternative. However, in general, all management activities authorized under this alternative are currently being implemented under permitted actions. Entities and individuals authorized to conduct management activities under this alternative would be required to report the take of any T & E species to the Service immediately.

b. Sociological Impacts

(1) Sport Hunting

(a) Regular Hunting Seasons

See section **IV.A.2.a.(1) Regular Hunting Seasons**.

(b) Special Hunting Seasons

See section **IV.A.2.a.(2) Special Hunting Seasons**.

(2) Migratory Bird Permit Program

(a) Wildlife Services Program

Although some localized population growth rates would gradually decline, most workload regarding resident Canada geese would be largely unaffected and similar to that discussed under the “No Action” alternative in section **IV.A.2.b.(1) Wildlife Services Program**.

(b) U.S. Fish and Wildlife Service Program

Under this alternative, there would be a significant reduction in workload associated with permits for nest and egg destruction. For example, in Region 5 (Northeastern/New England area), the Service issued 1,268 permits from 1995-99 authorizing control activities on resident Canada goose nests (see section **III.B.1.c.(2) U.S. Fish and Wildlife Service** for further information).

Most other workload regarding resident Canada geese would be largely unaffected and similar to that discussed in section **IV.A.2.b.(2) U.S. Fish and Wildlife Service Program**.

(c) State Programs

Although some localized population growth rates would gradually decline, most workload regarding

resident Canada geese would be largely unaffected and similar to that discussed under the “No Action” alternative in section **IV.A.2.b.(3) State Programs**.

(3) Social Values and Considerations

(a) Aesthetics

In the short-term, public viewing opportunities would see little impact and the problems associated with large numbers of geese, i.e., droppings, feathers, etc. would likely continue. In the long-term, impacts would be similar to that discussed under the “No Action” alternative in section **IV.A.2.c.(1) Aesthetics**. Some localized reductions in resident Canada goose viewing opportunities could occur and some of the associated aesthetic problems with too many geese could decrease as populations gradually decrease.

(b) Recreational Use of Impacted Areas

In the short-term, impacts would continue. In the long-term, some localized goose population reductions would result in reduced levels of impacts. Overall, similar to that discussed under the “No Action” alternative in section **IV.A.2.c.(2) Recreational Use of Impacted Areas**.

(c) Animal Rights and Humaneness

See section **IV.A.2.c.(3) Animal Rights and Humaneness**. Those opposed to the take of geese would support this alternative, however, other permitted actions and sport hunting seasons would continue to be allowed under this alternative and those actions would be opposed by this same group.

(4) Economic Considerations

(a) Residential, Commercial, and Public Property

Continued impacts and conflicts until localized goose populations gradually level off at reduced levels. At which point, impacts likely lessen. Overall, similar to that discussed under the “No Action” alternative in section **IV.A.2.d.(1) Residential, Commercial, and Public Property**.

(b) Agricultural Crops

Since the management actions approved under the Depredation Order would most likely target geese in urban and suburban areas, impacts to agricultural areas would continue and be similar to that discussed under the “No Action” alternative in section **IV.A.2.d.(2) Agricultural Crops**.

(5) Human Safety

Continued impacts. Assuming uninterrupted continuation of the program over a significant number of years (over 10), problem goose populations would gradually level off at reduced levels. At which point, some localized impacts probably lessen. Overall, similar to that discussed under the “No Action” alternative in section **IV.A.2.e. Human Safety**.

(6) Human Health

In the short-term, impacts would continue and the potential problems associated with large numbers of geese would likely also continue. In the long-term, impacts would be similar to that discussed under the “No Action” alternative in section **IV.A.2.f. Human Health**, although some localized reductions in resident Canada geese could occur and some of the associated potential health problems could decrease as populations gradually decrease.

(7) Costs of Management Program

(a) Administrative Costs

Overall, Wildlife Services and Service costs remain largely unaffected and similar to that discussed under the “No Action” alternative in section **IV.A.2.g.(1) Administrative Costs**. The Service would see a slight reduction in costs associated with permit issuance for nest and egg destruction.

(b) Monitoring Costs

No significant new costs. See section **IV.A.2.g.(2) Monitoring Costs**.

(c) Other Costs

Similar to that discussed under the “No Action” alternative and “Alternative C” in section **IV.A.2.g.(2) Other Costs** and **IV.C.2.g.(2) Other Costs**, respectively.

3. **Agricultural Depredation Order**

a. Biological Impacts

(1) Resident Canada Goose Populations

Similar to that discussed under the “No Action” alternative in section **IV.A.1.a. Resident Canada goose populations**. However, some localized goose population reductions could occur at or near participating agricultural areas.

(2) Natural Resources

Similar to that discussed under the “No Action” alternative in section **IV.A.1.b. Natural Resources**. However, some localized significant reductions in natural resource impacts caused by resident Canada geese at or near participating agricultural areas.

(3) Other Wildlife Including Federally Protected Species

See section **IV.A.1.c. Other Wildlife Including Federally Protected Species**. In general, most goose damage management activities would continue as they currently exist, however, there would be likely increases in goose management activities at or near participating agricultural areas. While these activities could increase the potential for effects on T & E species over that in the “No Action”

alternative, all management activities authorized under this alternative are currently being implemented under depredation permits (although not to the number or extent authorized under this alternative) . Entities and individuals authorized to conduct management activities under this alternative would be required to report the take of any T & E species to the Service immediately.

b. Sociological Impacts

(1) Sport Hunting

(a) Regular Hunting Seasons

See section **IV.A.2.a.(1) Regular Hunting Seasons.**

(b) Special Hunting Seasons

See section **IV.A.2.a.(2) Special Hunting Seasons.**

(2) Migratory Bird Permit Program

(a) Wildlife Services Program

Establishment of an Agricultural Depredation Order would result in an initial increase in Wildlife Services' workload in two areas. First, all agricultural areas wishing to participate would be required to establish a non-lethal resident Canada goose harassment program. These programs would most likely be developed in cooperation and consultation with Wildlife Services. Second, following establishment of a non-lethal harassment program, Wildlife Services would be required to certify the program before an area could begin management actions under the Order. Once the programs are established, a subsequent workload reduction would likely result.

Most other workloads regarding resident Canada geese would be largely unaffected and similar to that discussed under the "No Action" alternative in section **IV.A.2.b.(1) Wildlife Services Program.** However, it is possible that aggressive hazing programs at agricultural areas could translate to localized increases in goose complaints and conflicts, especially in urban areas near these areas as these geese seek more protected areas.

(b) U.S. Fish and Wildlife Service Program

Most workload regarding resident Canada geese would be largely unaffected and similar to that discussed under the "No Action" alternative in section **IV.A.2.b.(2) U.S. Fish and Wildlife Service Program.** However, there would be a significant reduction in workload associated with permits for depredating geese in agricultural areas. It is also possible that aggressive hazing programs at agricultural areas could translate to localized increases in goose complaints and conflicts, especially in urban areas near agricultural areas as these geese seek more protected areas.

(c) State Programs

Most workload regarding resident Canada geese would be largely unaffected and similar to that discussed

under the “No Action” alternative in section **IV.A.2.b.(3) State Programs**. However, there would be a significant reduction in workload associated with depredating geese in agricultural areas. It is also possible that aggressive hazing programs at agricultural areas could translate to localized increases in goose complaints and conflicts, especially in urban areas near agricultural areas as these geese seek more protected areas.

(3) Social Values and Considerations

(a) Aesthetics

Similar to that discussed under the “No Action” alternative in section **IV.A.2.c.(1) Aesthetics**. However, some localized significant reductions in resident Canada goose viewing opportunities could occur at or near participating agricultural areas.

(b) Recreational Use of Impacted Areas

Similar to that discussed under the “No Action” alternative in section **IV.A.2.c.(2) Recreational Use of Impacted Areas**. Some possible increases in resident Canada goose numbers at recreational areas, such as athletic fields, public swimming lakes, and parks, could occur as aggressive hazing of birds at participating agricultural areas causes displacement of geese to other protected areas near agricultural areas.

(c) Animal Rights and Humaneness

Similar to that discussed under the “No Action” alternative in section **IV.A.2.c.(3) Animal Rights and Humaneness**, however, some increased impact on resident Canada geese at or near agricultural areas.

(4) Economic Considerations

(a) Residential, Commercial, and Public Property

Similar to that discussed under the “No Action” alternative in section **IV.A.2.d.(1) Residential, Commercial, and Public Property**. Some possible increases in resident Canada goose numbers at recreational, commercial, and public sites around agricultural areas could occur as aggressive hazing of birds at participating agricultural areas causes displacement of geese to other protected areas near agricultural areas.

(b) Agricultural Crops

Under an Agricultural Depredation Order there would be significantly less resident Canada goose impacts at participating agricultural sites. Landowners, operators, and tenants actively engaged in the production of commercial agriculture (or their employees or agents) would be authorized to conduct indirect and/or direct population control strategies such as aggressive harassment, nest and egg destruction, gosling and adult trapping and culling programs, or other general population reduction strategies on resident Canada goose populations when found committing or about to commit depredations to agricultural crops.

In States such as Maryland, Virginia, Massachusetts, New York, Pennsylvania, Minnesota, South Dakota, North Dakota, and Oklahoma, resident Canada geese are causing significant agricultural damage. Collectively, resident Canada geese caused over \$3.0 million in damages last year in these States alone (see section **III.B.3.b. Agricultural Crops**). Establishment of an Agricultural Depredation Order would significantly reduce goose depredation at those commercial agriculture sites participating in the depredation order.

Other agricultural impacts would be similar to that discussed under the “No Action” alternative in section **IV.A.2.d.(2) Agricultural Crops** with some possible increases in resident Canada goose numbers at nonparticipating sites around these agricultural areas as aggressive hazing of birds at participating sites would likely cause displacement of geese to other protected areas.

(5) Human Safety

Similar to that discussed under the “No Action” alternative in section **IV.A.2.e. Human Safety** with some possible increases in resident Canada goose numbers at sites around agricultural areas, such as airports, as aggressive hazing of birds at participating agricultural areas causes displacement of geese to other protected areas near agricultural areas.

