BIOLOGICAL STATUS REPORT
For the Bald Eagle

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(Haliaeetus leucocephalus)

EXECUTIVE SUMMARY

The Florida Fish and Wildlife conservation Commission (FWC) received a petition in July 2002 to evaluate the status of the bald eagle (*Haliaeetus leucocephalus*), a species that is currently listed as Threatened (Rule 68A-27.004 F.A.C.). This petition is available at http://myfwc.com/imperiledspecies/petitions/Bald-eagle-petition.pdf. A moratorium on listing actions precluded action on the petition until a review of the listing process was completed. The Commission approved a new listing process rule during its April 2005 meeting, and directed staff to move forward on pending petitions, including the petition for the bald eagle. Following the guidance of the listing process rule (68A-27.0012 F.A.C.), a five member biological review panel (BRP) for the bald eagle was approved at the June 2005 Commission meeting. Public input on the status of the bald eagle was sought from July 15, 2005 through August 31, 2005. The BRP met on October 11, 2005 and conducted the biological assessment by evaluating species specific data against imperilment criteria found in 68A-1.004 F.A.C. Please visit http://myfwc.com/imperiledspecies/listingproceduresanddefinitions.pdf to view the listing process rule and the criteria found in the definitions. The BRP concluded from the biological assessment that the bald eagle no longer met criteria for listing at any level, has not met the criteria for listing within the last 5 years, and unanimously recommended removing the bald eagle from the list of threatened species. Independent scientific review of the biological assessment was sought and received from five scientists. While these reviews indicated various suggested edits to text and one suggested a different approach to calculating the area of occupancy (which was incorporated), all five agreed the assumptions, interpretations, and conclusions of the assessment were reasonable, and most complimented the panel on the quality of the assessment. The Biological Review Panel thanks the Independent Reviewers for there reviews, and Brian Beneke and Karen Whitney who assisted with the effort to calculate the area of occupancy and extent of occurrence. Staff of the FWC gratefully acknowledges the efforts of the members of the Biological Review Panel.

BIOLOGICAL INFORMATION

The Biological Information section of this document is not intended to be a comprehensive report on bald eagle literature, but rather to provide a basic understanding of the species. For a detailed account of information relative to bald eagles, please see Stalmaster (1987), Gerrard and Bortolotti (1988) and Buehler (2000).

Taxonomy

World wide there are eight species in the genus *Haliaeetus*, which is from the Greek and means, literally *sea* eagle (the bald eagle's full scientific name means *white-headed sea eagle*). The bald eagle is the only sea eagle that occurs as a common bird in the new world. The other 7 members of the genus occur as Euro-Asian (1), Asian (2), African (2) and Australo-Pacific (2) species. The closest living relative to our bald eagle is probably the white tailed sea eagle (*H. albicilla*) of Europe and Asia.

Two subspecies of bald eagles are recognized based on size and distribution, but there is growing doubt that these differences constitute anything but decreasing size along a north to south breeding range gradient. Bald eagles that nest in Florida are noticeably smaller than those that breed north of the 40th parallel. Fossil evidence of bald eagles in North America dates back at least 1 million years and comes from several sites throughout the United States. Our other American eagle, the golden eagle (*Aquila chrysaetos*) is in a different genus with many differences in life history and habitat requirements. Buehler (2000) provides a thorough review of eagle taxonomy.

Life History & Habitat Requirements

Bald eagle (*Haliaeetus leucocephalus*) populations have recovered from precariously low levels throughout the continental United States (Buehler 2000). The species precipitous decline was brought on by suppressed reproductive performance caused by contamination of the pesticide DDT and its various byproducts, and historic persecution. Bald eagle numbers have slowly increased since widespread use of DDT was banned in 1972. Recovery has reached the point that the U.S. Fish & Wildlife Service (U.S. Fish & Wildlife Service 1999 & 2006) has published their intent to remove

the bald eagle from the list of endangered and threatened species. Justification for this decision is that throughout their range, the bald eagle has reached or exceeded the population goals established by the various regional recovery plans. The latest version of the bald eagle recovery plan for the Southeastern Region (U.S. Fish & Wildlife Service 1989) identifies 1000 annually nesting pairs as the number necessary for declaring the population recovered in Florida.

The sexes look alike with females being larger than males. Full adult plumage (dark chocolate brown body and wings, white head and tail) is attained after five years. Their first year plumage is generally dark all over with white under wing coverts. Plumage becomes progressively more mottled in appearance through the second and third years. They look similar to adults during the forth year, but with some dark flecking still present in the head and tail.

Age of first breeding is similar to age at which birds acquire adult plumage, typically 5 years. Bald eagles are perennially monogamous with pair bonds persisting for several years. However surviving pair members will re-pair following the loss of a mate. This results in territory maintenance that greatly exceeds the average life expectancy of an individual eagle. In Florida, nest building and maintenance can begin in September with most eggs being laid from December through early January. Fledging of young occurs by May, but young may remain near the natal territory into early to mid summer (Wood et al. 1998). The average clutch size is 2 however, 3 is not uncommon. The average brood size in Florida is 1.56, though 3 chick broods are not unusual. Based on information from the Bald Eagle Population Survey, from 1991 through 2000, the average annual success rate of occupied bald eagle territories in Florida was approximately 73% (Steve Nesbitt, pers. comm.).

Bald eagle habitats incorporate fresh or salt water throughout their range. Nest sites are typically in living pine trees (*Pinus* spp) sometime cypress (*Taxodium distichum*) and to a lesser extent other tree species (Wood et al. 1989). Bald eagles have recently initiated nests on man-made structures in Florida. They will nest in Mangroves or on the ground in the Keys and Florida Bay (Curnutt, 1996). Nests are typically in a dominant tree and tend toward being at edges or ecotones (McEwan and Hirth 1979). Florida nest territories are typically within 1.86 mi (3 km) of water and the average nest is 0.66 mi

(1.06 km) from water (McEwan and Hirth 1979). Territory sizes vary, depending on habitat and prey density, but may average 0.62–1.24 mi^2 (1-2 km^2)(Buehler 2000).

