

Re: Biological Opinion Manchester Airport Access Road,
Hillsborough County, New Hampshire

January 3, 2002

Mr. Walter C. Waidelich
Assistant Division Administrator
U.S. Department of Transportation
Federal Highway Administration
279 Pleasant Street, Suite 204
Concord, New Hampshire 03301- 7502
Attn: William F. O'Donnell

Dear Mr. Waidelich:

The U.S. Fish and Wildlife Service (Service) has reviewed the Manchester Airport Access Road project, DPR-F-047(1), 11512 and associated Bald Eagle Biological Assessment (dated August 2001), issued jointly by your office and the New Hampshire Department of Transportation (NHDOT). Your August 14, 2001 request for formal consultation was received on August 15, 2001. This document represents the Service's biological opinion, in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 661 et seq.), on the effects of the proposed action on the bald eagle (*Haliaeetus leucocephalus*), a federally-threatened species. A complete administrative record of this consultation is on file in this office.

I. CONSULTATION HISTORY

The consultation history is provided in Appendix A.

II. BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The proposed project will provide new vehicular access to the Manchester Airport by constructing 3.2 km (2 miles) of new highway and a bridge across the Merrimack River connecting the airport with the F.E. Everett Turnpike in Bedford. In addition to providing new access to the airport, the highway will also improve access to 1,200 acres of undeveloped industrially-zoned land south of the airport in Londonderry (Final Environmental Impact Statement 2001).

As reported in the Final Environmental Impact Statement (FEIS) and August 2001 Biological Assessment, the Federal Highway Administration (FHWA) and the NHDOT (hereafter referred to as the transportation agencies) evaluated 13 alternatives and identified CG-Modified Shift as the selected alternative. CG-Modified Shift is a divided, limited access, four-lane facility (two lanes in each direction) that will begin at the F.E. Everett Turnpike in Bedford and extend easterly over the Merrimack River before turning north and entering the airport from the south. Interchanges, connector roads and on- and off-ramps will also connect the new roadway to US Route 3 and NH Route 3A. In addition to bridging the Merrimack River, the new access road will also cross over the Heritage (pedestrian) Trail and the NH Main Line railroad. Concurrent with and adjacent to the new roadway, a parallel bike/pedestrian trail will also be constructed across the NH Main Line railroad and Merrimack River.

The project study area is contained within the watershed of the Merrimack River. Tributary streams within the project area include Cohas Brook, Little Cohas Brook, Sebbins Brook, Watts Brook and Upper Beaver Brook (FEIS 2001).

As a result of the project, approximately $100 \pm$ acres of upland forest and other terrestrial habitat will be destroyed. In addition, $12 \pm$ acres of wetlands (including 3.3 acres of riparian forest) and 1.3 acres of the Merrimack River will be overtopped by the new bridge and roadway.

As compensation for fish and wildlife habitat that will be destroyed or degraded, a total of $760 \pm$ acres will be acquired for preservation, about 27 acres of which is riparian habitat of value to eagles. Mitigation for adversely impacting wetlands and other fish and wildlife habitat is expected to cost \$3.7 million and is described in detail in the FEIS and Biological Assessment.

Dollar cost estimates to construct the proposed action range from 58.3 million, 1997 reference year (Table 2.9-1 FEIS 2001) to more than 75 million (Robert Barry, NHDOT, pers. comm., April 2001). Project construction will take approximately three years, and is anticipated to begin in 2004 (Mr. Greer, NHDOT, Manchester Union Leader, September 26, 2001).

Multiple federal actions provide the basis for this consultation, including project funding which is about 80% federal highway dollars. In addition, this project was subjected to regulatory review by the New England District, U.S. Army Corps of Engineers (COE) for compliance with Section 404 of the Clean Water Act (CWA). COE review focused on impacts to aquatic and wetland habitats within the CG-Modified Shift right-of-way. A National Pollution Discharge Elimination System permit from the U.S. Environmental Protection Agency will also be required.

The location of the selected alignment for a new bridge and roadway, CG-Modified Shift, was revised between March and June 2001 after the discovery of a pair of adult bald eagles that had initiated nest construction in Bedford about 400 feet north of the FEIS selected alternative. The discovery of the new nest resulted in additional informal consultation among this office, the New Hampshire Fish and Game Department and the transportation agencies. The Service requested that the construction of any new bridge/roadway be consistent to the maximum extent possible with national guidelines for management of bald eagle nesting areas. These guidelines recommend that “land-use activities that result in significant changes in the landscape, such as clear cutting, land clearing, or major construction, should be prohibited...within 660 feet of the nest” (USFWS Northern States Bald Eagle Recovery Plan 1983). Accordingly, the transportation agencies altered the alignment of CG-Modified Shift in the vicinity of the proposed bridge, by moving it approximately 320 feet farther to the south. The new alignment, Revised CG-Modified Shift, is approximately 700 feet south of the eagle nest at its closest point.

Conservation Measures

Conservation measures are actions that an agency (or applicant) pledges to implement and are important because they will further the recovery of a threatened or endangered species. Furthermore, conservation actions that are included within a project’s description can be taken into consideration when determining whether a project is likely to jeopardize a species or result in the incidental take of individuals. **Conservation measures are part of the proposed action and their implementation is required under the terms of the consultation.**

Through the course of informal consultation on this project, the transportation agencies have modified the project description to include the following conservation measures:

1. The alignment of CG-Modified Shift was revised to maintain a 660-foot, no construction/land alteration buffer zone around the eagle nest in Bedford.
2. Best management practices will be implemented to maintain existing water quality within the Merrimack River.
3. Clearing of riparian forest within and adjacent to the right-of-way in Bedford will be minimized and no land clearing beyond that needed for construction as shown in Figure 5 of the Biological Assessment (copy attached) will occur within the tertiary buffer zone (from 660 feet -1320 feet from the nest) to establish contractor(s) staging areas.
4. Seasonal restrictions on construction and related activities near nesting bald eagles recommended in the Northern States Bald Eagle Recovery Plan (1983) will be implemented (with exceptions as noted on page 23 of the Biological Assessment).

5. The following parcels will be acquired:
 - a 10.5-acre tract which includes two known roost trees within the Sebbins Brook area;
 - a 13.1-acre tract in Bedford and a 3.5-acre tract in Manchester.

Together, these parcels protect approximately 1.0 mile of undeveloped river bank in Bedford and Manchester including the nest tree, two known roost trees, and six potential roost trees within the peninsula area (Biological Assessment August 2001).