(6) Human Health

Similar to that discussed under the “No Action” alternative in section **IV.A.2.f. Human Health** with some possible increases in resident Canada goose numbers at sites around agricultural areas as aggressive hazing of birds at participating agricultural areas causes displacement of geese to other protected areas near agricultural areas.

(7) Costs of Management Program

(a) Administrative Costs

Overall, Wildlife Services and Service costs remain largely unaffected and similar to that discussed under the “No Action” alternative in section **IV.A.2.g.(1) Administrative Costs**. Wildlife Services would see an initial increase in establishing non-lethal harassment programs at agricultural areas.

(b) Monitoring Costs

No significant new costs. See section **IV.A.2.g.(2) Monitoring Costs**.

(c) Other Costs

Implementation of a Agricultural Depredation Order for resident Canada geese would undoubtedly result in significant savings to the agricultural industry, however, to what extent we are unsure. Canada geese caused over \$3.0 million in damages last year in States such as Maryland, Virginia, Massachusetts, New York, Pennsylvania, Minnesota, South Dakota, North Dakota, and Oklahoma (see section **III.B.3.b. Agricultural Crops**). Establishment of an Agricultural Depredation Order would significantly reduce goose depredation at those commercial agriculture sites participating in the depredation order.

Other costs would be similar to that discussed under the “No Action” alternative in section **IV.A.2.g.(1) Administrative Costs.**

4. **Public Health Depredation Order**

a. Biological Impacts

(1) Resident Canada Goose Populations

Similar to that discussed under the “No Action” alternative in section **IV.A.1.a. Resident Canada goose populations.** However, some localized significant goose population reductions could occur at sites recommended by public health officials as public health threats.

(2) Natural Resources

Similar to that discussed under the “No Action” alternative in section **IV.A.1.b. Natural Resources.** However, some localized significant reductions in natural resource impacts caused by resident Canada geese at or near sites recommended by public health officials as public health threats.

(3) Other Wildlife Including Federally Protected Species

See section **IV.A.1.c. Other Wildlife Including Federally Protected Species.** In general, most goose damage management activities would continue as they currently exist, however, there would be likely increases in localized goose management activities at or near participating areas of public health concern. While these activities could increase the potential for effects on T & E species over that in the “No Action” alternative, all management activities authorized under this alternative are currently being allowed under Service-permitted actions. Entities and individuals authorized to conduct management activities under this alternative would be required to report the take of any T & E species to the Service immediately.

b. Sociological Impacts

(1) Sport Hunting

(a) Regular Hunting Seasons

See section **IV.A.2.a.(1) Regular Hunting Seasons.**

(b) Special Hunting Seasons

See section **IV.A.2.a.(2) Special Hunting Seasons.**

(2) Migratory Bird Permit Program

(a) Wildlife Services Program

Establishment of a Public Health Depredation Order would result in an initial increase in Wildlife Services' workload. Workload increases would likely come in two areas. First, all public health areas of concern wishing to participate would be required to establish a non-lethal resident Canada goose harassment program. These programs would most likely be developed in cooperation and consultation with Wildlife Services. Second, following establishment of a non-lethal harassment program, Wildlife Services would be required to certify the program before a site could begin management actions under the Order. Once the programs are established, a subsequent workload reduction would likely result.

Most other workloads regarding resident Canada geese would be largely unaffected and similar to that discussed under the "No Action" alternative in section **IV.A.2.b.(1) Wildlife Services Program**. However, it is possible that aggressive hazing programs at these specific sites could translate to localized increases in goose complaints and conflicts, especially in other protected areas close by as these geese seek more protected areas.

(b) U.S. Fish and Wildlife Service Program

Most workloads regarding resident Canada geese would be largely unaffected and similar to that discussed under the "No Action" alternative in section **IV.A.2.b.(2) U.S. Fish and Wildlife Service Program**. However, there would be a significant reduction in workload associated with permits for geese causing public health concerns. It is also possible that aggressive hazing programs at these sites could translate to localized increases in goose complaints and conflicts, especially in other urban areas near these sites as these geese seek more protected areas.

(c) State Programs

Most workloads regarding resident Canada geese would be largely unaffected and similar to that discussed under the "No Action" alternative in section **IV.A.2.b.(3) State Programs**. However, there would be a significant reduction in workload associated with geese causing public health concerns. It is also possible that aggressive hazing programs at these sites could translate to localized increases in goose complaints and conflicts, especially in other urban areas near these sites as these geese seek more protected areas.

(3) Social Values and Considerations

(a) Aesthetics

Similar to that discussed under the "No Action" alternative in section **IV.A.2.c.(1) Aesthetics**. However, some localized significant reductions in resident Canada goose viewing opportunities could occur at or near sites recommended by public health officials as public health threat areas.

(b) Recreational Use of Impacted Areas

Similar to that discussed under the "No Action" alternative in section **IV.A.2.c.(2) Recreational Use of**

Impacted Areas. However, some possible increases in resident Canada goose numbers at recreational areas, such as athletic fields, public swimming lakes, and parks, could occur as aggressive hazing of birds at participating public health areas causes displacement of geese to other protected areas, especially in urban and suburban environments.

(c) Animal Rights and Humaneness

Similar to that discussed under the “No Action” alternative in section **IV.A.2.c.(3) Animal Rights and Humaneness**, however, some increased impact on resident Canada geese at or near sites recommended by public health officials as public health threats.

(4) Economic Considerations

(a) Residential, Commercial, and Public Property

Similar to that discussed under the “No Action” alternative in section **IV.A.2.d.(1) Residential, Commercial, and Public Property**. However, some possible increases in resident Canada goose numbers at recreational, commercial, and public areas around public health sites could occur as aggressive hazing of birds at recommended public health areas causes displacement of geese to other protected areas, such as residential and commercial areas.

(b) Agricultural Crops

Similar to that discussed under the “No Action” alternative in section **IV.A.2.d.(2) Agricultural Crops**. However, some possible increases in resident Canada goose numbers at agricultural areas could occur as aggressive hazing of birds at public health sites causes displacement of geese to other protected areas near these areas.

(5) Human Safety

Similar to that discussed under the “No Action” alternative in section **IV.A.2.e. Human Safety** with some possible increases in resident Canada goose numbers at sites around recommended public health areas as aggressive hazing of birds at these sites causes displacement of geese to other protected areas, such as airports.

(6) Human Health

Under a Public Health Depredation Order there would be significantly less resident Canada goose impacts at sites recommended as public health threats from Canada geese. State, County, municipal, or local public health officials (or their agents) would be authorized to conduct indirect and/or direct population control strategies such as aggressive harassment nest and egg destruction, gosling and adult trapping and culling programs, or other general population reduction strategies on resident Canada goose populations when recommended by health officials that there is a public health threat.

State wildlife management agencies and public health officials would strongly approve of this alternative since public health concerns were identified as a growing concern during public scoping. While we agree that transmission of disease or parasites from geese to humans has not been well documented, the

potential does exist (Luechtefeld et al. 1980, Wobeser and Brand 1982, Hill and Grimes 1984, Pacha et al. 1988, Blandespoor and Reimink 1991, Graczyk et al. 1997, Saltoun, et al. 2000). And while many people are concerned about disease transmission from fecal droppings, the probability of contracting disease from fecal droppings is believed to be small. However, in recognition and deference to the authority and expertise of local and State health officials, under this alternative, the determination of what does or does not constitute a threat to public health is left to these public health authorities.

As discussed in section **III.B.5. Human Health**, there is a perception among the public and a concern among resource management personnel that resident Canada geese do have the ability to transmit diseases to humans, but a direct link is difficult to establish due to the expense of testing and the difficulty of tracing the disease back to Canada geese. Studies have confirmed the presence of human pathogens in goose feces, so the presence of these feces in water or on the ground where humans may come into contact with them is a legitimate public health concern. Neither we nor State natural resource agencies have the expertise to deal with human health/disease questions, and thus, must rely on other more pertinent knowledgeable agencies. Establishment of a Public Health Depredation Order would significantly reduce potential resident Canada goose health concerns at those recommended sites participating in the depredation order.

Other human health impacts would be similar to that discussed under the “No Action” alternative in section **IV.A.2.f. Human Health** with some possible increases in resident Canada goose numbers at non-participating sites around these areas as aggressive hazing of birds at participating sites would likely cause displacement of geese to other protected areas.

(7) Costs of Management Program

(a) Administrative Costs

Overall, Wildlife Services and Service costs remain largely unaffected and similar to that discussed under the “No Action” alternative in section **IV.A.2.g.(1) Administrative Costs**. Wildlife Services would see an initial increase in establishing non-lethal harassment programs at these sites.

(b) Monitoring Costs

No significant new costs. See section **IV.A.2.g.(2) Monitoring Costs**.

(c) Other Costs

Similar to that discussed in section **IV.A.2.g.(2) Other Costs**.

5. Summary of Integrated Depredation Order Management

Used in concert, the four Depredation Orders could provide localized relief in specific resident Canada goose conflict areas: airports, urban/suburban areas, agricultural areas, and potential public health threat areas. Under the Depredation Orders, resident Canada goose management activities would be specifically directed to those areas needing direct relief from ongoing goose damage or conflicts.

a. Biological Impacts

(1) Resident Canada Goose Populations

Some localized significant goose population reductions could occur at or near participating airports, participating agricultural areas, or at sites recommended by public health officials as public health threats. Additionally, some localized reductions in goose population growth rates and some localized gradual population stabilizations could occur depending on the local aggressiveness of nest and egg addling programs. Taken together, while some localized goose population impacts could be significant, the Depredation Orders would not result in overall significant resident goose population reductions. Overall population impacts would likely be less than those realized under “Alternative D (Increased Hunting)”, but significantly more than under the “No Action” Alternative.

(2) Natural Resources

Similar to that discussed under the “No Action” alternative in section **IV.A.1.b. Natural Resources**. However, some localized significant reductions in natural resource impacts caused by resident Canada geese at or near participating airports, participating agricultural areas, or sites recommended by public health officials as public health threats. Additionally, some localized gradual reductions in natural resource impacts caused by resident Canada geese at localized areas subjected to continued nest and egg addling actions.