Preferred prey of Florida bald eagles includes fish (freshwater catfish [*Ictalurus* spp.], sea catfish [*Arius felis*], and mullet [*Mugil* spp.]) and water birds (coots [*Fulica americana*, and wading birds including cattle egrets [*Bubulcus ibis*] and even great blue herons [*Ardea herodias*]; Curnutt 1996).

Longevity in the wild is likely 15 to 20 years with the record being 28 years. While different studies have documented different rates of first year survival, in summarizing the literature, Buehler (2000) indicated an average value for first year survival, from nest departure to one year, may be about 73%; and cumulative survival to adulthood (4.5 year) was 50% for Florida eagles (Wood 1992). Please see Gerrard and Bortolotti (1988) and Buehler (2000) for more detail on the life history of bald eagles.

Historic Distribution

There are current and historic breeding records throughout North America including Alaska, all provinces of Canada, parts of Mexico, and the contiguous 48 states. The species is known to regularly nest in 62 of 67 Florida counties, with most of the population concentrated in the counties from north-central to the southern region of the peninsula (Figure 1). There are several areas of concentrated nesting, many that have persisted since the end of World War II. These include the Kissimmee River chain of lakes in Osceola and Polk Counties; the Harris chain of lakes in Lake County; the area of Lake George in Lake, Marion, Putnam, and Volusia Counties; the middle St Johns River area in Orange and Seminole Counties; Southwest Florida in Lee and Charlotte Counties; and Lochloosa, Newnans and Orange Lakes in Alachua County.

The historic population of bald eagles in Florida was estimated to be "…in excess of 1,000 nesting pairs" (Peterson and Robertson, 1978). The species was still recovering from the effects of DDT contamination when a statewide survey of nesting bald eagles began in the 1972-1973 breeding season. The annual nesting population estimates between the early 1970s and early 1980s averaged less than 400 pairs. The apparent early increase in the population was, in part, due to the discovery of previously unknown nesting territories. However, by the mid-1980s, biologists believed the documented

increases were more reflective of actual population growth. The number of documented active nesting territories first exceeded 1000 in 1999 (Florida Fish and Wildlife Conservation Commission, unpublished Annual Report 2005). Recently, the estimated Florida nesting population, which had been increasing annually by 5% to 7%, seems to have leveled off at just over 1100 documented nesting pairs. The number of active territories documented in Florida during the 2004-2005 nesting season was 1,133.

Threats

The greatest long term threat to the population in Florida is loss or degradation of bald eagle habitats. Though bald eagles have shown great tolerance for nesting in close proximity to development (Millsap et al. 2004) this tolerance will persist only as long as a sufficient prey base and nest sites remain intact. If sufficient nesting habitat can be preserved to support this level of nesting we can hope that the number of occupied nesting territories in Florida (currently the largest in the lower 48 states) will be sustained. However, we can expect to see productivity of bald eagles in Florida decline if the health of aquatic habitats declines in Florida, even if nesting habitat is preserved. This could eventually result in a declining population when the number of available bald eagles is insufficient to replace mortality of breeding adults.

While most natural mortalities go undetected, the greatest source of documented mortality for Florida bald eagles is trauma related. Trauma was associated with 68% of 234 diagnosed mortalities. Collision with automobiles made up 44% of 182 eagle trauma related bald eagle deaths necropsied from 1963 – 1994; gunshots accounted for 10%, and death due to power line strikes was 4%. Intraspecific aggression, which is a natural mortality factor, has increased as the bald eagle population has increased, accounted for 7% of the losses. Poisoning (10%), inclement weather (7%), electrocution (6%), and infectious diseases (5%) were identified as causes of death in most (but not all) of the remaining cases (Forrester and Spalding 2003).

Poisoning included agricultural pesticides and other general application chemicals. Lead poisoning (from shot ingested when bald eagles consume imbedded shot in waterfowl) and mercury have been a concern. The ban on the use of lead shot for waterfowl hunting should reduce the lead threat; however the bioaccumulation of

mercury in fish will continue to be a potential threat. Secondary pentobarbital poisoning (from euthanized domestic animals), is a source of mortality that could be easily avoided if the animal carcasses were disposed of properly.

Millsap et all (2004) documented the mortality of 18 Florida bald eagles that had been fitted with radio-transmitters. Vehicle collision (n = 4, 22.2%) was the leading known cause of death, followed by disease (n =3, 16.7%), electrocution (n = 2, 11.1%), starvation/malnutrition (n = 2, 11.1%), storm related trauma (n = 1, 5.6%), and poison (n = 1, 5.6%). Cause of death was unknown for 5 of the 18 (27.8%) bald eagle carcasses recovered.

Avian Vacuolar Myelinopathy (AVM), a recently discovered neurologic disease, is a significant threat to the health of the bald eagle population in Florida. The disease was first found in bald eagles and coots in southwestern Arkansas in the winter of 1996-1997; it has since been implicated in more than 100 bald eagle deaths in Georgia, South and North Carolina. So far AVM has not been detected in Florida, but Florida bald eagles do visit states where AVM has been documented and if it entered the Florida population it could result in substantial localized mortality. Avian flu (highly pathogenic avian influenza H5N1) is another potential threat to Florida's bald eagle population. Avian flu has been documented in wild birds in Asia and Europe. There is the potential that this disease, West Nile Virus, or other diseases not mentioned in this report, could pose a serious threat to future bald eagle populations.