6. The transportation agencies shall pursue arm's-length negotiation¹ with the NH Mainline railroad to secure protection of an 8.0-acre tract of riparian forest on the west river bank across from the rock outcrop/Devon Street area. This tract contains two known roost trees and several perch trees.
7. Ownership and/or management of the above parcels will be transferred to the New Hampshire Fish and Game Department.
8. The transportation agencies will implement an eagle conservation and management plan as described on page 26 of the Biological Assessment.

The transportation agencies have agreed that acquisition of title, or conservation easements on the above parcels (with the exception of the NH Mainline tract) shall be completed **prior** to the letting of any contracts for construction. Further, the transportation agencies are committed to implementing the conservation measures listed above despite the possible future removal of the bald eagle from the federal threatened species list (Robert Barry DOT, William O'Donnell, FHWA, pers. comm., November 2001).

LIFE HISTORY and RANGE WIDE STATUS

With a wingspan of 6.5 feet, the bald eagle is one of the largest birds of prey in North America. It is often found near large bodies of water and is associated with shoreline habitats near estuaries, rivers and lakes. Adult eagles are easily recognized by their distinctive white head and tail feathers. Juvenile birds are dark brown during their first year of life, transitioning into a mottled brown plumage. The fully capped white head appears at sexual maturity, usually at age four to five. The diet of the bald eagle during spring and summer consists largely of fish, and other prey such as small mammals and fresh water turtles. During winter months bald eagles adapt to seasonal changes in prey availability, and will consume more waterfowl and carrion.

For foraging and nesting, eagles generally prefer undisturbed forested habitats away from human development and associated activities. Eagles generally avoid areas of human activity (Fraser et al. 1985, Chandler et al. 1995). The tree selected for nest construction usually extends above the forest canopy, and

¹ Acquisition not subject to eminent domain.

is within a mile distance to water. In the Chesapeake Bay region, eagles prefer live trees such as loblolly pine (70%) but will select deciduous trees as well. Tulip poplar, American beech, white and red oak, and Virginia pine are regularly used by eagles in the mid-Atlantic states. In the northeastern United States, eastern white pine, cottonwood, white ash, maples and oaks have all been used. Large sticks are placed near the top of the nest tree, usually at a height of about 90 feet. The nest is circular to oval in shape and averages 3 to 4 feet deep by 5 feet across.

Adult eagles mate for life, establishing nesting territories that they return to each year. The same nest may be used year after year, but it is also common for a breeding area to contain one or more alternate nests. Nesting pairs may remain near their territory year round, especially if nearby lakes and rivers remain ice-free during winter. In New England, nest building and repair usually begin in January and February. The one-to-three-egg clutch is laid in March or April. Most eggs hatch between late April and May and eaglets remain in the nest for 11 to 12 weeks. Eggs and young within the first two-three weeks of hatching are highly susceptible to cold, wind-chill or even death as a result of heat loss, which may occur if adults are disturbed from the nest for prolonged periods. By mid-to-late July, eaglets are fully feathered and will take their first flights away from the nest. In the next several weeks they will become more proficient flyers but remain dependent on the parents for food for a period of 4-11 weeks after fledging (Wood, Collopy and Sekerak 1998). At this time, both young and adults may wander away from the nesting territory to other foraging areas.

Bald eagles are long lived. The oldest bald eagle known in the wild was reported near Haines, Alaska; it was 28 years of age (Schempf 1997). In captivity, eagles may live 40 years or more.

The bald eagle once ranged throughout the United States except Hawaii. When America adopted the bird as its national symbol in 1782, as many as 100,000 nesting bald eagles lived in the continental United States south of Alaska. In the late 1940s eagle numbers were dramatically reduced as a result of the use of the chemical insecticide DDT. DDT was widely used in crop management, forest pest control and mosquito abatement. By the late 1960s, breeding populations of predatory birds, such as peregrine falcons, ospreys and bald eagles had been decimated through eggshell thinning and reproductive impairment (Wiemeyer et al. 1984). Other factors contributing to the eagle's decline included human disturbance at nest sites, habitat loss, and shooting (Palmer 1988). By 1963, a nationwide survey by the National Audubon Society revealed that only 417 nesting pairs could be found in the lower 48 states.

In 1978, the bald eagle was listed pursuant to the ESA as an endangered species in 43 of the contiguous United States, and as a threatened species in the remaining five states (USFWS 1979). The bald eagle is listed as an endangered species under New Hampshire law (RSA 212.A). The eagle is similarly listed by state statute as either threatened or endangered in each of the other New England states.

Since the nationwide ban of DDT and other chlorinated hydrocarbon pesticides by the Environmental Protection Agency on December 31, 1972, the population of eagles in the northeastern United States, as well as the nation as a whole, has slowly but steadily increased. In New England, the number of territorial

nesting pairs increased from a nadir of 27 occupied sites in 1962 in Maine, the only New

England state where nesting eagles persisted, to 295 territorial pairs in four New England states in 2001 (Maine, Massachusetts, New Hampshire and Connecticut).

Nationally, recovery of the bald eagle has been equally dramatic. In 2001, approximately 6,350 occupied territories are reported (Jody Millar, USFWS Bald Eagle Recovery Coordinator, pers. comm., September 2001).

To organize regional recovery planning for a widely distributed species like the bald eagle, the Service grouped populations into five distinct recovery regions: Chesapeake Bay, Pacific, Southeast, Northern and Southwest. Separate recovery plans were developed for each population and individual recovery goals were set within each plan. The state of New Hampshire is within the Northern States Recovery Region. The best estimate currently available for the number of occupied territories within the Northern States Recovery Region is 2,552 for the year 2000.

On August 11, 1995, all bald eagle populations in the lower 48 states were reclassified from endangered to threatened due to significant increases in the number of breeding pairs, breeding distribution and nesting productivity (Federal Register vol. 60, no. 133). Subsequently, on the strength of data indicating that recovery was continuing, the Service proposed to delist the bald eagle on July 6, 1999 (Federal Register vol. 64, no. 128). However, a final decision has not been published due to the pending review of the many public comments received on the proposal to delist, and to the fact that issues related to the degree of protection that will remain in place under the Bald Eagle Protection Act of 1940 (16 U.S.C. 668) have not been resolved.

Threats to the Species

Threats to eagles can take many forms and include long-term habitat loss, direct mortality from shooting or electrocution, or reduced reproduction from environmental contaminants or disturbance. Interactions between humans and bald eagles during the breeding season occur throughout most of the eagle's range and can be detrimental to reproductive success (Fyfe and Olendorff 1976; Fraser 1985). In an eagle study in north central Michigan, bald eagles showed the greatest adverse response to pedestrian and vehicle movement. Boat traffic elicited the second highest response followed by aircraft activity (Grubb et al. 1992). Grubb et al. (1992) determined that in 75% of these interactions, eagles reacted at 500 meters and initiated flight responses at 200 meters.