(3) Other Wildlife Including Federally Protected Species

See section **IV.A.1.c. Other Wildlife Including Federally Protected Species**. Overall, most goose damage management activities would continue as they currently exist. There would be likely increases in localized goose management activities at or near participating airports, agricultural areas, and areas of public health concern. While these activities could increase the potential for effects on T & E species over that in the “No Action” alternative, all management activities authorized under this alternative are currently being allowed under Service-permitted actions. Entities and individuals authorized to conduct management activities under this alternative would be required to report the take of any T & E species to the Service immediately.

In addition, there could be some localized reductions in impacts caused by resident Canada geese to other species at localized areas subjected to the various management actions.

b. Sociological Impacts

(1) Sport Hunting

See section **IV.A.2.a. Sport Hunting**.

(2) Migratory Bird Permit Program

(a) Wildlife Services

Establishment of the various Depredation Orders would result in initial increases in Wildlife Services’

workload in two areas. First, all eligible parties (i.e., airports, agricultural producers, public health officials) wishing to participate would be required to establish a non-lethal resident Canada goose harassment program. These programs would most likely be developed in cooperation and consultation with Wildlife Services. Second, following establishment of a non-lethal harassment program, Wildlife Services would be required to certify the program before any management actions could occur under the Order. Once the programs are established, a subsequent significant reduction in Wildlife Services' workload would likely result.

Other workload regarding resident Canada geese would be largely unaffected and similar to that discussed under the "No Action" alternative in section **IV.A.2.b.(1) Wildlife Services Program**. It is also possible that aggressive hazing programs at these specific sites could translate to localized increases in goose complaints and conflicts, especially in urban and suburban areas close to actively managed areas as these geese seek more protected areas.

(b) U.S. Fish and Wildlife Service Program

Most workload regarding resident Canada geese would be largely unaffected and similar to that discussed under the "No Action" alternative in section **IV.A.2.b.(2) U.S. Fish and Wildlife Service Program**. However, there would be a significant reduction in workload associated with permits for geese at airports, depredating geese in agricultural areas, and for geese causing public health concerns. It is possible, however, that aggressive hazing programs at these sites could translate to localized increases in goose complaints and conflicts, especially in urban areas as these geese seek more protected areas. There would also be a significant reduction in workload associated with permits for nest and egg destruction.

(c) State Programs

Most workload regarding resident Canada geese would be largely unaffected and similar to that discussed under the "No Action" alternative in section **IV.A.2.b.(3) State Programs**. There would be a significant reduction in workload associated with geese at airports, depredating geese in agricultural areas, and geese causing public health concerns. It is possible, however, that aggressive hazing programs at these sites could translate to localized increases in goose complaints and conflicts, especially in urban areas as these geese seek more protected areas. There would also be a significant reduction in workload associated with request for nest and egg destruction.

(3) Social Values and Considerations

Impacts to aesthetics would be similar to that discussed under the "No Action" alternative in section **IV.A.2.c.(1) Aesthetics**. Some localized significant reductions in resident Canada goose viewing opportunities could occur at or near participating airports, agricultural areas, and sites recommended by public health officials as public health threat areas. Overall, other than these specific areas, in the short-term, public viewing opportunities would see little impact and the problems associated with large numbers of geese, i.e., droppings, feathers, etc. would likely continue. In the long-term, some localized reductions in resident Canada goose viewing opportunities could occur and some of the associated aesthetic problems with too many geese could decrease as populations gradually decrease.

Impacts to recreational areas would also be similar to that discussed under the "No Action" alternative in section **IV.A.2.c.(2) Recreational Use of Impacted Areas**. However, some possible increases in

resident Canada goose numbers at recreational areas, such as athletic fields, public swimming lakes, and parks, could occur as aggressive hazing of birds at participating airports, agricultural areas, and recommended public health areas causes displacement of geese to other protected areas. In the long-term, some localized goose population reductions would result in reduced levels of impacts.

Impacts to animal rights and humaneness would be similar to that discussed under the “No Action” alternative in section **IV.A.2.c.(3) Animal Rights and Humaneness**, however, some increased impacts on resident Canada geese would occur at or near participating airports, agricultural sites, and sites recommended by public health officials as public health threats.

(4) Economic Considerations

Other than agricultural areas, and those sites recommended as public health threat areas, impacts to private property would be similar to that discussed under the “No Action” alternative in section **IV.A.2.d.(1) Residential, Commercial, and Public Property**. Additionally, some possible increases in resident Canada goose numbers at recreational, commercial, and public areas around sites participating under the various Depredation Orders could occur as aggressive hazing of birds at these areas causes displacement of geese to other protected areas, such as residential and commercial areas. In the long-term, under the Nest and Egg Depredation Order, localized impacts and conflicts could gradually level off at reduced levels as populations are gradually reduced.

Agricultural areas would experience significant benefits from an Agricultural Depredation Order as there would be significantly less resident Canada goose impacts at participating agricultural sites. Establishment of an Agricultural Depredation Order would significantly reduce goose depredation at those commercial agriculture sites participating in the depredation order.

(5) Human Safety

Under the Airport Depredation Order there would be significantly less resident Canada goose impacts at airports. Establishment of an Airport Depredation Order would significantly reduce the risk of goose-aircraft strikes at those airports participating in the depredation order.

Other human safety issues impacts would be similar to that discussed under the “No Action” alternative in section **IV.A.2.e. Human Safety** with some possible increases in resident Canada goose numbers at non-participating sites around these areas as aggressive hazing of birds at participating sites would likely cause displacement of geese to other protected areas. In the long-term, through the Nest and Egg Depredation Order, some localized reductions in resident Canada geese could occur and some of the other associated potential safety problems could decrease as goose populations gradually decrease.

(6) Human Health

Under this alternative, if all four Depredation Orders were implemented, the potential benefits to solving problems associated with large numbers of geese would be significant at sites recommended as public health threat areas. Under the Public Health Depredation Order, specific problem areas could be specifically addressed by public health officials. Geese displaced from these areas to other protected areas, such as airports or agricultural areas, as a result of aggressive hazing, could likewise be specifically handled under the Airport or Agricultural Depredation Order. In the long-term, through the

Nest and Egg Depredation Order, some localized reductions in resident Canada geese could occur and some of the other associated potential health problems could decrease as populations gradually decrease.

Other human health impacts outside these specific areas covered by the Depredation Orders would be similar to that discussed under the “No Action” alternative in section **IV.A.2.f. Human Health** with some possible increases in resident Canada goose numbers at non-participating sites around these areas as aggressive hazing of birds at participating sites would likely cause displacement of geese to other protected areas.

(7) Costs of Management Program

Overall, both Wildlife Services and Service costs would remain largely unaffected and similar to that discussed under the “No Action” alternative in section **IV.A.2.g.(1) Administrative Costs**. Wildlife Services would see initial increases in help to establish non-lethal harassment programs at airports, agricultural areas, and public health locations. However, implementation of a Depredation Order for resident Canada geese would undoubtedly result in significant savings to the agricultural and airport industry, and would lessen public costs at areas of public health concern.

Additionally, the Service would see a slight reduction in costs associated with permit issuance for nest and egg destruction. However, as discussed under “Alternative C” in section **IV.C.2.g.(1) Other Costs**, other costs related to nest and egg destruction would have to be borne by some entity. Using Cooper and Keefe’s (1997) estimated removal costs in Minnesota of \$6.38 per egg, the egg removal cost estimate for the entire Mississippi Flyway translates to (264,000 nests X 6.0 eggs per nest X \$6.38 per egg) \$10.1 million per year to induce population decline in the Flyway. Expanding this program over the necessary 10 year time period (see section **IV.C.1.a. Resident Canada Goose Populations**) to all Flyways would result in hundreds of millions of dollars in expenditures.

F. ALTERNATIVE F - STATE EMPOWERMENT (PROPOSED ACTION)

1. Biological Impacts

a. Resident Canada Goose Populations

Under the “No Action” alternative (see section **IV.A.1.a. Resident Canada Goose Populations**), we estimated that the population of resident geese in most areas would be expected to continue to increase until they reach the carrying capacity of the environment. In the Atlantic Flyway, we estimated that the population will approach 1.3 million in 5 years and 1.6 million in 10 years. In the Mississippi Flyway, we estimate that the population will approach 1.7 million in 5 years and 2.0 million in 10 years. In the Central Flyway, we estimate that the numbers in the BHPS will approach 1.26 million by 2010. In the Pacific Flyway, we estimate that the populations will approach 450,000 by 2010.

In light of these projected increases (despite past and current management actions), we believe a much more aggressive management program is warranted and must be implemented. Under the “State Empowerment” alternative, State wildlife management agencies would be provided flexibility, within predefined guidelines, to deal with the problems caused by resident Canada goose populations within their respective States. States could choose to implement specific strategies, such as any of the specific

depredation orders identified in Alternative E (Integrated Depredation Order Management), expand hunting opportunities, or implement other indirect and/or direct population control strategies. We believe the combination of various management strategies would successfully reduce numbers of resident Canada geese to more acceptable levels.

Recently completed resident Canada goose modeling in Missouri (Coluccy 2000; Coluccy and Graber 2000), when extrapolated to the entire Mississippi Flyway, indicates that to reduce the Mississippi Flyway's resident population from the current 1,335,683 geese to the Flyway Council's goal of 989,000 geese would require one of several management actions: 1) the harvest of an additional 240,000 geese annually over that already occurring; 2) the take of an additional 426,000 goslings per year; 3) a Flyway-wide nest removal of 264,000 nests annually; or 4) a combination of harvesting an additional 120,000 geese annually and the take of an additional 160,000 goslings per year. Each of these management alternatives would be required annually for 10 years to reach the Flyway's population management goal. In the Atlantic Flyway, where the resident Canada goose population is even further above established Flyway goals, these numbers would be even greater. Similar numbers would be expected in the Central Flyway, while numbers would be correspondingly smaller in the Pacific Flyway.