BIOLOGICAL ASSESSMENT

In accordance with rule 68A-27.0012 F.A.C, the BRP was to evaluate the biological status of a petitioned species using criteria included in definitions in 68A-1.004 and following the guidance of "Guidelines for Application of IUCN Red List Criteria at Regional Levels Version 3.0" and "Guidelines for Using the IUCN Red List Categories and Criteria." If a species meets the threshold for listing at any one criterion, it may be considered for State listing at the highest threat level identified by the criteria. The following is a description of the biological assessment of the bald eagle completed by the BRP. Florida specific data are used in the evaluation, as the region of concern is

the State of Florida. However, the potential influence of the global bald eagle population on the Florida population is considered using the regional application.

Generation Length.-- Generation length is defined as the average age of parents in the current cohort, and is usually greater than the age of first reproduction, but less than the age of the oldest breeding individual. None of the panel members were aware of any study that presented a generation length consistent with the IUCN definition. All agreed that the generation length would be from 8 to 12 years, and that there would be no impact on the evaluation whether the time was 8 or 12 years (3 generation review period of 24 versus 36 years). One unpublished Vortex model estimated generation time to be 8.8 for females and 9.8 for males (Millsap, pers. comm.), and this supports the generation length used by the BRP in this assessment.

Criterion A: Rate of decline

Criterion A is designed to identify species that have undergone a significant decline in the recent past, or are projected to experience a significant decline in the near future.

Florida's bald eagle population has been the subject of nest monitoring since 1973. The number of active territories monitored in 1973 was 88. The number of known active territories was 359 by 1981. Results of the 2005 nest survey indicate 1,133 active territories (Florida Fish and Wildlife Conservation Commission, unpublished Annual Report 2005). As such, the bald eagle in Florida has experienced a greater than 300% increase in population size in the last 24 years. All members of the panel agreed that there has been a <u>significant increase</u> in the bald eagle population size, regardless of whether the review period used is 36 years or 24 years. This population increase has been estimated using an index of abundance appropriate to the species and is based on a minimum number of known nests. We are assuming the actual increase in the bald eagle population is similar to that observed via the nest monitoring study.

Criterion A1 and A2.-- A reduction in population size over the last 3 generations (or 10 years, whichever is longer) is required to qualify for listing under these sub-

criteria. This species has significantly increased in the last 3 generations; therefore, **this species does not warrant listing based on these sub-criteria**.

Criterion A3.-- A species within the next 3 generations (36 years in this case) must be projected or suspected to experience at least a 30% reduction in population size to meet the requirements of A3 at the SSC level. There are many threats that could *potentially* lead to a future decline of this species. Excessive loss of habitat, a decrease in the bald eagle's prey base, or a lack of protection of nest sites could result in a population decrease. However, Florida has experienced a significant human population increase and the related habitat loss to development that is associated with human population growth during the same time period in which the bald eagle has experienced a substantial increase in population size. Bald eagles in Florida have demonstrated an ability to adapt to a wide range of land use; therefore it seems plausible that even with continued human population growth, this species is likely to persist if adequately protected. Threats of various diseases or potential negative impacts of pollution could cause a future population decline. However, there currently is no documented evidence to suggest a 30% population decline is likely to occur in the next 3 generations and this BRP is not aware of any current literature suggesting such a decline; therefore **this species does not warrant listing based on this sub-criterion**.

Criterion A4.-- A reduction of at least 30% must occur where the time period must include both the past and future and the causes of the reduction may not be known, or understood, or ceased, or reversible to meet the requirements of A4 at the SSC level. This species has experienced population increases in the past, and is not expected to experience significant population declines in the future; therefore, **this species does not warrant listing based on this sub-criterion**.

Result: The species does not warrant listing based on criterion A, rate of decline.

Criterion B: Extent of occurrence and area of occupancy

Criterion B was designed to identify species with a restricted distribution that is

also fragmented, undergoing decline, and/or exhibiting extreme fluctuations. To meet the requirements for listing under criterion B, the general distributional threshold must first be met for at least one of the categories, extent of occurrence or area of occupancy. If the general threshold is met, the taxon must then meet at least two of three subcriteria listed for criterion B to warrant listing.

B1 Extent of occurrence.-- A species must have an extent of occurrence (EOO) of < 7,700 mi^2 (20,000 km^2) to qualify for listing as SSC under criterion B1. To estimate the EOO of the bald eagle in Florida, we generated a statewide dataset by combining the 1,078 active nests identified by the FWC's 2004 eagle nest survey and the 23 nests identified in the 2004-05 Everglades eagle nest dataset (there were the most current GIS datasets available), and then used the minimum convex polygon tool in ArcGIS to create a polygon around all known nests. The area within the polygon was calculated to be the EOO. The bald eagle occurs throughout most of Florida (Figure 1) and has an estimated extent of occurrence in Florida of 52,979 mi^2 (137,215 km^2), which exceeds the threshold for listing as SSC. While it is true that some "outlier" nests could be excluded from the polygon to decrease the estimated EOO, even if this were attempted, the estimated EOO would be well above the threshold. The general threshold is not met; therefore, **the species does not warrant listing based on the extent of occurrence.**

B2 Area of occupancy.-- A species must have an area of occupancy of < 770 mi^2 (2,000 km^2) to qualify for listing as SSC under criterion B2. Buehler (2000) suggested territory size may average 0.62–1.24 mi^2 (1-3 km^2). Presuming Florida's bald eagles have a territory size similar to that suggested for bald eagles in the literature, we calculated a minimum AOO using 0.62 mi^2 (1.61 km^2) as the territory size per nest, and a maximum AOO using 1.24 mi^2 (3.21 km^2) as the territory size per nest; presuming the actual AOO for Florida bald eagles was somewhere in between these values. The most easily obtained estimate of AOO would be the territory size multiplied by the estimated number of active nests. Based on information available in criterion C, it is estimated there were 1405 active bald eagle nests in Florida in 2005. As such, the estimated minimum AOO would be 871.1 mi^2 (2,256.14 km^2) and the estimated maximum AOO

would be 1742.2 mi^2 (4511.80 km^2). Based on this figure, even if the minimum AOO is used, this species would not meet the general threshold for this criterion.