As in other parts of the United States, habitat loss in the relatively densely populated eastern states remains an important threat to bald eagles. A large percentage of eagle nests (along shorelines of lakes, rivers and the coast) occurs on private property, and land and water development projects continue to impact nesting and foraging eagles. Therres et al. (1993) concluded that "the distance of the development activity to the nest may be more critical during the land clearing phase than during construction." In a Maryland case study, nests were abandoned up to 1,200 feet (366 m) from clearing operations while house construction was tolerated as close as 260 feet (79 m) in several cases. Nest abandonments occurred most often at

locations where there was a direct line-of-sight between the eagles' nest and the activity (i.e., lack of a wooded visual buffer).

Since the nationwide ban on the use of DDT and other toxic chemicals by EPA, bald eagle poisonings have been reduced significantly. However, isolated cases of eagle poisonings continue to be reported (Steve Olberholtzer, FWS, per. comm., 1999). Other threats, such as oil spills by water transport vessels, have the potential to contaminate fish and other aquatic prey. Power and electric companies continue to modify utility and transmission lines to further reduce electrocutions to eagles. In New England, several eagles are known to have died of electrocution at power lines in the past decade.

ENVIRONMENTAL BASELINE

The environmental baseline is a summary of the status and health of the species and/or its habitat in the area affected by the proposed action. As defined in 50 CFR 402.02, "action" means all activities or programs of any kind that are authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas. The "action area" is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. The direct and indirect effects of the actions and activities resulting from the federal action must be considered in conjunction with the effects of other past and present federal, state, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area.

Description of the Action Area - The Service concurs that the action area for this project is that described within the Biological Assessment. It encompasses the Merrimack River corridor from the I-293/NH Route 101 bridge on the north to about 1,500 feet south of the Bedford/Merrimack town line and from 1,000 feet west of the F.E. Everett Turnpike to 2,000 feet east of NH Route 3A. However, as the project has the dual purpose of improving highway access to the Manchester Airport and to undeveloped, industrially-zoned land south of the airport, indirect and cumulative effects will occur over a greater area of the lower Merrimack River corridor than that described above. Because the proposed action is considered essential to the growth and expansion of the Manchester Airport, and will contribute to increased enplanements and air traffic, the action area also includes the airspace over the Merrimack River corridor.

Status of the Species in the Action Area - Historical accounts provide scant detail regarding bald eagle occurrence in New Hampshire. It is likely, however, that eagles wintered on the lower Merrimack River well before European settlement, and one or more pairs probably nested in the area before the salmon and shad fisheries were destroyed by downstream dams in the 1800s [Carol Foss, Audubon Society of New Hampshire (ASNH), *in litt.*, October 1990].

Currently, bald eagles again utilize the action area as wintering habitat and as nesting (breeding) habitat. Wintering bald eagle use of the Merrimack River has been well established through direct and coordinated volunteer-based surveys ongoing since about 1980 (Audubon Society of New Hampshire 2001). Together with Great Bay, the Connecticut River, and the Lakes Region, the Merrimack River (from Franklin south to the Massachusetts border) is one of the most important areas for eagles wintering in the state (Tables 1a and b).

Table 1a. Estimated Number of Bald Eagles Wintering in New Hampshire, 1999/2000 (data compiled by ASNH).

Region	Adults	Subadults	Immatures	Total
Androscoggin River	4		2	6
Connecticut River	9		5	14
Great Bay	4	2	4	10
Lakes Region	5	3	2	10
Merrimack River	6	2	2	10
Other Areas	7		1	8
Total	35	7	16	58

Table 1b. Estimated Number of Bald Eagles Wintering in New Hampshire, 2000/2001 (data compiled by ASNH).

Region	Adults	Subadults	Immatures	Total
Androscoggin River	3	2	1	6
Connecticut River	8	1	5	14
Great Bay	5	1	7	13
Lakes Region	4	1	4	9
Merrimack River	5	1	2	8
Other Areas	4		3	7
Total	29	6	22	57

Wintering eagle habitat consists of places near water where the birds can feed, perch and rest during the day, and roost at night in shelter from prevailing winds and inclement weather. In addition to the physical attributes of wintering habitat (places to feed, rest, and shelter), eagles also require sanctuary from human disturbance. Energy conservation is critical to wintering eagles and birds that are frequently flushed from preferred perches or roosts may not be able to balance their caloric needs with energy expended.

Within the Merrimack River Manchester Airport project area, several areas important to wintering eagles are known. These include the riffle area immediately downstream of the I-293/Route101 bridge, Moore's Crossing, Devon Street rock outcrop, and the so-called peninsula area south to the mouth of Sebbins

Brook. As noted in the Biological Assessment, during the early-to-mid-1990s, the wintering eagle population in the lower Merrimack River numbered about 10 individuals, with the total number of eagles varying over the course of a winter from 12 to about 20 different birds (Cook et al. 1997).

As noted previously, between late January and mid-March 2001, an adult pair of bald eagles established a nest in the project area in Bedford, NH. While the pair cooperatively built a stick nest and were observed mating on several occasions, they did not actually nest (lay eggs) in 2001. As is often the case with eagle pairs just establishing a new breeding site, pair bond formation and nest construction are the primary activities the first year of territory occupancy. The eagle pair in Bedford was one of eight known adult eagle pairs recorded in New Hampshire during the spring and summer in 2001 and one of six pairs that constructed or occupied a nest (Christian Martin, ASNH, *in litt.*, October 2001).

The fact that a pair has established a nesting territory at a location that was heretofore known only as a wintering area highlights the importance of protecting wintering habitat. The expansion of bald eagle breeding distribution through territorial/nest establishment within traditional wintering areas is a trend reported for the other lower 48 states as well (Peter Nye, New York, Dept. of Environmental Conservation, pers. comm.; Jody Millar, USFWS, National Bald Eagle Recovery Coordinator, *in litt.* August 2001).

EFFECTS OF THE ACTION

This section provides an analysis of the direct and indirect effects of the project on the bald eagle and its critical habitat. Since critical habitat for the bald eagle has not been formally designated pursuant to Section 4 of the ESA, none will be affected.

The August 2001 bald eagle Biological Assessment (pages 15-27) discusses the direct, indirect, interrelated, and cumulative effects of implementing the proposed action on bald eagle perching, roosting, foraging and nesting habitat. Since the Biological Assessment contains this analysis in more than adequate detail, and is well referenced with citations of the appropriate scientific literature, it will not be repeated here. Rather, the following briefly summarizes what the Service believes are the most important effects of the proposed action on the bald eagle.