Thus, to reduce the four Flyways' resident populations from the current level of approximately 3.5 million to the Flyway Councils' goals of approximately 2.1 million geese would require, at a minimum for the next 10 years, either the harvest of an additional 480,000 geese annually, the take of an additional 852,000 goslings per year, a Flyway-wide nest removal of 528,000 nests annually, or a combination of the harvest of an additional 240,000 geese annually and the take of an additional 320,000 goslings per year. We believe the only way to possibly attain these numbers is to give the States *the flexibility* to address the problems caused by resident Canada goose populations within their respective States. By addressing population reductions on a wide number of available fronts, we believe the combination of various damage management strategies and population control strategies would successfully reduce numbers of resident Canada geese *in those priority areas identified by the States*. Since the States are the most informed and knowledgeable local authorities on wildlife conflicts in their respective States, we believe it is logical to place the primary responsibilities and decisions of the program with them.

For example, in those areas subject to intensive nest and egg removal methods, some localized population stabilizations and reductions could take place. While the overall effect would be limited, as we estimated in section **IV.C.1.a. Resident Canada goose populations** and **IV.E.2.a.(1) Resident Canada goose populations**, the management actions would help contribute to the overall population reduction and help address specific goose problem areas.

Likewise, the combination of Depredation Orders discussed in "Alternative E", while not solely able to address all goose population conflicts would help contribute to the overall population reduction and help address specific resident goose problem areas.

Additionally, as discussed in section **IV.F.2.a.(2) Special Hunting Seasons**, States could opt to increase and expand hunting opportunities in those areas already opened (September 1-15) to expanded hunting methods. While neither a 50 percent increase (an additional 260,000 resident Canada geese) or a 70 percent increase (an additional 364,000 resident Canada geese) in special season harvest annually would solely achieve the desired population stabilization or reduction, the management actions would help contribute to the overall population reduction and help address specific resident goose problem areas.

b. Natural Resources

Under Alternative F, impacts of excessive numbers of resident Canada geese to soil and water resources would be significantly reduced. Decreased numbers of geese, especially in urban and suburban areas, would likely lead to improved water quality around beaches and wetlands because of the decreased amount of fecal droppings and decreased grazing by Canada geese.

c. Other Wildlife Including Federally Protected Species

Under the “State Empowerment” alternative, we would not expect any new effects on T & E species since resident Canada goose management activities would continue under current practices and conditions. Conditions in the alternative (primarily timing restrictions) would preclude any new adverse effects on T & E species. Overall, most goose damage management activities would continue as they currently exist. Depending on the State’s selection of strategies, there could be likely increases in goose management activities at or near participating airports, agricultural areas, and areas of public health concern. While these activities could increase the potential for effects on T & E species over that in the “No Action” alternative, all management activities authorized under this alternative are currently being allowed under Service-permitted actions. Entities and individuals authorized to conduct management activities under this alternative would be required to report the take of any T & E species to the Service immediately.

Additionally, most management actions with resident Canada geese, other than expanded hunting opportunities under the new conservation season (August 1 to September 15) and existing operational special Canada goose seasons (September 1-15), would occur during the spring nesting season and the summer molt (generally occurs in June and July). All of these seasonal management actions, including expanded hunting opportunities, would take only resident geese due to the absence of migratory Canada goose populations at these times of the year. All direct capture and removal methods would allow for positive identification of target species and there has been no impact observed on non-target, threatened, or endangered species. See section **III.A.4. Other Wildlife Including Federally Protected Species** for a further discussion of current effects on T & E species.

There would be a significant reduction in resident goose impacts on other migratory waterfowl. Less resident Canada geese would likely result in reduced damage to habitat intended for wintering and migrating waterfowl.

2. Sociological Impacts

a. Sport Hunting

(1) Regular Hunting Seasons

See section **IV.A.2.a.(1) Regular Hunting Seasons**. Regular hunting seasons would be largely unaffected under the “State Empowerment” alternative. There could be some reductions in hunting opportunities in areas close to urban and suburban areas as goose populations decrease. However, most goose population reductions would occur in areas already closed to hunting or with limited hunting opportunity.

(2) Special Hunting Seasons

Under the “State Empowerment” alternative, resident Canada goose special hunting opportunities and potential harvest would be significantly increased from that discussed in section **IV.D.2.a.(2) Special Hunting Seasons**. States could opt to increase and expand special hunting opportunities for resident Canada geese through newly available hunting methods and an expansion of the special seasons.

Under the “Increased Hunting” alternative (Alternative D), special season resident Canada goose hunting opportunities would increase significantly. This alternative would provide new regulatory options to State wildlife management agencies to potentially increase the harvest of resident Canada geese above that which results from existing special Canada goose seasons that target resident Canada geese. This approach would authorize the use of additional hunting methods such as electronic calls, unplugged shotguns, and expanded shooting hours (one-half hour after sunset). During existing, operational, special September Canada goose seasons (i.e., September 1-15), these additional hunting methods would be available for use on an operational basis. Utilization of these additional hunting methods during any new special seasons or other existing, operational special seasons (i.e., September 15-30) could be approved as experimental and would require demonstration of a minimal impact to migrant Canada goose populations. These experimental seasons would be authorized on a case-by-case basis through the normal migratory bird hunting regulatory process. All of these expanded hunting methods and opportunities would be in accordance with the existing Migratory Bird Treaty frameworks for sport hunting seasons (i.e., 107 day limit from September 1 to March 10) and would be conducted outside of any other open waterfowl season (i.e., when all other waterfowl and crane seasons were closed). These additional seasons would continue to be available to States under the “State Empowerment” alternative.

Additionally, under new regulations implementing Service established criteria and guidelines, States would be able to offer special expanded harvest opportunities during either the Treaty closed period (August 1-31) and the Treaty open period (September 1-15). This alternative would create a new Subpart to 50 CFR Part 21 specifically for the management of overabundant resident Canada goose populations. Under this new Subpart, we would establish a Conservation Order under the authority of the Migratory Bird Treaty Act with the intent to reduce and/or stabilize resident Canada goose population levels. The Conservation Order would authorize each State in eligible areas to initiate aggressive resident Canada goose harvest strategies, within the conditions that we provide, with the intent to reduce the populations. The Order will enable States to use hunters to harvest resident Canada geese, by way of shooting in a hunting manner, during a period when all waterfowl and crane hunting seasons, excluding falconry, are closed, inside or outside the migratory bird hunting season frameworks. The Order would also authorize the use of additional methods of take to harvest resident Canada geese during that period. The Conservation Order would authorize the use of electronic calls and unplugged shotguns, liberalize daily bag limits on resident Canada geese, and allow shooting hours to continue until one-half hour after sunset. The Service would annually assess the overall impact and effectiveness of the Conservation Order to ensure compatibility with long-term conservation of this resource. If at any time evidence is presented that clearly demonstrates that there no longer exists a serious threat of injury to the area or areas involved for a particular resident Canada goose population, we will initiate action to suspend the Conservation Order, and/or regular-season regulation changes, for that population. Suspension of regulations for a particular population would be made following a public review process.

As discussed in section **IV.D.2.a.(2) Special Hunting Seasons**, available information from the use of additional hunting methods, such as electronic calls, unplugged shotguns, and expanded shooting hours,

during the special light goose seasons indicate that total harvest increased approximately 50 - 69 percent (U.S. Fish and Wildlife Service, 2001b). On specific days when light goose special regulations were in effect, the mean light goose harvest increased 244 percent (U.S. Fish and Wildlife Service, 2001b). This increase was attributable in large part to the Light Goose Conservation Order which authorized additional days of hunting outside the regular hunting season frameworks (September 1 - March 10). Olsen and Afton (2000) found that lesser snow goose flocks were 5.0 times more likely to fly within gun range (≤ 50 meters) in response to electronic calls than to traditional calls and the mean number of snow geese killed per hour per hunter averaged 9.1 times greater for electronic calls than for traditional calls.

Given a total special season harvest of approximately 520,000 geese, a 50 percent increase in special season and conservation season harvest would result in the harvest of an additional 260,000 resident Canada geese each year. A 70 percent increase in special season and conservation season harvest would result in an additional 364,000 resident Canada geese annually. While neither of these estimates would solely achieve the desired population stabilization or reduction (see section **IV.F.1.a. Resident Canada goose populations**), these additional authorized methods, when used in concert with other management activities, would help to significantly reduce resident Canada goose numbers.

b. Migratory Bird Permit Program

(1) Wildlife Services Program

Under the “State Empowerment” alternative, Wildlife Service’s workload would vary depending on the States’ selection of management strategies. In those States choosing to continue current operations and management, the Wildlife Service’s program would be largely unaffected. In those States choosing to alter their current management to take advantage of conditions offered by the “State Empowerment” alternative, there would be a probable significant initial workload increase establishing non-lethal harassment programs and assisting in establishing and implementing other programs.

Workload increases would likely come in two areas. First, States opting to establish one or more of the various depredation orders would be required to have eligible parties (i.e., airports, agricultural producers, public health officials) wishing to participate establish a non-lethal resident Canada goose harassment program. These programs would most likely be developed in cooperation and consultation with Wildlife Services. Second, following establishment of a non-lethal harassment program, Wildlife Services would be required to certify the program before any management actions could occur under any of the Orders.

Once the States’ programs were established and goose conflicts lessened due to a smaller goose population, a subsequent significant reduction in Wildlife Services’ workload would likely result. However, it is likely that much of the remaining resulting workload would be “maintenance” in nature and similar to that discussed in section **IV.A.2.b.(1) Wildlife Services Program**.

(2) U.S. Fish and Wildlife Service Program

Depending on the States’ selection of management strategies, Service workload could vary widely under the “State Empowerment” alternative. In participating States, since most permits for resident Canada goose work would be eliminated (as decisions on management activities would fall to the State), a significant reduction in Service workload associated with resident Canada goose permits could occur.