Due to the fact that bald eagle territories often overlap, it was decided that an AOO estimate based on multiplying territory size by estimated number of nests might receive criticism. As such, we used the same dataset described in the evaluation of EOO, and created nest territory buffers (using 0.62 mi^2 [1.61 km^2] and 1.24 mi^2 [3.21 km^2]) around each nest (figure 2). Please note that GIS data for the 2005 nest season were not available in time for this calculation, so the 2004 nest data were used. Once buffers were created, the areas of buffers that overlapped were dissolved (to avoid an overestimate) using the buffer wizard in ArcGIS. Xtools in ArcGIS was used to calculate the total acres within the buffers which were then converted to square miles. The AOO based on the minimum territory size of 0.62 mi^2 (1.61 km^2) was calculated to be 658.76 mi^2 (1706.18 km^2; slightly below the threshold). The AOO based on the maximum territory size of 1.24 mi^2 (3.21 km^2) was calculated to be 1,275.86 mi^2 (3304.46 km^2; well in excess of the threshold). As the minimum estimated AOO of 658.76 mi^2 (1706.18 km^2) is close to the threshold of 770 mi^2 (1,994.29 km^2), the panel believes the actual AOO would exceed the threshold for the following reasons: 1) the BRP is not convinced that the appropriate territory size for Florida bald eagles would be the minimum territory size; 2) the number of active nests in 2005 increased to 1,133 which would increase the AOO value; and 3) recent studies indicate 24% of bald eagle nests go undetected and therefore the AOO would need to be increased accordingly. For these reasons, the BRP unanimously agreed the bald eagle did not meet the general threshold. The general threshold is not met; therefore, **the species does not warrant listing based on the area of occupancy.**

Even if the estimated minimum AOO was used to allow the general distribution threshold to be met, the species also would have to meet at least two of the subcriteria to warrant listing. The subcriteria for B2 include: (a) severely fragmented or known to occur in less than 11 locations; (b) a continuing decline in AOO; EOO; area, extent, and/or quality of habitat; number of locations or subpopulations; or number of mature individuals; (c) extreme fluctuations in AOO, EOO, number of locations or subpopulations, or number of mature individuals. The bald eagle in Florida is not

severely fragmented, and there are at least 16 bald eagle breeding "clusters" (Steve Nesbitt, unpublished data) which could be used to identify locations; therefore **subcriterion (a) does not apply**. The bald eagle in Florida is not experiencing a continued decline (indeed has experienced an increase); therefore **subcriterion (b) does not apply** (the BRP recognizes that one might argue the quality of habitat is declining; however, this is a hard case to prove as the bald eagle population has increased and is growing in urban areas where demographic characteristics are sufficient to support continued growth). The bald eagle in Florida does not experience extreme fluctuations in the number of mature individuals, AOO, EOO, or number of subpopulations; therefore **subcriterion (c) does not apply**. As none of the subcriteria are achieved, the bald eagle would not warrant listing even if the general threshold was met. This further justifies the decision that this species does not warrant listing based on area of occupancy.

Result: The species does not warrant listing based on criterion B, extent of occurrence or area of occupancy.

Criterion C: Small Population and decline

Criterion C is designed to identify species with a small population size that is currently declining or may decline in the near future. To qualify for listing under this criterion, the numeric threshold must first be met, as well as one of two subcriteria that describe decline.

The Florida bald eagle nest monitoring project identified 1,133 known active nests in 2005. Recent study indicates approximately 24% of bald eagle nests go undetected (Steve Nesbitt, pers. comm.). Based on this correction factor, it is estimated there were 1,405 active nests in Florida in 2005. Presuming two mature birds per nest provides an estimate of mature nesting bald eagles to be 2,810. It is estimated that 20% of the mature bald eagles do not participate in breeding in any given year (Buehler 2000). Based on this correction factor, the estimated total population of mature bald eagles in Florida in 2005 was 3,372 birds. The general threshold for listing at the SSC level is <10,000, while the general threshold for listing at the threatened level is < 2,500. The bald eagle would meet the general threshold for listing at the SSC level. However, to

meet requirements for listing under this criterion, the species must meet the general threshold AND one of two subcriteria that describe decline. Subcriteria C1 requires a continuing decline of at least 10% in the next 3 generations. This species has experienced a population increase, there is not a continuing decline, and there are no current projections for a 10% decline in the near future. Therefore, **this species does not qualify for listing via subcriteria C1.** Subcriteria C2 requires a continuing decline and either a) the number of mature individuals in each subpopulation to be < 1,000, or the % of individuals in one subpopulation to be 100%; or b) extreme fluctuation in the number of mature individuals. This species is not experiencing a continuing decline; therefore, this subcriterion is not met, and **this species does not warrant listing via criterion C2**.

Result: The species does not warrant listing based on criterion C, small population with decline.

Note: One point that should be considered in drafting the management plan is the potential impact of delisting at the state level on current protective regulations. When carefully reviewing criterion C (particularly subcriterion C1), it should be noted that if delisting results in a loss of protection that results in a 10 % decrease in the population, this species would once again warrant listing at the SSC level. Measures should be implemented to prevent this scenario from occurring, and these measures could be linked to the fact that this species is afforded the protection of the Federal Endangered Species Act (ESA), and even if delisted under ESA, the Bald and Golden Eagle Protection Act.