Human Disturbance During Construction

The operation of heavy equipment, the use of explosives and power tools, and a variety of other associated human construction activities are expected to have adverse effects on eagles in the immediate Merrimack River project area. Studies on bald eagle response to human activity near nesting, foraging and wintering locations cite a range of possible reactions to disturbances, typically measured as the distance from the stimulus that results in eagle flight. Many factors, including age of the bird, time of year, nature and intensity of the disturbance, degree of visual screening, and others may influence response distance and intensity (Stalmaster and Newman 1978; Grubb and King 1991). Still other studies suggest that eagles may be

highly tolerant of human activity at preferred feeding sites (Steenhof 1976).

In an ongoing Florida study by Millsap et al. (2000), eagle pairs that establish nest sites in close proximity to human habitations and disturbance (so-called suburban nests) are being studied to determine if their fecundity or survival rates differ from rural nesting eagle pairs. In a 1999-2000 progress report, the authors reported no differences in occupancy, productivity or success rate among the two groups. For the many reasons cited above, generalizations of the effects of disturbance on eagles are problematical.

The reason eagles avoid areas inhabited by people remains unknown (Buehler et al. 1991). Notwithstanding, it is widely accepted that most eagles avoid developed and human-used habitats. Therefore, it is expected that both the nesting pair and other eagles wintering in the project area will avoid the immediate bridge area during construction (about two years) and for some unknown time thereafter. How large of a displacement zone the new bridge will create within the river and riparian corridor is unknown.² However, the riparian habitat that is cleared (about 3.3 acres) and the displacement zone will be essentially lost to them, resulting in reduced feeding, perching and roosting opportunities. Some habitat "recovery" may occur in the future if eagles become habituated to the structure, and the new vehicle and pedestrian use within the river corridor.

Although no human disturbance will occur within 660 feet of the nest site, the eagles will have an unobstructed view of the bridge from their nest as it is being constructed. Once in place, an eagle's view of the river will be permanently, albeit partially obstructed by the new bridge.

It is not known whether the birds will continue to use the present nest after land clearing and bridge construction activities are initiated. If the birds are intolerant of the construction, then several outcomes are possible: 1) the birds will not nest (no eggs laid) the year construction is initiated; 2) the birds will abandon the nest after their tolerance threshold is exceeded and the young or eggs will be lost; or 3) the birds will abandon the present nest and initiate nest building at another nearby site. Successful nesting in that season is unlikely, resulting in the loss of at least one year's productivity.

Effects on Night Roosts

In addition to the nest site, overnight roost sites also occur in the action area on the peninsula and near the mouth of Sebbins Brook. The proposed bridge will pass between these roost sites. Moreover, vegetation clearing will take place within 650 feet of the peninsula roost and within 400 feet of the Sebbins Brook roost. Forest cover reduction and land clearing will expose these sites to northern and westerly winds, reducing the sheltering value of the roost sites to wintering eagles. Encroachment on these roosting locations by a major construction project, and ultimately by a new highway and bridge, may render them unsuitable for future use by eagles. Stalmaster and Newman (1978) suggest that only immature or juvenile birds may use habitats so altered by human activity.

² Because bald eagles currently use trees within 200 feet of the I-293/Route 101 bridge, the long-term displacement zone is anticipated to be relatively small.

Interrelated and Interdependent Actions

Interrelated activities are those that are part of the proposed action and depend on the proposed action for justification. Interdependent actions are those that have no separate utility apart from the proposed action.

As the new bridge will also include a pedestrian walkway (proposed for the north side of the structure), the eagles will also have direct line of sight with regard to people and bicyclists crossing the river. Another aspect of the proposed action is the construction of a car-top boat/canoe public access point on the river in Manchester approximately 800 feet south of the nest tree.

It is uncertain whether pedestrians on the bridge or people launching non-motorized boats at this distance from the nest will affect the birds. The eagles that built the nest in 2001 appear somewhat tolerant of human presence as the nest tree is less than 600 feet from the Hazleton Court residential subdivision diagonally across the river in Manchester. If boaters paddle upcurrent from the access point to below the nest they are likely to disturb the birds. Certainly use of the facility by pedestrians and boaters during the winter will displace wintering birds from the immediate area. As the proposed boat launch will come under the management of the New Hampshire Fish and Game Department, the Service believes that use of the facility will be managed in a manner that avoids disturbance to the birds.

Possibility of Direct Mortality

Bald eagles nesting in Bedford can be expected to make numerous flights from the nest each day in search of food. Based on eagle flight behavior at the I-293/Route 101 bridge, the birds are more apt to fly over the new bridge in Bedford than to pass under it. This is particularly so given the height of the nest compared to the height of the new structure. Virtually every flight from the nest that the eagles take to the south will bring them into a possible collision hazard with motor vehicles. A remote possibility also exists that eagles wintering or transient in the area will collide with a vehicle on the new bridge. Approximately 31,000 vehicle trips per day are anticipated to utilize the new bridge and roadway by the year 2015 (W. O'Donnell, FHWA *in litt.* October 2001).

Cumulative Effects

Cumulative effects are those that result from future state, local or private actions that are reasonably certain to occur in the action area.

Completion of the proposed project will result in improved access to Manchester Airport. In addition to facilitating the continued growth and expansion of the airport, the surrounding area is also likely to see rapid development, resulting in increased human population density in the lower Merrimack River corridor. Development will affect remaining wildlife habitats important to eagles in two ways: riparian forest used by

eagles will be lost or encroached upon, and other habitats supporting wildlife species that contribute to an eagle's forage base will be lost. In addition, the greater the human population density in the river corridor, the more difficult it will be for eagles to find secluded riverside locations to feed, perch, roost or nest.

As noted above, the project will facilitate the growth and expansion of the Manchester Airport leading to an increase in commercial air traffic above the Merrimack River corridor. However, unlike large flocking birds such as geese and gulls, eagles do not pose a significant hazard to aircraft. Therefore, they are not at significant risk from collisions with increased commercial aircraft traffic.

Summary of Effects

Direct effects of the action on bald eagles by construction-related disturbances are expected. Initial impacts to the nesting pair may result from construction activities at the river crossing. Eagle feeding behavior will be altered and flight distances to and from the nest will increase as the birds attempt to avoid human activity. Over time, this frequency of impact combined with other land alterations in the corridor may cause the eagles to abandon the present nest site and/or construct a new nest farther removed from human activity. Use of habitat immediately adjacent to the new bridge by foraging eagles (both the birds nesting and those wintering in the area) will be reduced due to eagle avoidance of the bridge. Overnight roost sites on the peninsula and at the mouth of Sebbins Brook may become unsuitable, or be used less frequently by eagles during and after construction.