There would likely be a significant reduction in workload associated with permits for geese at airports, depredating geese in agricultural areas, and for geese causing public health concerns. There would also be a significant reduction in workload associated with permits for nest and egg destruction and active management of resident Canada geese (aggressive harassment programs, trap and relocation programs, and food shelf programs). However, given that permits for resident Canada goose work is only a small overall percentage of the overall permit program, and permit costs vary widely between Regions, it is unlikely the Service would be able to redirect these operating funds. Further, requests for information and education programs and State assistance in establishing and conducting monitoring surveys for resident Canada geese would likely require additional funding.

Since most decisions concerning individual resident Canada goose management activities would fall to the respective State wildlife agency in those participating States, there would be a corresponding increase in the Service's role of population monitoring and program oversight (see section **IV.F.2.g. Costs of Management Program**). To ensure the long-term health and conservation of resident Canada goose populations, participating States would be required to develop and implement resident Canada goose population monitoring surveys (within Service established guidelines and Service review) and track all take resulting from authorized management actions. The initial surge in workload associated with assisting States to develop these surveys and review monitoring plans would be significantly reduced once the plans were in place.

In those nonparticipating States, most workload regarding resident Canada geese would be largely unaffected and similar to that discussed in section **IV.A.2.b.(2) U.S. Fish and Wildlife Service Program**.

(3) State Programs

Depending on the States' selection of management strategies, workload could vary widely under the "State Empowerment" alternative. In participating States, decisions regarding resident Canada goose management activities would fall to the State. Under the available depredation orders (Alternative E), there would likely be a significant reduction in State workload associated with requests for assistance and management activities for geese at airports, depredating geese in agricultural areas, geese causing public health concerns, and requests for nest and egg destruction. Active management of resident Canada geese (such as aggressive harassment programs, trap and relocation programs, and food shelf programs) would all be available to those participating States.

Since most decisions concerning individual resident Canada goose management activities would fall to the respective State wildlife agency in those participating States, to ensure the long-term health and conservation of resident Canada goose populations, participating States would be required to develop and implement resident Canada goose population monitoring surveys (within Service established guidelines and Service review) and report all take resulting from authorized management actions.

In those nonparticipating States, most workload regarding resident Canada geese would be largely unaffected and similar to that discussed in section **IV.A.2.b.(2) U.S. Fish and Wildlife Service Program**.

An analysis of scoping comments from State wildlife or resource agencies shows that, of the 18 States agencies that specifically expressed a preference on the alternatives presented during scoping, 9 endorsed

the “State Empowerment” alternative (identified at that time as the “Conservation Order” alternative). Furthermore, a closer look at those States either expressing no preference or preference for the “Depredation Order” alternative, shows that a number of States recommended allowing a variety of options and letting States decide which they preferred to use. Several stated that the more available tools at their disposal, the better they would be able to effectively deal with the various problems. For example, the Minnesota Department of Natural Resources stated,

“Clearly, one or two management techniques will not work in every situation, and Minnesota needs as many viable goose management options available to us as possible while, at the same time, minimizing unnecessary administrative procedures.”

The Atlantic Flyway Council stated,

“We recommend that a variety of options, including the general depredation order (Alternative F) be implemented, and let states decide which approach they prefer. The alternatives are not mutually exclusive, and states may differ in the extent to which they want certain activities regulated by the Service. States could develop guidelines or further regulate goose control activities where they have the authority and desire to do so. This approach provides maximum flexibility to the states, It is unlikely that any one single alternative will satisfy everyone.”

The New Jersey Division of Fish, Game, and Wildlife, in a theme reflected by several other States supporting a general depredation order, further stated,

“Recently, the USFWS has proposed issuance of one statewide resident goose control permit to state wildlife agencies, which could then make affected landowners sub-permittees. This is an unacceptable solution to resident goose problems. First, this plan does nothing to relieve the affected landowner of a burdensome permit process. It still requires them to apply for a permit, keep records and report on their activities.... This plan also transfers the six-figure cost of administering the permit program for this federal species to the states without compensation.”

We believe the “State Empowerment” alternative provides States the most flexibility to deal with resident Canada goose damage management activities. States are provided with a menu of available management options ranging from specific depredation orders dealing with airports, agriculture, public health, and nests and eggs, to increased hunting opportunities both inside and outside the Treaty frameworks. Thus, States are able to choose and implement only those specific programs they are either comfortable with, have experience with, or believe to be the best available option to deal with goose conflicts and populations in their respective States. For example, if a State decided to implement a nest and egg depredation order, an airport depredation order, an agricultural depredation order, a conservation season in August, and expanded hunting methods in September, it could do so.

Further, there is no Federal requirement in any of these management alternatives for the State to issue permits or subpermits to those allowed to conduct management activities. If a State wishes to keep detailed records of those allowed to conduct management activities or issue permits, it may do so. However, if a State merely wishes to grant, through an order of their choosing, a certain group of entities or individuals the authority to conduct resident goose damage management activities, it may also do so. The only Federal requirements, other than overall program restrictions, are to monitor the spring breeding population and annually report the number of geese (adults, gosling, nests, and eggs) taken within the State. These requirements are necessary in order to adequately assess population status and the effectiveness of management activities.

c. Social Values and Considerations

(1) Aesthetics

Depending on the State's selection of management strategies there would be a reduction in the numbers of resident Canada geese. While the overall number of viewing opportunities would likely remain unchanged, there would likely be fewer geese in each flock. Some localized reductions in resident Canada goose viewing opportunities could occur at or near airports, agricultural areas, and sites recommended by public health officials as public health threat areas as geese are removed. However, problems associated with large numbers of geese, i.e., droppings, feathers, etc. would also significantly decrease as goose populations decreased. Overall, in the long-term, some localized reductions in resident Canada goose numbers would occur, but viewing opportunities would still be readily available.

(2) Recreational Use of Impacted Areas

The impacts of resident Canada geese on recreational areas would be significantly reduced as urban and suburban birds are likely targeted for reduction efforts by States. Additionally, removal of birds could significantly lessen existing impacts and conflicts. However, there could be some possible increases in resident Canada goose numbers at any nonparticipating recreational areas, such as athletic fields, public swimming lakes, and parks, as aggressive hazing of birds at participating sites causes displacement of geese to other protected areas. In the long-term, conflicts would level off at reduced levels as populations are significantly reduced.

(3) Animal Rights and Humaneness

Under the "State Empowerment" alternative, impacts to animal rights and humaneness would be more significant than those discussed in section **IV.A.2.c.(3) Animal Rights and Humaneness** depending on the State's selection of management strategies. All current goose management activities would be continued, and in many cases, significantly expanded (such as removal of adults and goslings), especially in urban and suburban areas of conflict.

d. Economic Considerations

(1) Residential, Commercial, and Public Property

In urban and suburban areas, there would likely be a significant reduction in property conflicts as resident geese in these areas would likely be targeted by States for reduction efforts. At these sites, decreases in resident Canada goose populations could occur as aggressive hazing of birds causes displacement of geese to other protected areas. Additionally, removal of birds would significantly lessen impacts and conflicts. In the long-term, conflicts would level off at reduced levels as populations are significantly reduced.

(2) Agricultural Crops

Under the "State Empowerment" alternative, if a State chose to implement an Agricultural Depredation Order, impacts would be similar to those discussed in section **IV.E.3.b.(4)(b) Agricultural Crops** as aggressive hazing would likely cause emigration of birds to other areas. Under an Agricultural

Depredation Order, agricultural areas would see significant benefits as there would be significantly less resident Canada goose impacts at participating agricultural sites.

e. Human Safety

Under the “State Empowerment” alternative, if a State chose to implement an Airport Depredation Order, impacts would be similar to those discussed in section **IV.E.1.b.(5) Human Safety** as aggressive hazing of geese would likely cause emigration of birds to other areas. However, establishment of an Airport Depredation Order would significantly reduce the risk of goose-aircraft strikes at those airports participating in the depredation order and there would be significantly less resident Canada geese at airports.

Other human safety issues impacts would be less than that discussed in section **IV.A.2.e. Human Safety** with some possible increases in resident Canada goose numbers at non-participating sites around areas aggressively hazing birds. In the long-term, the combination of various goose management activities authorized by the alternative would result in not only localized reductions in resident Canada goose numbers, but overall goose population reductions, as well. These significant reductions would decrease the likelihood of other associated potential goose safety problems.

f. Human Health

Under the “State Empowerment” alternative, if a State chose to implement a Public Health Depredation Order, impacts would be similar to those discussed in section **IV.E.4.b.(6) Human Health**. Under this alternative, specific problem areas could be specifically addressed by public health officials. In the long-term, the combination of various goose management activities authorized by the alternative would result in not only localized reductions in resident Canada goose numbers, but overall goose population reductions, as well. These significant reductions would decrease the likelihood of other associated potential health problems areas.

Other human health impacts would be less than that discussed in section **IV.A.2.f. Human Health** with some possible increases in resident Canada goose numbers at non-participating sites around areas aggressively hazing birds.

g. Costs of Management Program

(1) Administrative Costs

As we discussed in section **IV.F.2.b.(1) Wildlife Services Program**, under the “State Empowerment” alternative, Wildlife Service’s workload would vary depending on the States’ selection of management strategies; thus, costs would also vary. In those States choosing to continue current operations and management, the Wildlife Service’s program and costs would be largely unaffected. In those States choosing to alter their current management to take advantage of conditions offered by the “State Empowerment” alternative, there would be a probable significant initial workload increase establishing non-lethal harassment programs and assisting in establishing and implementing other programs. In these States, Wildlife Services would see a significant initial increase in costs. However, once the States’ programs were established and goose conflicts lessened due to a smaller goose population, a subsequent reduction in Wildlife Services’ costs would likely result and resulting costs would be more operational

(i.e., equipment, supplies, and cooperators) in nature.