Criterion D: Very restricted population size

Criterion D identifies species with very small or restricted population size. A species qualifies for listing under criterion D if the population size of mature individuals is smaller than the threshold for the category of threat. A species must either have a population size < 1,001, or an area of occupancy < 8 mi^2 (20 km^2), or occur at < 6 locations to qualify for listing at the level of SSC under this criterion.

Based on the information provided in criterion C, the bald eagle population size (mature individuals) in Florida is estimated to be 3,372 which exceeds the threshold for listing under D1. Based on information provided in criterion B2, the bald eagle has an

area of occupancy exceeding 770 mi^2 (2,000 km^2), and occurs in at least 16 locations (using breeding clusters as locations), both of which exceed the threshold for listing under D2. Therefore, **this species does not warrant listing based on criterion D**.

Result: The species does not warrant listing based on criterion D, very small or restricted population.

Criterion E: Quantitative Analysis

Criterion E identifies species that have been modeled to have a high probability of extinction. A species must have had a quantitative analysis such as a Population Viability Analysis (PVA) conducted that indicates at least a 10% chance of extinction within the next 100 years to qualify for listing under this criterion.

Based on a lack of published models for bald eagles, the BRP is aware of no data that exist in the literature that suggest this species has a high probability of extinction. Therefore, **this species does not warrant listing based on criterion E**. The panel does suggest the management plan should reflect that performing a quantitative analysis to determine extinction risk be an appropriate action item for this species.

Result: The species does not warrant listing based on criterion E, quantitative analysis.

Regional Application

The regional assessment guidelines require a two-step process in which step one, the initial assessment, be conducted using regional data when conducting the analysis (this is detailed above). Step two then assesses potential impacts of the global or extra-regional population on the regional population and requires the imperilment level be adjusted if the global population impacts the extinction risk of the regional population.

The bald eagle was globally assessed as least concern (BirdLife International 2004). In the global assessment, the global extent of occurrence was estimated to be 3,320,463.32 mi (8,600,000 km^2) and global population was estimated to exceed 100,000 individuals. The global assessment noted the global population trends have not been quantified; however, the global assessment also noted the global population was believed

to be stable and not believed to approach the thresholds required under the rate of decline criterion.

Following the assessment procedure described in the Guidelines for Application of IUCN Red List Criteria at Regional Levels Version 3.0 (IUCN 2003), we evaluated the potential for extra-regional populations to affect the extinction risk of the Florida bald eagle population. The bald eagle is known to breed in Florida, so the answer to 2a in Figure 2 in the IUCN document is NO, the species is not a non-breeder. Based on the IUCN Figure, there are three possible outcomes to the regional evaluation for taxon that breed in the region. If the regional population experiences significant immigration from surrounding regions, the immigration is expected to decrease, **and** the regional population is a sink, the assessment would increase the imperilment risk category of the taxon. All BRP members agreed the Florida bald eagle population is not a sink, and therefore would not merit an increased imperilment category. If the regional population experiences significant immigration from surrounding regions and the immigration is not expected to decrease, the assessment would recommend downgrading the imperilment level. This species does not warrant listing in any of the imperilment categories, as the step one assessment suggested, and there is no lower imperilment category to which this species could be assigned; therefore, this option would have no impact. If the regional population does not experience significant immigration, the assessment would not alter the imperilment category; therefore there is no impact on the suggested listing category.

The regional guidelines suggest that in cases where there are both breeders and visiting non-breeders, there are two distinct subpopulations and each subpopulation should be assessed separately. As far as banding records have shown, the majority of bald eagles present in Florida during the breeding period (1 Oct –15 May) are either breeding adults, or Florida produced subadults and non breeding adults waiting to secure a breeding territory and enter the reproductive segment of the population. Since territory occupancy and defense can begin as early as late August and since most of the suitable habitat is already occupied (Figure 2) by Florida's resident population, it is unlikely that more that a few dozen non-breeding adult bald eagles would find Florida a suitable wintering location. As this is not a significant proportion of the bald eagle population, the panel agreed these bald eagles should not be evaluated as a separate subpopulation. If

anything, these birds could provide a potential "rescue effect" should some catastrophic event impact Florida's breeding bald eagles.

The members of the panel agreed there are currently no conditions occurring globally that would impact the imperilment level of the bald eagle in Florida. While Florida's bald eagles do leave the state and have the potential of being negatively impacted by events/conditions occurring out of the state, this type of impact is not currently occurring, and is not expected to occur in the near future. After reviewing the potential impact of the southeastern bald eagle population or the global bald eagle population on Florida's bald eagle population it was determined there was no plausible extra-regional impact that warrants altering the imperilment classification identified by the quantitative assessment.

Review Summary

This species does not meet any of the FWC criteria for listing, and therefore warrants consideration for removal from the Florida list of threatened species. The IUCN Guidelines suggest a species should only be moved from a category of higher imperilment to a category of lower imperilment if it is known that none of the criteria for the higher category have been met for at least five years. The panel agrees the bald eagle has not met the criteria for listing for at least 5 years. This is based on the fact that in the year 2000, there were 1,069 documented active territories covering a large portion of the State and the population was increasing. As such, none of the thresholds would have been met in 2000.

The BRP members unanimously agreed there was no biological justification for recommending a listing classification that differed from the biological assessment. All agreed there is no significant global impact on the population that would warrant altering the imperilment classification, and all agreed the bald eagle warrants removal from the threatened species list in Florida.

LISTING RECOMMENDATION

The BRP unanimously recommends removing the bald eagle from the threatened

list (68A-27.004) due to the fact that the bald eagle does not meet any of the criteria for listing found in 68A-1.004, and the fact that the bald eagle has exceeded the recovery goal for breeding pairs in Florida. It was unanimously agreed there is no biological justification for recommending a classification that differed from the quantitative assessment.