CONCLUSION

After reviewing the current status of the bald eagle throughout its range and in the action area, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the project, as proposed (including the conservation measures noted on pages 3 and 4), is not likely to jeopardize the continued existence of the bald eagle. No critical habitat has been designated for this species; therefore, none will be affected.

The Service finds that this project is not likely to jeopardize the continued existence of the bald eagle within the Northern States Recovery Region because only one nesting pair occurs within the action area and 290+ pairs occur nearby in other northeastern states. Moreover, more than 2,500 pairs are known to occur in the Northern States Recovery Region.

The Service believes that reproduction by the Bedford pair may be lost for one or possibly two breeding seasons, but that loss will not affect either local (New England-wide) or regional recovery trends. Also, although a larger number of eagles (up to 20 or more) may winter or winter in part within the project area, the Service anticipates that most of the action area will not be directly affected by the proposed action and will continue to provide habitat for wintering eagles. The capacity of the lower Merrimack River to support wintering eagles may be reduced during and after construction. However, based on the relatively small fraction of eagles within the Northern States Recovery Region that winter in the project area, population level effects on the bald eagle will be negligible. Therefore, the Service concludes that the limited effects

on reproduction, number, and distribution of the species are not expected, directly or indirectly, to reduce appreciably the likelihood of the survival and recovery of the bald eagle in the wild.

III. INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the ESA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without special exemption. Harm means an act which actually kills or injures listed wildlife. It is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as an act or omission that creates the likelihood of injury to listed wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering.

Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a federal agency or applicant. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of an agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

AMOUNT OR EXTENT OF TAKE

The Service has reviewed the information in the Bald Eagle Biological Assessment, the FEIS, and other relevant portions of the administrative record and determines that incidental take, in the form of harassment of the nesting pair and other eagles using the Merrimack River shoreline, is anticipated as a result of the action. The Service believes that the pair may abandon the nest at some point during the 30 months necessary to construct the bridge. The transportation agencies have agreed that between January 1 and June 15, no construction will occur in the tertiary buffer zone around the nest during the first construction season for the bridge. However, it is anticipated that take of up to two eggs or chicks per year for the two subsequent construction/breeding seasons may occur.

Riparian habitat utilized by both nesting and wintering eagles will also be taken as a result of the project. Because eagles generally avoid areas in the immediate vicinity of artificial structures such as highways, an area of perhaps 200 feet radius to 660 feet radius around the bridge may be lost to use by eagles. Therefore, a range of from 3 acres to over 30 acres (measured liberally as the area of a circle) will be taken.

This level of incidental take, combined with the incidental take of bald eagles previously authorized in biological opinions in the New England States, 1990-present (Appendix B), will have no population level effects on the bald eagle in the Northern States Recovery Region. This conclusion is based on the fact that,

during the period that this cumulative incidental take was authorized, bald eagle numbers in the New England states have increased from 129 to 295 territorial pairs, a 129% increase. During the same period, the breeding and wintering distribution of bald eagles within northeastern states has similarly expanded (USFWS unpubl. data). These same trends are also evident throughout the 24-state, Northern States Recovery Region (USFWS 1999; Jody Millar, USFWS, pers. comm.).

REASONABLE AND PRUDENT MEASURES

The measures described below are nondiscretionary, and must be implemented by the Federal Highway Administration (or the NH DOT) in order for the exemption in Section 7(o)(2) to apply. The transportation agencies have a continuing duty to regulate the activity covered by this incidental take statement. If the transportation agencies fail to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse. The Service considers the following reasonable and prudent measures to be necessary and appropriate to minimize take of the bald eagle.

- o Minimize the likelihood that nesting bald eagles will abandon the Bedford nest site by observing no-work buffer zones and seasonal construction restrictions.

- o Reduce the likelihood that eagle productivity will be adversely affected for more than one season by providing alternative nesting locations farther removed from the bridge crossing location.

- o Compensate for lost feeding, perching, and possibly roosting habitat through riparian habitat acquisition and protection.

Terms and Conditions

In order to be exempt from prohibitions of Section 9 of the ESA, the transportation agencies must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline the required reporting requirements. These terms and conditions are nondiscretionary.

1. Clearing of forest or other vegetation within 660 feet of the Bedford nest tree is prohibited.
2. Construction activities within the restricted area of the tertiary buffer zone, 660-1,320 feet from the nest, as noted in Figure 6, page 24 of the Biological Assessment, are prohibited from January 1 to June 15 of the first construction season for the bridge. Partial exception³ to this time-of-year restriction may be made if it is confirmed that the Bedford nest is not active (USFWS confirms that no adults are associated with the nest) that year.
3. Bald eagle activity within (a minimum of) ½ mile of the proposed bridge crossing shall be monitored one season prior to and for the duration of construction activities. The transportation agencies are

³ This determination cannot be reliably made until approximately April 15.

financially responsible for the monitoring program (see page 23 of the Biological Assessment). The objectives, methods, and reporting requirements shall be coordinated with this office and the New Hampshire Fish and Game Department. The transportation agencies shall fund the construction of two alternate nests that will be available for eagles to use in future nesting attempts. The nests shall be built of natural materials in live white pine trees and shall be completed prior to the onset of bridge construction. The locations and methods for placement of the artificial nests shall be coordinated with this office and the New Hampshire Fish and Game Department.

4. The transportation agencies shall acquire title to, or secure conservation easements on the parcels (with the exception of the NH Mainline tract) identified on pages 23 and 26 of the Biological Assessment **prior** to the letting of any contracts for highway/bridge construction.

The Service normally requires that action agencies carefully monitor the level of incidental take to insure that authorized take is not exceeded. In this case, that monitoring requirement will be met through implementation of #3 above. In addition, since the Bedford eagle pair is so highly visible, the effect of project construction on the birds' nesting behavior will be readily observable.

The Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. sections 703-712), or the Bald and Golden Eagle Act of 1940, as amended (16 U.S.C. Sections 668-668d), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

IV. CONSERVATION RECOMMENDATIONS

Riparian forest along the Merrimack River is an important natural resource for wildlife and the people of New Hampshire. It is a limited resource and it is declining. As the state's largest cities and their associated transportation systems occur in this river valley, increasing pressure to develop riparian forest and to expand transportation systems along the Merrimack River is anticipated.

It is recommended that the NH DOT and the FHWA consider riparian forest conservation a goal of future transportation planning within the Merrimack River corridor. We urge the transportation agencies to use their authorities to insure that as much as possible of the remaining undeveloped Merrimack River shoreline is maintained in an undeveloped, wooded condition. Without such efforts, much of the recent gains in eagle occurrence in and adjacent to the action area may be lost in the near future.