For the Service, as we discussed in section **IV.F.2.b.(2) U.S. Fish and Wildlife Service Program**, depending on the States' selection of management strategies, Service costs could vary widely under the "State Empowerment" alternative. In participating States, since most permits for resident Canada goose work would be eliminated (as implementation would fall to the State), a significant reduction in Service costs relating to resident Canada goose permit administration and review could occur. However, there would be a corresponding increase in the Service's role of population monitoring and program oversight. To ensure the long-term health and conservation of resident Canada goose populations, participating States would be required to develop and implement resident Canada goose population monitoring surveys and track all take resulting from authorized management actions (see section **IV.F.2.g.(2) Monitoring Costs** below). We estimate the initial surge in workload associated with assisting States develop these resident Canada goose breeding population surveys and review monitoring plans would be approximately \$50,000. Once the monitoring plans were in place and operational, Service survey-related costs would essentially disappear except for periodic review.

Depending on the States' selection of management strategies and how they choose to implement each selected strategy, State administrative costs could vary widely under the "State Empowerment" alternative. States are provided with a menu of available management options and are able to choose and implement only those specific programs they are either comfortable with, have experience with, or believe to be the best available option to deal with goose conflicts and populations in their respective States. In participating States, there could be significant reductions in costs for handling requests for assistance and management activities for geese at airports, depredating geese in agricultural areas, geese causing public health concerns, and requests for nest and egg destruction depending on the State's implementation process. For those States desiring to keep detailed records and issue permits to entities and individuals allowed to conduct damage management activities on resident Canada geese, administrative costs could be significant. However, a permit process would provide the highest level of management control. For those States desiring a less-burdensome administrative process and lower management control, such as issuing State regulations that implement a chosen strategy or merely authorize certain entities and individuals to conduct management activities, administrative costs (not including monitoring costs) should be minimal.

In those nonparticipating States, most costs regarding resident Canada geese would be largely unaffected and similar to that discussed in section **IV.A.2.g.(1) Administrative Costs**.

(2) Monitoring Costs

Under this alternative, monitoring would likely have to be significantly increased, especially for those participating States with resident Canada goose populations not currently monitored or not adequately monitored. As we discussed in section **III.B.6.b. Monitoring Costs**, States currently spend in excess of \$220,000 annually monitoring resident Canada goose breeding populations. For the most part, those States with significant numbers of resident Canada geese do an adequate job of surveying breeding geese. In the Mississippi Flyway, surveys of giant Canada geese were initiated in 1992 in Ohio and Michigan. By 1993, the pilot survey had expanded to seven States and one Province. The survey became operational in 1997.

To demonstrate the importance of spring breeding surveys, the 1992 Mississippi Flyway mid-winter

survey indicated a population of 1.2 million Canada geese and allocated 250,000 to the resident giant Canada goose population. However, the first extensive giant Canada goose breeding survey estimated a spring population of 710,000 birds. Thus, well-designed and regularly-conducted annual surveys are an invaluable tool for monitoring and evaluating not only population status, but the effectiveness of any regulatory program.

The Mississippi Flyway spent \$89,600 in operational costs and 106 staff-days conducting the giant Canada goose breeding population survey in 1999 (Moser 2000). The annual survey is conducted in early April to early May in States and Provinces of the Mississippi Flyway with spring giant Canada goose populations of at least 10,000 birds. The Atlantic Flyway annually conducts a waterfowl breeding pair survey in mid-April to early May that provides an index to the number of breeding pairs of resident Canada geese. In 1999, the States spent \$31,280 in operational costs and 347 staff-days conducting the survey.

We estimate that, based on the information compiled by Moser (2000), the average State resident Canada goose spring breeding population survey will cost approximately \$10,000 annually. Expanding this estimate to those States with both sufficient numbers of resident Canada geese to justify the expense of the survey and sufficient goose conflicts to warrant the added burden of program responsibility would result in an annual resident Canada goose survey expenditure of over \$300,000 nationwide. This estimate would not include any recordkeeping, reporting costs, equipment, or staff time. However, implementation of this alternative in those States with existing adequate survey programs would not necessarily result in any expenditure increases related to surveys.

The second part of an operational monitoring program required by Alternative F would be an accurate and reliable reporting system. While the spring breeding population surveys would be the most significant portion of any overall resident Canada goose monitoring plan, the impacts (i.e., resulting take) of any implemented goose damage management activities should also be monitored. The easiest and most cost-effective method for accomplishing this objective is through annual reporting. We do not envision this requirement being either overly burdensome or detailed, but merely sufficient on a State level to allow the Service to monitor and evaluate the cumulative Flyway effects of the various programs, especially when considered in conjunction with other programs such as annual hunting seasons.

(3) Other Costs

Under the “State Empowerment” alternative, most Federal permits for resident Canada goose damage management activities in participating States would be eliminated. As such, public costs related to Federal permit applications would be eliminated. Conflict abatement costs (described in section **III.B.6.b.(3) Other Costs**) should eventually be reduced as problem goose populations decrease.

G. ALTERNATIVE G - GENERAL DEPREDATION ORDER

1. Biological Impacts

a. Resident Canada Goose Populations

Impacts would be similar to that discussed in section **IV.F.1.a. Resident Canada Goose Populations**.

b. Natural Resources

See section **IV.F.1.b. Natural Resources**.

c. Other Wildlife Including Federally Protected Species

See section **IV.F.1.c. Other Wildlife Including Federally Protected Species**. However, the potential for unintentional take of protected species by those authorized to conduct resident Canada goose management activities is greater than that under Alternative F since most State program oversight is removed. Private individuals, entities, and State agencies could be directly authorized by the Service to conduct damage management actions.

2. Sociological Impacts

a. Sport Hunting

(1) Regular Hunting Seasons

Impacts would be similar to that discussed under “Alternative A” in section **IV.A.2.a.(1) Regular Hunting Seasons**, but at a slower rate of growth. There would be some reductions in hunting opportunities in suburban-related areas as goose populations decrease in these specific areas as a result of damage management activities. However, most non-hunting related goose population reductions would occur in areas already closed to hunting or with limited hunting opportunity.

(2) Special Hunting Seasons

Impacts would be similar to that discussed under “Alternative D” in section **IV.D.2.a.(1) Special Hunting Seasons**. There could be some reductions in hunting opportunities in suburban-related areas as goose populations decrease in these specific areas as a result of damage management activities. However, most non-hunting related goose population reductions would occur in areas already closed to hunting or with limited hunting opportunity.

b. Migratory Bird Permit Program

(1) Wildlife Services Program

Impacts would be similar to that discussed in section **IV.F.2.b.(1) Wildlife Services Program**.

(2) U.S. Fish and Wildlife Service Program

Impacts would be similar to that discussed in section **IV.F.2.b.(2) U.S. Fish and Wildlife Service Program**. However, the administration of the program would function much differently than under Alternative F. Under Alternative F, authority for implementation and responsibility would fall to the State wildlife agency to make primary decisions on resident Canada goose damage management activities and population reduction actions. Under Alternative G, these decisions would largely remain with the Service. States wishing to participate in the various programs would have to approach the Service for entry of entities and persons in their respective State for entry into the program. Persons and entities

authorized by the Service under the Depredation Order would not need to obtain authority from the State unless required to do so under State law. The State would not be responsible, or accountable, for any such Service-authorized action. Likewise, the State would also not serve as the primary manager as under Alternative F. Thus, while the Service would experience a significant reduction in permit workload, as almost all permits for resident Canada goose work would be eliminated, other Service program oversight functions would increase.

(3) State Programs

Impacts would be similar to that discussed in section **IV.F.2.b.(3) State Programs**. However, the administration of the program would function much differently than under Alternative F. Under Alternative F, authority for implementation and responsibility would fall to the State wildlife agency to make primary decisions on resident Canada goose damage management activities and population reduction actions. Under Alternative G, these decisions would largely remain with the Service, although States could be more restrictive. States wishing to participate in the various programs would have to approach the Service for entry of entities and persons in their respective State for entry into the program. Persons and entities authorized by the Service under the Depredation Order would not need to obtain authority from the State unless required to do so under State law. The State would not serve as the primary decision maker and manager as under Alternative F. Thus, the States would likely experience a significant reduction in permit recommendation and technical assistance workload.

The Ohio Division of Wildlife stated,

“We are uncomfortable with language in this alternative stating that “affected individuals” or “authorized persons” would be given implementation authority. This will usurp the Ohio Division of Wildlife’s statutory authority and is unacceptable. Population monitoring and tactic evaluation is required under this alternative; however, the state wildlife agencies are the most appropriate and capable entities to handle these tasks. Proper monitoring will only be accomplished if the activities of affected individuals are regulated and monitored by the state wildlife agencies. The states must maintain ultimate authority and responsibility for managing their resident goose populations and should be held accountable by the Service.”

Based on comments received during public scoping, we do not believe this is the best use of the States’ expertise, usurps States’ management responsibilities, removes management flexibility from the States, and most importantly removes damage management decisions from the local level.

c. Social Values and Considerations

(1) Aesthetics

Impacts would be similar to that discussed in section **IV.F.2.c.(1) Aesthetics**.

(2) Recreational Use of Impacted Areas

Impacts would be similar to that discussed in section **IV.F.2.c.(2) Recreational Use of Impacted Areas**.

(3) Animal Rights and Humaneness

Impacts would be similar to that discussed in section **IV.F.2.c.(3) Animal Rights and Humaneness**. However, with the general liberalizations afforded by the Depredation Order alternative, the possibility exists that some individuals would view this alternative as permission to kill resident Canada geese for any purpose, at any time, and using any method. While, this is not the intent of this alternative, the possibility exists.

d. Economic Considerations

(1) Residential, Commercial, and Public Property

Impacts would be similar to that discussed in section **IV.F.2.d.(1) Residential, Commercial, and Public Property**.

(2) Agricultural Crops

Impacts would be similar to that discussed in section **IV.F.2.d.(2) Agricultural Crops**.

e. Human Safety

Impacts would be similar to that discussed in section **IV.F.2.e. Human Safety**.

f. Human Health

Impacts would be similar to that discussed in section **IV.F.2.f. Human Health**.

g. Costs of Management Program

(1) Administrative Costs

For Wildlife Services, impacts would be similar to that discussed in section **IV.F.2.g.(1) Administrative Costs**.