PUBLIC INPUT

Public input was sought on the biological status of the bald eagle prior to conducting the biological assessment in accordance with the guidance of 68A-27.0012. A request for public comments was advertised in the Florida Administrative Weekly, on the FWC home page, and via an FWC press release. Public comments were received from July 15, 2005 through August 31, 2005. Two replies were received during the public comment period and the input received is summarized in Appendix 1.

SUMMARY OF THE INDEPEDENT REVIEW

The Draft Biological Status Report for the bald eagle was sent to five scientists for independent review on December 20, 2005. All five reviewers responded to our request for review, and all generally supported the information used and the way it was interpreted, the justifiability of the assumptions used, and the reasonableness of the BSR's conclusions (Appendix 2). None of the reviewers disagreed with the conclusion that removal of the bald eagle from the Florida list of threatened species is warranted. Appendix 2 contains the comments submitted by the reviewers. Additionally, several of the reviewers submitted minor editorial changes to the text of the draft BSR, most of which were incorporated into the final BSR. The members of the BRP thank the independent reviewers for their assistance, time, and input.

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Appendix 1. Summary of information received during the public input period of July 15, 2005 through August 31, 2005.

Kristoffer Bowman, Ecologist, August 23, 2005

> Noted eagles seem to be "fairly resilient" in the face of pressure, but continue to rely on habitat protection standards from regulatory agencies. Mr. Bowman noted that the rate of intra-specific aggression in eagles may result in nest failure, and that inter-specific competition, especially with great-horned owls, can also result in nest failure. Mr. Bowman stated "Florida's bald eagle population appears to be doing very well", but that "habitat protection is still required."

Eric Draper, Policy Director, Audubon of Florida, August 31, 2005

> Stated that Audubon of Florida is very concerned that rapid development in bald eagle habitat across the state could outpace the impressive population gains over the last three decades. Expressed concern that lessened protection for nesting territory habitats and the cumulative habitat losses from development could conceivably begin reversing recent eagle population gains. Stated that the recent slowing of the eagle population growth supports this possibility. Noted that many of the known eagle territories in Florida were impacted by hurricanes in 2004, and stated that the combination of these circumstances do not supported changing the listing status of the bald eagle in Florida.

Appendix 2. Information received from the independent reviewers. Statements addressing the quality of the review are highlighted for the convenience of the reader. All information is copied directly from the reviewer's replies and therefore, format will differ between reviews.

Kushlan, Dr. James, IUCN Species Survival Commission

I have reviewed the Draft Biological Status Report for the Bald Eagle dated Dec. 19 2005. The report concludes that the Bald Eagle no longer meets criteria for listing at any level. The Report details an evaluation of the biology and status of adult bald eagles in Florida against the international standards of the IUCN Red List criteria. I find that the evaluators conducted a scientifically accurate review using the criteria in an appropriate manner.

I do have several comments and suggestions, related to 1) this review, 2) similar reviews, and 3) management of the Bald Eagle in Florida. 1) It is unclear from the text how the metric 'average distance between nests' was calculated, and it is unclear as to the justification for using the resulting figure as the radius to calculate the species' occupancy area. Lacking stated justification for the view that an eagle's actual home range is half the distance to the next nest, it would seem that the eagle's average home range should be determined by biological field study. The Report does quote such as study. Given that the study produced a value similar to that calculated using average distance, the use of this metric did not effect the result. However, without further justification of the use of this metric, the literature value might be more acceptable. 2) IUCN criteria use the metric system. Analyses should be conducted in the metric system. 3) This is a species known to have decreased rapidly in the past. Therefore, it is essential that the State of Florida sponsor a monitoring program sufficient to detect a decline at or exceeding the rate of 10% per 36 years (Criterion C). Given the limited information available on population modeling (Criterion E), the State of Florida should sponsor a population viability analysis of its Bald Eagle population, and periodically re-run the model based on the results of its continued monitoring program.

Millsap, Brian, Chief, Div. Of Migratory Bird Management, U.S. Fish & Wildlife Service

Attached please find my comments on the BSR for the bald eagle. In addition, in a separate e-mail I will send the results of some modeling work I did that support's the group's calculations of bald eagle population size. You specifically asked for my comments on the following two questions, and below each I provide my answer in bold:

(1) the completeness and accuracy of the biological information and data analyses

in the BSR

The BSR is relatively complete and accurate. I have provided a few minor comments in the body of the BSR, but none of these comments would change the team's conclusions.

(2) the reasonableness and justifiability of our assumptions, interpretations of the data, and conclusions

The assumptions, interpretations, and conclusions are reasonable and consistent with the data reviewed.

In short, I concur with the team's findings.

I appreciate the chance to play a part in this process. Please feel free to contact me if you have questiosn on my review.

Murphy, Tom, South Carolina, Dept. of Natural Resources

1) I concur with the assessments of the BRP and agree that removal from the threatened status is justified under the criteria used. I farther agree that the population is currently biologically secure.
2) It is interesting although not surprising that the Florida population is the only state population in the southeast that would qualify for change of status under all the criteria of IUCN.
3) There is no mention of State or county protection of eagles or their habitat. With the pending federal delisting (moving at glacial speed) one would wonder if adequate safe guards are in place.
4) I was surprised at the lack of attention towards shooting mortality, given that in the 1960's 60% of eagles found dead were shot. The national average is currently around 15%. With the fanfare of both state and federal reclassification it seems likely that shooting will increase. Although pesticides were the final blow to eagles in the lower 48, it is clear that the population was already severely depleted at the time the BGEPA was passed in 1940.
5) Given deferred maturity, low reproduction rate and a demonstrated vulnerability to shooting and chemicals, an adequate management plan should be in place. Monitoring should include monitoring the sources and extent of mortality. With a 24+% minimum rate of unfound nests, nest monitoring alone would not be sensitive enough to detect significant declines in the population.
6) There is an assumption that the nesting population has leveled off because the available territories are occupied. I did not see any density data-average or maximum by habitat type to support that claim. A 6% increase in nesting is only 120 adults for a 1000 nest population. A small increase in mortality could reverse the observed annual increases.