V. REINITIATION - CLOSING STATEMENT

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species

or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Our nation's symbol, the bald eagle, has made a remarkable comeback since the 1960s. The fact that eagles are striving to use habitats near urban areas is a positive sign for the species, but it will certainly bring us new challenges as we strive to meet both the needs of wildlife and the transportation needs of a growing human population.

We appreciate the high level of cooperation and coordination by your agency and the NH DOT during the planning of this project. Please contact Michael Amaral at 603/223-2541 if you have questions and for further coordination on eagles relative to this project.

Sincerely yours,

Michael J. Bartlett
Supervisor
New England Field Office

Attachment

cc: Wayne Vetter, NHFGD
Robert Barry, NH DOT
Richard Roach, ACOE
Mark Kern, USEPA
Lori Summer, NHDES
Normandeau Associates
Richard Moore, ASNH
Tom Irwin, CLF
M. Bartlett, NEFO
W. Neidermyer, NEFO
M. Amaral, NEFO
M. Leahy, Senator Gregg's Office, Concord, NH
J. Rose, Senator Smith's Office, Portsmouth, NH
Sheridan Brown, Rep. Sununu's Office, Manchester, NH
Pam Kocher, Rep. Sununu's Office, Dover, NH
Reading File

ES: MAmaral:1-3-02:603-223-2541

LITERATURE CITED

- Audubon Society of New Hampshire. 2001. Monitoring and management of wintering bald eagles. Excerpt from NH Fish and Game Dept. Section 6 report to USFWS.
- Buehler, D.A., T.J. Mersmann, J.D. Fraser and J.K. Seegar. 1991. Effects of human activity on bald eagle distribution on the northern Chesapeake Bay. *Journal of Wildlife Management* 55:282-290.
- Chandler, S.K., J.D. Fraser, D.A. Buehler and J.D. Seegar. 1995. Perch trees and shoreline development as predictors of bald eagle distribution on Chesapeake Bay. *J. Wildl. Manage.* 59(2):325-332.
- Cook, R.A., C.J. Martin, L.S. Deming. 1997. The New Hampshire endangered species program status and management report, 1 April 1996-31 March 1997. Annual report on Federal listed birds, Projects No. EW-1-15.
- Fraser, J.D. 1985. The impact of human disturbance on bald eagle populations—a review. Pages 68-84 in J.M. Gerrard and T.N. Ingram, ed. *Proc. of bald eagle days*. 1983. The Eagle Foundation, Apple River, Ill.
- Fraser, J.D., L.D. Frenzel and J.E. Mathisen. 1985. The impact of human activities on breeding bald eagles in north-central Minnesota. *Journal of Wildlife Management* 49:585-592.
- Fyfe, R.W. and R.R. Olendorff. 1976. Minimizing the dangers of nesting studies to raptors and other sensitive species. *Can. Fish and Wildlife Service. Occas. Pap.* 17pp.
- Grubb, T.G. and R.M. King. 1991. Assessing Human Disturbance of Breeding Bald Eagles with Classification Tree Models. *Journal of Wildlife Management.* 55(3):500-511.
- Grubb, T.G., W.W. Bowerman, J.P. Giesy and G.A. Dawson. 1992. Responses of breeding eagles, *Haliaeetus leucocephalus*, to human activities in northcentral Michigan. *Canadian Field-Naturalist* 106(4):443-453.
- Millsap, B., L. Phillips, L. McConnell, N. Douglass, S. Taylor, J. Jones and T. Breen. 2000. Comparative fecundity and survival of bald eagles fledged from suburban and rural natal areas. *Ann. Perf. Report. Florida Fish and Wildlife Commission.* 32 pp.
- Palmer, R.S. Editor. 1988. *Handbook of North American birds*. Vol. 4. Diurnal Raptors, Part 1. Yale Univ. Press, New Haven, Conn., and London, U.K. 433pp.
- Schempf, P.F. 1997. Bald eagle longevity record from southeastern Alaska. *Journal of Field Ornithology* 68:150-151.

- Stalmaster, M.V. and J.R. Newman. 1978. Behavioral responses of wintering bald eagles to human activity. *J. Wildl. Manage.* 42(3):506-513.
- Steenhof, K. 1976. The ecology of wintering bald eagles in southeastern South Dakota. M.S. Thesis. Univ. of Missouri, Columbia, 148 pp.
- Therres, G.D., M.A. Byrd and D.S. Bradshaw. 1993. Effects of Development on Nesting Bald Eagles: Case Studies from Chesapeake Bay. *Trans. 58th North American Wildlife and Natural Resources Conference.* 62-69.
- U.S. Dept. of Transportation, Federal Highway Administration and State of New Hampshire, Department of Transportation. 2001. Manchester Airport Access Road Bedford-Manchester-Londonderry-Litchfield-Merrimack DPR-F-0047 (001), 11512. Bald Eagle Biological Assessment. 32 pp. & app.
- U.S. Dept. of Transportation, Federal Highway Administration and State of New Hampshire, Department of Transportation. 2001. Final Environmental Impact Statement. Manchester Airport Access Road Bedford-Manchester-Londonderry-Litchfield-Merrimack DPR-F-0047 (001), 11512. Bald Eagle Biological Assessment. 32 pp. & app.
- U.S. Fish and Wildlife Service. 1979. List of endangered and threatened wildlife and plants. *Federal Register* 44: 3644.
- U.S. Fish and Wildlife Service. 1983. Northern states bald eagle recovery plan. Washington, D.C. 76 pp. and appendices.
- Wiemeyer, S.N., T.G. Lamont, C.M. Bunck, C.R. Sindelar, F.J. Gramlich, J.D. Fraser and M.A. Byrd. 1984. Organochlorine pesticide, PCB and mercury residues in bald eagle eggs, 1969-1979, and their relationships to shell thinning and reproduction. *Archives of Environmental Contamination and Toxicology* 13:529-549.
- Wood, P.B., M.W. Collopy and C.M. Sekerak. 1998. Post fledging nest dependence period for bald eagles in Florida. *Journal of Wildlife Management* 62:333-339.

Appendix A

CONSULTATION HISTORY

April 2, 1992 -- Scoping Meeting at New Hampshire Department of Transportation (NHDOT) between NHDOT, Federal Highway Administration (FHWA) and U.S. Fish and Wildlife Service (USFWS) to discuss the purpose of the proposed Project Bedford-Manchester-Londonderry F-042-1(1), 11512, project schedule and environmental issues.