For the Service, the administrative costs related to permits would significantly decrease since most permits for resident Canada goose work would be eliminated. Under Alternative G, persons and entities authorized by the Service under the Depredation Order would not need to obtain permits to perform management or control activities. Thus, while the Service would experience a significant reduction in permit workload costs for resident Canada geese, other Service program oversight functions would increase.

(2) Monitoring Costs

Impacts would be similar to that discussed in section **IV.F.2.g.(2) Monitoring Costs**, except that some primary responsibilities for monitoring costs such as reporting and recordkeeping would be shifted from the State to authorized individuals and entities.

(3) Other Costs

Impacts would be similar to that discussed in section **IV.F.2.g.(3) Other Costs**.

H. RELATIONSHIP TO LAWS AND POLICIES

1. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. The U. S. Environmental Protection Agency (EPA) is responsible for implementing and enforcing FIFRA. All pesticides used by the Wildlife Services program are registered with and regulated by the EPA and are used by Wildlife Services in compliance with labeling procedures and requirements. No toxicants are currently used or registered for use in managing geese or reducing goose damage. The repellents ReJeX-iT AG-36™ and FlightControl™ are registered for use in reducing goose damage to vegetation in some States.

2. Investigational New Animal Drug (INAD)

The drug alpha-chloralose (AC) has been used as a sedative for animals and is registered with the U.S. Food and Drug Administration (FDA) to capture waterfowl, coots, and pigeons. FDA approval for use under INAD (21 CFR, Part 511) authorized Wildlife Services to use the drug as a non-lethal form of capture. The drug can only be purchased from Wildlife Services.

3. National Historic Preservation Act (NHPA) of 1966, as amended

The National Historic Preservation Act (NHPA) of 1966, and its implementing regulations (36 CFR§800), requires Federal agencies to: 1) determine whether activities they propose constitute "undertakings" that can result in changes in the character or use of historic properties and, 2) if so, to evaluate the effects of such undertakings on such historic resources and consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate American Indian Tribes to determine whether they have concerns for traditional cultural properties in areas of these federal undertakings. Service and Wildlife Services actions on tribal lands are only conducted at the tribe's request and under signed agreement; thus, the tribes have control over any potential conflict with cultural resources on tribal properties. Activities, as described under the proposed action, do not cause ground disturbances, nor do they otherwise have the potential to significantly affect visual, audible, or atmospheric elements of historic properties and are thus not undertakings as defined by the NHPA. The proposed alternative could benefit historic properties if such properties were being damaged by geese. In those cases, the officials responsible for management of such properties would make the request and would select the methods to be used in their program. Harassment techniques that involve noise making could conceivably disturb users of historic properties if they were used at or in close proximity to such properties; however, it would be an exceedingly rare event for noise producing devices to be used in close proximity to such a property unless the resource being protected from goose damage was the property itself, in which case the primary effect would be beneficial. Also, the use of such devices is generally short term and could be discontinued if any conflicts with historic properties arose. We have determined that resident Canada goose management actions are not undertakings as defined by the NHPA because such actions do not

have the potential to result in changes in the character or use of historic properties. A copy of this DEIS has been provided to the Bureau of Indian Affairs to allow them an opportunity to express any concerns that might need to be addressed prior to a decision.

4. Environmental Justice

Executive Order 12898, entitled, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" promotes the fair treatment of people of all races, income levels and cultures with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Environmental justice is the pursuit of equal justice and protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. It is a priority within the Service and Wildlife Services. Executive Order 12898 requires Federal agencies to make environmental justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of federal programs, policies and activities on minority and low-income persons or populations.

The Service and Wildlife Services implement Executive Order 12898 principally through their compliance with NEPA. All activities are evaluated for their impact on the human environment and compliance with Executive Order 12898. Wildlife Services personnel use only legal, effective, and environmentally safe wildlife damage management methods, tools, and approaches. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations. In fact, providing processed goose meat products at no cost to food shelf operations within States will benefit and low-income persons or populations who receive services provided by such operations.

5. Protection of Children from Environmental Health and Safety Risks (Executive Order 13045)

Children may suffer disproportionately for many reasons from environmental health and safety risks, including the development of their physical and mental status. Because we make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, we have considered the impacts that this proposal might have on children. The proposed alternative would occur by using only legally available and approved methods where it is highly unlikely that children would be adversely affected. For these reasons, we conclude that it would not create an environmental health or safety risk to children from implementing this proposed action.

6. Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 requires agencies to assess the effects of Federal regulatory actions on State, local, and tribal governments and the private sector. The purpose of the act is to strengthen the partnership between the Federal government and State, local, and tribal governments and to end the imposition, in the absence of full consideration by Congress, of Federal mandates on these governments without adequate Federal funding, in a manner that may displace other essential governmental priorities. We have determined, in compliance with the requirements of the Unfunded Mandates Reform Act, 2 U.S.C. 1502 et seq., that the proposed action would not "significantly or uniquely" affect small governments, and will not produce a Federal mandate of \$100 million or more in any given year on local or State government or private entities. Therefore, this action is not a "significant regulatory action" under the Unfunded Mandates Reform Act.

7. Energy Effects - Executive Order 13211

On May 18, 2001, the President issued Executive Order 13211 on regulations that significantly affect energy supply, distribution, and use. Executive Order 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. As this proposed action is not expected to significantly affect energy supplies, distribution, or use, this proposed action is not a significant energy action and no Statement of Energy Effects is required.

8. Takings Implication Assessment

In accordance with Executive Order 12630, this proposed action does not have significant takings implications and does not affect any constitutionally protected property rights. This action will not result in the physical occupancy of property, the physical invasion of property, or the regulatory taking of any property. In fact, this proposed action will help alleviate private and public property damage and concerns related to public health and safety and allow the exercise of otherwise unavailable privileges.

9. Federalism Effects

Due to the migratory nature of certain species of birds, the Federal Government has been given statutory responsibility over these species by the Migratory Bird Treaty Act. While legally this responsibility rests solely with the Federal government, it is in the best interest of the migratory bird resource to work cooperatively with the Flyway Councils and States to develop and implement the various migratory bird management plans and strategies.

For example, in the establishment of migratory game bird hunting regulations, we annually prescribe frameworks from which the States make selections and employ guidelines to establish special regulations on Federal Indian reservations and ceded lands. This process preserves the ability of the States and Tribes to determine which seasons meet their individual needs. Any State or Tribe may be more restrictive than the Federal frameworks at any time. The frameworks are developed in a cooperative process with the States and the Flyway Councils. This allows States to participate in the development of frameworks from which they will make selections, thereby having an influence on their own regulations.

The DEIS's proposed alternative was developed following extensive input from the Flyway Councils, States, and Wildlife Services. Individual Flyway management plans were developed and approved by the four Flyway Councils (see section **I.E. Flyway Council Management Plans and Appendices 2- 5**). States actively participated in the scoping process (see **Appendix 8**).

This proposed action does not have a substantial direct effect on fiscal capacity, change the roles or responsibilities of Federal or State governments, or intrude on State policy or administration. The proposed alternative allows States the latitude to develop and implement their own resident Canada goose management action plan within the frameworks of the proposed alternative. Therefore, in accordance with Executive Order 13132, this proposed action does not have significant federalism effects and does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

10. Endangered Species Act Consideration

Section 7(a)(2) of the Endangered Species Act (ESA), as amended (16 U.S.C. 1531-1543; 87 Stat. 884) provides that “Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out *** is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat ***.” We have initiated Section 7 consultation under the ESA for this proposed action. The result of our consultation under Section 7 of the ESA will be available to the public. A list of endangered, threatened, proposed and candidate species is included in **Appendix 11**.

11. Government-to-Government Relationship with Tribes

In accordance with the President’s memorandum of April 29, 1994, “Government-to-Government Relations with Native American Tribal Governments” (59 FR 22951), E.O. 13175, and 512 DM 2, we have determined that this action has no effects on Federally recognized Indian tribes.

12. Regulatory Flexibility Act

The Regulatory Flexibility Act of 1980 (5 U.S.C. 601 et seq) requires the preparation of flexibility analyses for actions that will have a significant effect on a substantial number of small entities, which includes small businesses, organizations, or governmental jurisdictions. The economic impacts of our proposed alternative will fall primarily on State and local governments and Wildlife Services because of the structure of wildlife damage management. Data are not available to estimate the exact number of governments affected, but it is unlikely to be a substantial number on a national scale. We estimate that implementation of new resident Canada goose management regulations would help alleviate local public health and safety concerns, decrease economic damage caused by excessive numbers of geese, and increase the quality of life for those people experiencing goose conflicts. Implementation of new resident Canada goose regulations would also help reduce agricultural losses caused by these geese. Our proposed action is to implement Alternative F “State Empowerment”, which would give State fish and wildlife agencies significantly more latitude to manage resident Canada goose populations. If the proposed alternative is implemented, populations would be reduced to levels that local communities can support and agricultural damages will be reduced. We have determined that a Regulatory Flexibility Act analysis is not required.

13. Executive Order 12866

In accordance with the criteria in Executive Order 12866, this proposed action is not a significant regulatory action subject to Office of Management and Budget review. This rule will not have an annual economic effect of \$100 million or adversely affect any economic sector, productivity, competition, jobs, the environment, or other units of government. Therefore, a cost-benefit economic analysis is not required. This proposed action will not create inconsistencies with other agencies’ actions or otherwise interfere with an action taken or planned by another agency. The Federal agency most interested in this action is Wildlife Services. The action proposed is consistent with the policies and guidelines of other Department of the Interior bureaus. This proposed action will not materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients. This proposed action will not raise novel legal or policy issues because we have previously managed resident Canada geese under the Migratory Bird Treaty Act.

14. Migratory Bird Treaty Act

The Service has the primary statutory authority to manage migratory bird populations in the United States, authority which comes from the Migratory Bird Treaty Act (U.S.C. 703-711: 40 Stat. 755). The original treaty was signed by the U.S. and Great Britain (on behalf of Canada) in 1918 and imposed certain obligations on the U.S. for the conservation of migratory birds, including the responsibilities to: conserve and manage migratory birds internationally; sustain healthy migratory bird populations for consumptive and non-consumptive uses; and restore depleted populations of migratory birds. Conventions with Mexico, Japan, and Russia occurred in later years. The Act provides the Service regulatory authority to protect species of birds that migrate outside the United States. The law prohibits any “take” of the species, except as permitted by the Service. Regulations governing the take, capture, kill, possession, and transportation of migratory birds are authorized by the Migratory Bird Treaty Act and are promulgated in 50 CFR parts 13, 20, and 21.