Todd, Charlie, Wildlife Biologist, Maine Dept. of Inland Fisheries & Wildlife

I appreciate the opportunity to review the biological status report for bald eagles in Florida and recommendation for state delisting. In summary, removing bald eagles from the state list of Threatened species is clearly warranted in Florida relative to established listing guidelines. These thresholds often guide delisting of species unless formal recovery criteria are established.

The following points are offered as general comments about delisting, very minor edits to the report, and shared experiences relative to our recovery program for bald eagles in Maine:

General comments / discussion:

- The overall abundance, broad distribution, and recent trends of Florida's bald eagle population all infer species recovery. Neither IUCN guidelines nor population models justify continued listing of the current population.
- Species recovery and delisting are infrequent events in wildlife conservation programs. State agencies have very diverse procedures for species reclassification.
- Like Florida, we emphasize biological criteria for listing species under Maine's Endangered Species Act. No species have been delisted here to date, but we anticipate future delisting of bald eagles **based upon recovery criteria** above and beyond the biological criteria prevalent in our listing guidelines.
- Specific recovery criteria (see Enclosure #1) for bald eagles in Maine have been in place since 1989. The delisting target for population abundance concurs with that suggested for Maine under the Northern States Bald Eagle Recovery Plan. However, additional objectives for delisting eagles in Maine under state law include federal delisting, levels of eaglet production, lack of recent declines, and achieving a degree of habitat protection.
- In the last month, I have polled six of eight states with larger breeding populations of bald eagles than that in Maine (= 385 nesting pairs in 2005). Two have already delisted bald eagles under state law: Minnesota (1996) and Wisconsin (1997). Three (Maryland, Michigan, and Washington) plan to undertake species reclassification after delisting under the U.S. Endangered Species Act. Only Virginia reports "no intentions" for state delisting based largely on future habitat threats.
- I am sure most will agree with the FWC draft status report (page 4, "Threats") that future habitat trends are the ultimate concern for nesting eagles, especially along the Atlantic seaboard where private ownerships are prevalent for most eagle nests.
- Concerns for setbacks attributable to future habitat loss or degradation warrant continuing attention: either as a management strategy, a focus of future monitoring, or a "relisting trigger." In 2004, a public working group updated species goals and objectives for Maine eagles over the next 15 years. Their recommendations (see Enclosure #2) are the first attempt to look beyond Endangered / Threatened status and recovery programs for bald eagles in Maine. Strategies to safeguard eagle recovery were a clear focus of that effort.

As in other jurisdictions, future monitoring strategies may be less intensive and frequent but sampling efforts in Maine will test for divergence of productivity, occupancy rates, or overall trends in abundance / distribution on "protected" sites (conservation lands and easements or management agreements) versus those in "unprotected" habitats.

- While assisting a pilot test of "dual-frame surveys" in Florida during 2005, I certainly witnessed adaptive tendencies of nesting eagles that are less familiar than in Maine. However, the long-term persistence of nesting eagles in rapidly developing settings is less certain if one assumes **diminished management attention in the future**.

Specific comments / edits:

- FWC draft status report page 3 ("Life history & habitat requirements" par. 1): Successful recovery trends and the original proposal to delist (*Federal Register 64: 36454 – 36464)* are rangewide across the continental U.S. (throughout the lower 48 states), not just the region south of the 40th parallel.
- FWC draft status report page 4 ("Life history & habitat requirements" par. 4): Spell change in 4th sentence = "dominant" tree, not "dominate."
- FWC draft status report page 4 ("Life history & habitat requirements" par. 5): Change to great "blue" herons, not great "white" herons.
- FWC draft status report page 5 ("Historic distribution" par. 1): Suggested insert as 2nd sentence = "As of 2005, resident bald eagles are nesting in all of the lower 48 states." [Note: Nesting eagles were first documented in Rhode Island during 2003 and Vermont during 2005. The comment only reinforces overall species recovery.]
- FWC draft status report page 6 ("Threats" par. 1): Suggest insert a sentence at end = "Elevated mortality is an even greater concern in eagle population dynamics." [Note: The comment is widely accepted (*e.g.,* Grier 1979, 1980) and eases the transition to a subsequent discussion of mortality factors among eagles in Florida.]
- FWC draft status report page 8 ("Criterion A: Rate of decline - *Criterion A.3*"): The phrase "this species is likely to persist **if adequately protected**" in the 5th sentence should either be clarified or eliminated. Subsequent statements imply that a 30% decline is unlikely within 36 years … regardless of "protection" or are there assumptions about the role of the Bald Eagle - Golden Eagle Protection Act and other regulations?
- FWC draft status report page 11 ("Criterion C: Small population and decline" par. 2-3): The sub-criterion "C.1" functions as a threshold for listing as the SSC level **if future declines** arise and are sustained at the level of 10% within a 36-year period. It seems prudent to formally label this as a "relisting trigger" and note that such trends would likely be detected by future monitoring strategies required after federal delisting. The U.S. Endangered Species Act requires post-delisting monitoring for **at least 5 years**; the strategy for bald eagles will certainly be over a much longer time period, not yet specified.
- FWC draft status report page 11 ("Criterion C: Small population and decline" par. 3): I would discourage crediting protection from the federal Endangered Species Act as a safeguard if bald eagles are delisted in Florida since federal delisting seems inevitable. Alternative scenarios are forecast for eagles in the Chesapeake Bay: see Watts, B. D. 2000 - "Removal of the Chesapeake Bay bald eagle from the federal list of threatened and endangered species: context and consequences," William and Mary College, VA. 20pp.