April 16, 1992 -- Letter from Mary F. Small, Normandeau Associates, Inc. (NAI) - contractor for NHDOT and Holden Engineering and Surveying, Inc. (HES) - to Michael J. Amaral, USFWS requesting listed and rare species information for preparation of an Environmental Impact Statement (EIS) for the Manchester Airport Access study.

May 6, 1992 – Letter from Carol R. Foss, Audubon Society of New Hampshire (ASNH) to Mary F. Small, NAI summarizing information on state- and federally-listed species that occur or may occur within the project area, including information on wintering bald eagles, the brook floater and species that may be present in wetlands, grasslands and pine barrens within the project area.

May 12, 1992 – Meeting at USFWS, Concord, NH between Michael Amaral, William Neidermyer, USFWS, Ann Tappan, Eric Orff, William Ingham, New Hampshire Fish and Game (NHFG), Diane DeLuca, ASNH and Mary Small, NAI to discuss the project's consultation requirements under the ESA due to the presence of wintering bald eagles, and the need for additional data on feeding, perching and roosting sites in order to assess the project impacts on bald eagles and in order to prepare the required Biological Assessment (BA).

June 9, 1992 – Meeting at NHDOT, Concord, NH, between Robert Barry, E. William Roy, William R. Hauser, NHDOT, William Neidermyer, Michael Amaral, USFWS, and William F. O'Donnell, FHWA to discuss strategies for evaluating listed-species habitats within project area.

June 23, 1992 – Meeting at NHDOT between William Hauser, E. William Roy, Marc Laurin, Robert Barry, NHDOT and Carol Foss, Diane DeLuca, Andy Kendall, ASNH to discuss information needed for BA.

September 1, 1992 – Letter from William J. Barry, NAI to Michael Amaral, USFWS describing proposal for conducting winter bald eagle survey.

September 9, 1992 – Meeting at USFWS, Concord, NH between Robert Barry, E. William Roy, NHDOT, William Barry, Mary Gaudette, Mary Small, NAI, Michael Amaral, USFWS and Diane DeLuca, ASNH to discuss proposal for winter bald eagle survey. Survey area will be within 1,000 ft of the Merrimack and within the Airport Access study area, and according to the USFWS surveys should be conducted for three full days/week from 12/1 to 3/15.

September 24, 1992 – Site visit to Lower Merrimack River (Bedford to Litchfield) via canoe by Michael Amaral and Susi von Oettingen, USFWS to survey for freshwater mussels and assess feasibility of surveying wintering eagles via a small boat, which was considered possible.

October 21, 1992 – Letter from Robert T. Barry, NHDOT to Michael Amaral, USFWS requesting comments from USFWS on NAI's proposed bald eagle survey from 12/1/92 - 3/15/93 that was sent to NHDOT October 7, 1992.

November 24, 1992 – Memo from Mary F. Small, NAI to Robert Barry, E. William Roy, NHDOT, Michael Amaral, USFWS, Diane DeLuca, ASNH and William Barry, R. Simmons, Mary Gaudette, NAI regarding trial boat survey conducted by NAI November 11, 1992 and recommending the abandonment of boat surveys due to accessibility of the riverbank by foot.

January 21, 1993 – Meeting at USFWS, Concord, NH between Michael Amaral, USFWS, E. William Roy, Robert Barry, NHDOT, Mary Small, Mary Gaudette, NAI and Diane DeLuca, ASNH to discuss progress on NAI's winter survey and monitoring study. The group agreed to eliminate certain sites, confirm known sites identified by ASNH, conduct evening roost surveys and survey potential roost sites.

June 17, 1993 – Letter from Gordon E. Beckett, USFWS to E. William Roy, NHDOT acknowledging receipt of the report "Survey of Wintering Bald Eagles along the Merrimack River" prepared by NAI and dated May 1993.

December 2, 1993 – Letter from Gordon E. Beckett, USFWS to E. William Roy, NHDOT providing comments on the May 1993 report "Survey of Wintering Bald Eagles along the Merrimack River" and pointing out that the report is not a preliminary version of the BA, but a summary of available biological information on wintering bald eagles and should be useful to NHDOT and FHWA in preparing a BA.

May 15, 1994 – Meeting at USFWS, Concord, NH between Robert Barry, E. William Roy, NHDOT, William Barry, NAI, William O'Donnell, FHWA, Michael Amaral, USFWS, Diane DeLuca, ASNH and Rich Roach, U.S. Army Corps of Engineers (ACOE) to discuss the report, USFWS's comments from 12/2/1993, further consultation requirements under the ESA, and that a BA is still needed, which may be replaced by an EIS.

July 21, 1994 – Letter from E. William Roy, NHDOT to Michael Amaral, USFWS including minutes of May 15, 1994 meeting and a new map of eagle perch/roost sites dated July 19, 1994.

July 18, 1997 – Letter from Patrick W. Fairbairn, NAI to William Neidermyer, USFWS requesting an update from 1992 on listed-species information for EIS.

July 23, 1997 – Letter from Michael Amaral, USFWS to Richard Roach, ACOE summarizing telephone conversations and meetings re Public Notice 199501152.

July 31, 1997 – Letter from E. William Roy, NHDOT to Michael Amaral, USFWS requesting a review and comments (by 8/8/97) on draft BA to be included in DEIS.

August 12, 1997 – Letter from Laura Deming, ASNH to USFWS with comments on DEIS.

August 15, 1997 – Comment letter from Michael Amaral, USFWS on draft BA sent to E. William Roy, NHDOT stating that the draft BA addresses habitat alteration and loss within ¼ mile, but does not estimate how this will affect wintering bald eagles, nor does it address potential mitigation measures.

September 17, 1997 – Memorandum from William O'Donnell, FHWA to Michael Amaral, USFWS requesting feedback on an updated version of draft BA and potential mitigation site "Church property".

October 16, 1997 – Site visit to Sebbins Roost in Bedford by Craig Wood, NAI, John Kanter, NHFG, Laura Deming, ASNH, E. William Roy, NHDOT, William O'Donnell, FHWA and Michael Amaral, USFWS to discuss mitigation measures.

October 16, 1997 – Letter via facsimile from John Kanter, NHFG to Michael Amaral, USFWS with copies of 1995 letters sent to landowners that have wintering bald eagle roosts on their properties.

October 17, 1997 – Comment letter from Kenneth C. Carr, USFWS to William O'Donnell, FHWA on the second version of the draft BA indicating improvements to first draft BA, but in order for the Service to determine that the project is "not likely to adversely affect" bald eagles, USFWS needs more information on mitigation and measures to minimize short-term disturbance from construction. USFWS also reaffirmed its interest in three properties (for mitigation): Site 10, Site 9 and Site 13, which was acquired by the Town of Bedford "for conservation", as informed in a January 24, 1997 letter from Karen White.