In the past, several issues has arisen related to resident Canada goose population control and damage management activities. As an aid to the reader, we have attempted to readdress those issues here.

First, concern has been expressed that the Service does not have the authority under the Act to allow non-Service entities (i.e., States) to issue permits or permit damage management activities and that to do so is an abrogation of the Service’s goose-management responsibility. However, under the proposed action Alternative F - State Empowerment), we propose to utilize a process whereby permitted entities (i.e., State wildlife management agency employees, airports, public health officials, agricultural operators, etc., or their designated agents) could carry out resident Canada goose damage management and control injurious problems within the overall conditions/restrictions of the program. This new process is essentially no different than the current permitting process contained in 50 CFR part 21.

Further, many have expressed concern that the entire concept and definition of “resident” Canada geese is invalid and that the new program is merely a mechanism to remove Canada geese from the protection afforded them under the Migratory Bird Treaty (Treaty). On the contrary, data and other information included in this DEIS clearly demonstrates the impact of resident Canada goose populations on personal property, agricultural commodities, and health and human safety. Further, we are not redefining what is or is not a migratory bird under the Treaty. Canada geese are clearly protected by the Treaty and will continue to be under the proposed action. We are using the term “resident” to identify those commonly injurious Canada geese that will be the subject of management control activities within the scope of the Treaty.

Lastly, some believe the Treaty only authorizes the killing of migratory birds if they are seriously injurious to commercial interests, not personal property. Article VII of the Treaty states, “Permits to kill any of the above named birds, which under extraordinary conditions may become seriously injurious to the agricultural **or other interests in any particular community** (emphasis added), may be issued by the proper authorities ...”. We believe that resident Canada goose populations have reached this level. The information available to us as discussed in the DEIS, demonstrates that the current population levels are causing serious injury to increasing numbers of people and property. The Treaty does not limit the “interests” to be protected to those that are commercial. Rather, it provides the High Contracting Parties broad authority to address any affected interests.

Therefore, we believe that establishment and implementation of the proposed action (Alternative F - State Empowerment) is consistent with the provisions of the Act, the Service’s authority, and in

accordance with the terms of the Treaty. For further discussion see section **I.D.1. U.S. Fish and Wildlife Service**.

15. Animal Damage Control Act

The Wildlife Services program is directed by law to protect American agriculture and other resources from damage associated with wildlife. This DEIS and the proposed action (Alternative F - State Empowerment) is consistent with the provisions of Wildlife Service's authority and responsibilities. For further discussion see section **I.D.2. Wildlife Services, Animal and Plant Health Inspection Service, U.S. Department of Agriculture**.

16. National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321-4347)

NEPA is our basic national charter for protection of the environment; it requires Federal agencies to evaluate the potential environmental impacts when planning a major Federal action and ensures that environmental information is available to public officials and citizens before decisions are made and before actions are taken.

In general, the NEPA process entails: determining what need must be addressed; identifying alternative ways of meeting the need; analyzing the environmental impacts of each alternative; and deciding which alternative to pursue and how. While NEPA does not place environmental protection over all other public values, it does require a thorough consideration of the environmental impacts associated with management actions. NEPA neither requires a particular outcome nor that the "environmentally-best" alternative is selected. It mandates a process for thoroughly considering what an action may do to the human environment and how any adverse impacts can be mitigated (<http://npi.org/nepa/process.html>).

More specifically, there are seven major steps in the planning process for the development of an EIS and the implementation of the proposed action. These include:

Publication of Notice of Intent – The Notice of Intent to prepare an Environmental Impact Statement on resident Canada goose management was published in the Federal Register (64 FR 45269) on August 19, 1999 (see **Appendix 6**). This initiated the scoping process.

Identification of Issues and Concerns – The Notice of Intent solicited public participation in the scoping process, which is the chief way that issues, concerns, and potential management options are communicated from the public to the lead agency. In addition to writing or e-mailing comments, citizens could attend any of nine public meetings held across the country. These meetings were publicized in a December 30, 1999 Federal Register (64 FR 73570) (see **Appendix 7**). The scoping period ended on March 30, 2000. All comments were read, compiled, and summarized in a public scoping report (see **Appendix 8**).

Development of Alternatives – Following scoping, seven alternatives were developed to offer a range of options for managing resident Canada geese. These were based on NEPA regulations, public comments, interagency meetings, internal discussion, and review of available scientific information.

Analysis of Environmental Effects – After significant issues and alternatives were established, the environmental analysis was prepared in order to help the public and decision-makers understand the

environmental consequences of the various alternatives.

Publication of Notice of Availability of Draft Environmental Impact Statement – This Federal Register publication announces the completion of the DEIS and its availability for public review. It is typically followed by a 60-day comment period during which several public meetings are held.

Publication of Notice of Availability of Final Environmental Impact Statement – This Federal Register publication follows the public comment period for the DEIS and announces the completion of the Final EIS, followed by a 30-day waiting period.

Publication of Record of Decision and National Management Plan – This is the final step of the EIS decision-making process, which states the selected alternative and why it was chosen. The actions associated with the EIS cannot be taken until the Record of Decision is issued.

17. Executive Order 13186

Executive Order 13186, entitled “Responsibilities of Federal Agencies to Protect Migratory Birds,” directs any Federal agency whose actions have a measurable negative impact on migratory bird populations to develop a memorandum of understanding with the Fish and Wildlife Service to promote conservation of migratory birds. The MOUs would establish protocols to guide future agency regulatory actions and policy decisions; renewal of permits, contracts or other agreements; and the creation of or revisions to land management plans. The Executive Order also requires the Secretary of Interior to establish a Council for the Conservation of Migratory Birds to oversee implementation of the Executive Order. The council will be composed of representatives from the Department of Interior; the Departments of Commerce, Agriculture, State, Transportation, Energy, and Defense; the Environmental Protection Agency; and other agencies as appropriate.

I. UNAVOIDABLE ADVERSE IMPACTS

Some unavoidable adverse environmental impacts are likely to occur from implementation of the proposed action, Alternative F - “State Empowerment.” There will be both localized and Flyway-wide adverse impacts on resident Canada goose populations where lethal population and damage management methods are used by authorized States. Many individual Canada geese will be killed each year, and resident Canada goose populations will be purposely reduced under Alternative F. In addition to the impacts on the resident Canada goose populations, there will be adverse impacts to those people and organizations that consider lethal control inhumane or unnecessary. Further, Federal, State, local, and individual dollars will be expended annually to implement the proposed program, and despite program efforts to minimize property losses from resident Canada geese, economic losses will continue into the future.

J. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The criteria for implementing NEPA require that any irreversible and irretrievable commitment of resources by a proposed action be included in the DEIS. Because the proposed action deals with wildlife, a renewable resource, the effects of the proposed action are not irreversible or irretrievable. No

construction or other major commitment of resources is part of the proposed action.

K. CUMULATIVE IMPACTS

Cumulative impacts are impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. **Table V-1** provides a comparison of impacts of the alternatives considered.

Under the “No Action” alternative, we expect resident Canada goose population increases to continue, conflicts with human activities to worsen, and property damage to expand into new areas. These population increases will continue to occur despite recent efforts to increase sport harvest, the increased issuance of permits, and the special Canada goose permit. Cumulative impacts to natural resources, especially in those areas already experiencing moderate to excessive damage, would increase as the degree of damage increases with higher populations of geese and their associated activities. Repeated, and almost year-round, incidences of resident Canada goose damage to agricultural crops and personal property may reach the point where farmers and other property owners demand compensation for financial losses. Growing conflicts with property, people and their activities will lessen the social value and consideration afforded Canada geese, and considerable safety concerns will continue to grow in stature and importance as the potential for goose-aircraft collisions increases. Federal and State workload related to responding to and handling resident Canada goose conflicts would be expected to continue increasing and begin to affect other resource program areas as additional financial resources are directed to dealing with goose conflicts. Over time, we expect that cumulative impacts will become more evident, prevalent, and significant as the goose populations continue to grow nationwide.

Cumulative impacts also would occur if the “No Action” approach were adopted in situations where other wildlife species have become overabundant. For example, light goose (snow geese and Ross’s geese) population increases continue to cause severe damage to Arctic and subarctic habitats. These cumulative impacts to habitats, especially in sensitive tundra habitats, will be more persistent as the degree of damage increases with repeated exposure to goose feeding activities. Further, higher light goose populations increase the likelihood of disease outbreaks that would impact light geese as well as other susceptible species. Continued inaction for all situations where wildlife has become overabundant would likely cause significant cumulative impacts to habitats and conflicts with human activities would increase.

Under the proposed action, we expect that the use of resident Canada goose control and management activities, particularly lethal control methods would increase significantly. Lethal control methods associated with aggressive hazing techniques of adult birds would also be expected to increase. Such lethal and nonlethal activities would be expected to significantly decrease the number of injurious resident Canada geese in specific localized areas, especially urban/suburban areas. Expanded hunting opportunities, both inside and outside the Treaty frameworks, would help decrease populations on a more regional and statewide scale, compared to site-specific management activities. Regionally and nationally, we expect resident Canada goose populations would return to levels that we, the Flyway Councils, and the States believe are more compatible with human activities, especially in those high-conflict areas related to public health and safety, agricultural depredation, and urban and suburban areas. The long-term viability of goose populations would not be affected, however. The cumulative impacts to human activities and personal property would be that the rate of damage and conflicts from resident Canada

geese would be either stabilized, slowed ,or reversed depending on the State’s selection of management strategies. Federal and State workload related to responding to and handling resident Canada goose conflicts would be expected to decrease as populations decrease. Over time, we expect that cumulative impacts will become more less evident and significant as the goose populations are reduced.

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