The recovery of bald eagles is certainly a major accomplishment for wildlife agencies and Endangered Species programs: especially in Florida where eagle numbers have soared despite intense challenges. I do not think we are "out of the business" with regard to future habitat stewardship for bald eagles, but it is time to transition the efforts out from the realm devoted to Endangered and Threatened Species.

Wood, Dr. Petra Bohall, USGS West Virginia Cooperative Fish & Wildlife Research Unit

I have reviewed the status report and evaluated it for the 2 criteria requested:

(1) the completeness and accuracy of the biological information and data analyses in the BSR, and
(2) the reasonableness and justifiability of our assumptions, interpretations of the data, and conclusions.

In general, I commend the authors on the quality of the report. It was very well written, complete and accurate. Assumptions were well documented and justified, interpretations of the data were accurate, and conclusions drawn were supported by the data. The listing recommendation is well supported.

I have made a few specific comments in the document (they are made with track changes function in Word) and are listed below.

1) Under "Life history and habitat requirements" section, I added 2 references to indicate the source of the data presented.

2) Under Criterion A, I agree that the increase in the number of active territories is a positive response and supports that the species does not warrant listing. However, I think it would be important to look at the % of territories that were successful each year. If the # of terrs is increasing but success going down, that could be an early indicator that something is happening in the population. Because juveniles have high mortality, reduced nesting success could be a problem for the population or for subpopulations. I think this needs to be addressed somewhere in the document.

3) The note under Criterion C regarding loss of protection from current regulations if the spp is delisted is very important to consider and I'm glad this was addressed.

4) I added the 2 references to the lit cited section

5) One of the public comments mentioned impact from hurricanes. I think it would be a good idea to address this in the document as well. I recently reviewed a draft paper by Watts and Byrd that evaluated effects of Hurricane Isabel on Ches Bay bald eagles. They documented reduced nesting attempts, success, and brood size. It would be worth following up with them to incorporate their info into this status assessment. Again more as an informative cautionary item.

Figure 1. Estimated Extent of Occurrence for the bald eagle in Florida based on use of the minimum convex polygon method being applied to known active nests.

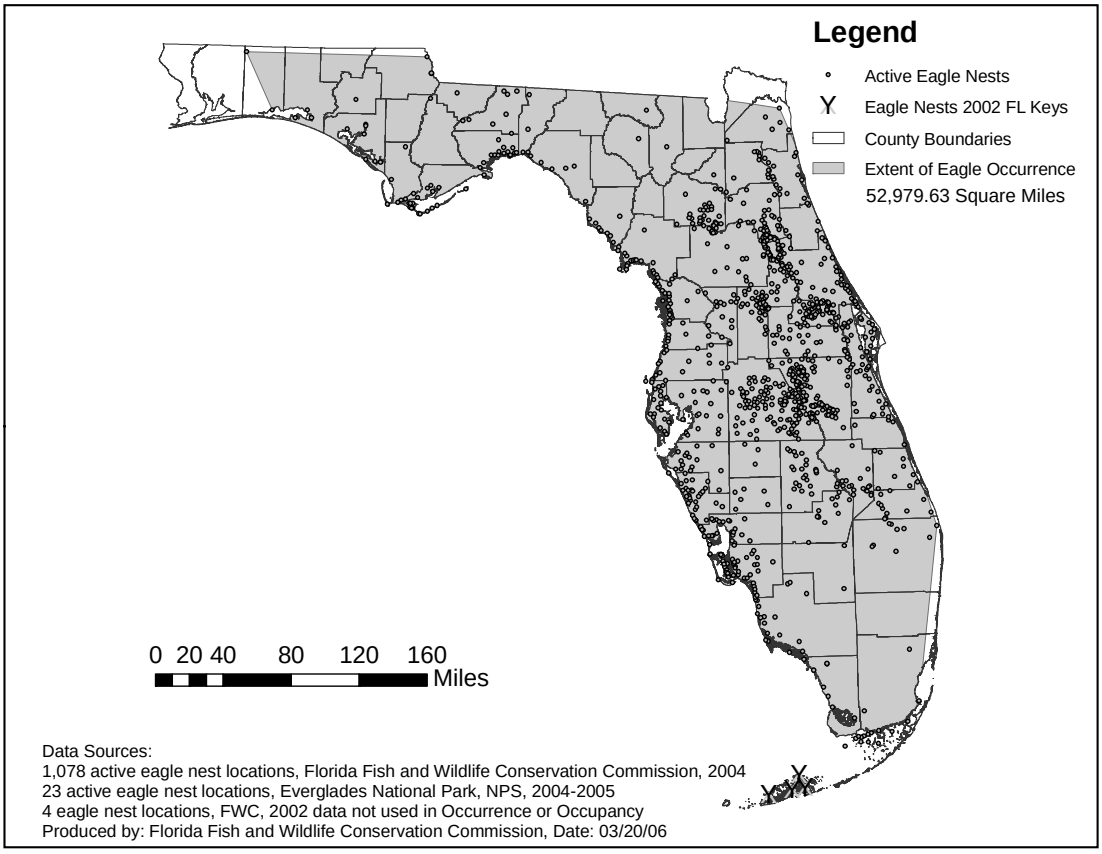

Figure 2. Estimated Area of Occupancy (AOO) for the bald eagle in Florida. The minimum AOO is based on the use of a nest territory of 0.62 mi^2 being applied to known active nests, while the maximum AOO is based on the use of a nest territory of 1.24 mi^2 being applied to known active nests. In both estimates, were territories overlapped, the buffers were merged to avoid an overestimate.