November 4, 1997 – Letter from William F. O'Donnell, FHWA to Michael Amaral, USFWS pointing out that FHWA/NHDOT cannot incorporate all of USFWS's suggested changes, such as avoiding bridge construction during winter or restricting pedestrian use in winter.

December 3, 1997 – Letter from William F. O'Donnell, FHWA to Michael Amaral, USFWS enclosed with copy of two-volume DEIS, asking not to complete a formal evaluation until after the 1/8/98 public hearing and after the wetland mitigation plan has been finalized.

January 7, 1998 – Letter from James D. Fraser, Virginia Tech, to Robert T. Barry, NHDOT and William F. O'Donnell, FHWA with comments on DEIS, as he was retained by Devine & Nyquist, representing Coastal Specialty Forest Products, Inc.

January 8, 1998 – Letter via facsimile from Jim Sweeney, UNH to John Kanter, NHFG with summary of data collected 12/27/97 - 6/1/98 on property of Coastal Forestry Products in Bedford, NH, including observations of a new roost site.

January 22, 1998 – Meeting at NHDOT, Concord, NH between Robert Barry, William Hauser and Charlie Hood, NHDOT, William F. O'Donnell, FHWA, Michael Amaral, William Neidermyer, USFWS, John Kanter, NHFG and Craig Wood, NAI to discuss input from Jim Fraser and Jim Sweeney and to determine how the preferred alternative, CG Modified, will affect bald eagles.

January 27, 1998 – Site visit to “Sweeney” roost site in Bedford by Jim Sweeney, UNH, Robert Barry and Doug Cygan, NHDOT, Craig Wood and Lee Carbonneau, NAI, Michael Amaral, USFWS, Laura Deming, ASNH and John Kanter, Delayne Brown, NHFG. Group agrees to suggest moving the alignment 150-200 feet to south.

February 4, 1998 – Letter from William F. O'Donnell, FHWA to James D. Fraser stating that the new observations will be evaluated further.

February 4, 1998 – Letter from Robert T. Barry, NHDOT to Michael Amaral, USFWS asking for review of 1/27/98 field trip report and concurrence on 1/29/98 proposal for additional winter eagle surveys.

August 17, 1998 – Letter from Laura Deming to Lee Carbonneau and Craig Wood, NAI summarizing winter eagle roosting activity along the Merrimack River.

December 17, 1998 – Telephone conversation from E. William Roy, NHDOT to Michael Amaral, USFWS re 12/16 meeting asking which alignment would be best.

December 17, 1998 – Letter from E. William Roy, NHDOT to Michael Amaral, USFWS including NAI's “Supplemental Bald Eagle Perching and Roosting Survey”, comparison of alternatives, and maps depicting alignments.

December 21, 1998 – Letter via facsimile from Mark Kern, Environmental Protection Agency (EPA) to William Neidermyer, Michael Amaral, USFWS regarding EPA's comments to NHDOT's 12/16/98 announcement to pursue the preferred alternative from the DEIS, and whether a supplemental EIS (SEIS) will be necessary.

January 28, 1999 – Letter from Robert T. Barry, NHDOT to Richard Roach, ACOE summarizing comments made at 1/20/99 Resource Agencies meeting between NHDOT, FHWA, ACOE, NHFG and EPA to discuss impacts associated with alternatives DCD and CG Modified Shift. USFWS views alternative DCD as least damaging to bald eagles and their habitat, and EPA views the same alternative as the Least Environmental Damaging Practicable Alternative (LEDPA).

February 8, 1999 – Letter from Richard M. Plante, Town of Londonderry to Leon Kenison, NHDOT vehemently opposing alternative which fails to provide access to their industrial land, and stating that CG Modified Shift is their preferred choice.

March 3, 1999 – Letter from Lee Carbonneau, NAI to Robert Barry, NHDOT presenting Scope of Services for Eagle Habitat Mitigation (Manchester Airport) including bald eagle conservation management plan from Manchester south to state border and comprehensive eagle roost tree identification model.

April 20, 1999 – USFWS site visit to Bedford to view alternatives DCD and CG Modified Shift.

April 21, 1999 – Meeting at NHDOT between Thomas Myers, William O'Donnell, FHWA, Richard Roach, Ruth Ladd, ACOE, Michael J. Bartlett, Michael Amaral, USFWS, William C. Ingham, Jr., Eric Orff, NHFG, Lori Sommers, New Hampshire Department of Environmental Services (NHDES), Craig Wood, NAI and Robert T. Barry, William Hauser, E. William Roy, Charles Hood and Mark Hemmerlein, NHDOT to discuss mitigation measures. A list of properties with eagle use (Hooksett to Merrimack) was presented. NHDOT will consider list, will add management plan, conservation protection for railroad property, and assurance to protect Roost A and West Bank, and possibly acquire other sites.

May 18, 1999 – Letter from Michael J. Bartlett, USFWS to William F. Lawless, ACOE regarding ACOE's LEDPA, CG Modified Shift, and stating that USFWS thinks that DCD will actually have less impact on wetlands.

June 7, 1999 – Conference Report of April 21, 1999 Meeting at NHDOT.

August 2, 1999 – Letter from Michael J. Bartlett, USFWS to William F. Lawless, ACOE stating that if NHDOT protects Hooksett as well, USFWS will not appeal CG Modified Shift although USFWS still believes that DCD is LEDPA.

April 14, 2000 - Letter from Michael J. Bartlett, USFWS to Robert Barry, NHDOT regarding the in lieu fee concept for acquisition of habitat for mitigation purposes.

April 26, 2000 - Meeting between Michael Amaral, USFWS, John Kanter, NHFG and Laura Deming, ASNH during which in lieu fee and eagle roost sites were discussed.

May 18, 2000 - Copy of letter from Leon Kenison, NHDOT to Col. Brian E. Osterndorf, ACOE requesting approval of the DOT's mitigation package.

September 6, 2000 - Conference call between Michael J. Bartlett, William Neidermyer, and Michael Amaral, USFWS, and William F. Lawless and Richard Roach, ACOE. In lieu fee and affirmation that no construction would begin until mitigation is complete were discussed.

February 7, 2001 - Email message from Michael Amaral to Paul Nickerson and William Neidermyer, USFWS, John Kanter, NHFG and Chris Martin, ASNH regarding the reported discovery of a pair of bald eagles constructing a nest near the CG Modified alignment in Bedford. Site visit the same day confirmed presence of the nest.