



# ENDANGERED SPECIES TECHNICAL BULLETIN

Department of the Interior • U.S. Fish and Wildlife Service • Endangered Species Program, Washington, D.C. 20240

## Special Report:

# FUTURE OF DUSKY MAY DEPEND ON CAPTIVE PROPAGATION

U.S. Fish and Wildlife Service Photo



Heavily streaked with black, with a yellow stripe outlining its bill and wing, the brown 5-inch long dusky seaside sparrow may be North America's rarest bird. This male (shown in aggressive posture typical of the March-July mating season) is one of only 13 known to occur in 1979 within the dusky's remaining range. Experts will comb suitable habitat in Florida's Brevard County this spring in the hope of finding nesting activity and females—unobserved since 1976.

While apparently never abundant nor widely distributed, Florida's dusky seaside sparrow (*Ammodramus maritimus nigrescens*) is now ranked among the Nation's most critically Endangered species. The subspecies has disappeared from once-suitable habitat on Merritt Island on the east coast of Florida, and last year's surveys of the bird's remaining range near the St. Johns River turned up only 13 singing males. Since 1976, experts have failed to identify a single female.

The 1980 survey will soon be underway. But in the meantime, Florida and Federal officials are now considering captive breeding as possibly the only recourse to the dusky's recovery.

### Emergency Strategy

This April, personnel from the Fish and Wildlife Service, Florida Game and Fresh Water Fish Commission, and Florida Audubon Society, will cooperate in an exhaustive survey to learn precisely how many duskies remain. Utilizing helicopters for access and optimum manpower, all potential habitat—some 25,000 acres in the St. Johns River Basin—will be surveyed using tape recorders and other techniques to seek out all surviving duskies, especially in the hope that females and evidence of nesting may be found.

Duskies generally breed from March to August, with two egg-laying peaks in late April to early May and late June

to early July. Should an active nest be found this spring, any young would likely be taken (and hand-reared) at the age of 4–5 days, which should then induce the laying of a second brood, or “double-clutching.” Extra precautions would be employed to protect any nests found, as the eggs and young are especially susceptible to predation.

Jim Baker, wildlife biologist for the Service’s Jacksonville Area Office and team leader for the Service-appointed Dusky Seaside Sparrow Recovery Team, says team members have discussed the possibility of captive propagation for several years. “We kept hoping that we had missed a colony and that surveys would reveal additional birds.” With no reproduction recorded since 1975 and dusky numbers continuing to plummet, the team now sees no alternative to a captive breeding program. Unless by June the results of this year’s survey show promise, drastic action may have to be taken if this sparrow is to survive and recover to the point where it can again become a viable component of its ecosystem.

With this view in mind, the Florida Game and Fresh Water Fish Commission recently requested authorization from our Service to take remaining wild dusky seashores into captivity in an attempt to promote breeding and to “buy time” by increasing the bird’s longevity through safe-keeping. Should the Service approve Florida’s plan, the dusksies will be captured in mid-July and placed in the care of specialists at Florida’s Gainesville research laboratory.

According to Dr. Will Post, hired by the State to guide its captive breeding effort, 22 Scott’s seaside sparrows (*Ammodramus maritimus peninsularis*)—including 5 hand-reared last year—are now in captivity at the Gainesville laboratory to test the feasibility of captive breeding this closely related race. Nine pairs are showing signs of breeding, and Post hopes to have eggs by the first of April.

Captive maintenance has already been accomplished with northern seaside sparrows (*A. m. maritimus*), and it has been shown that wild seashores can adapt more readily to captivity if a few captive sparrows have been previous aviary occupants and can tutor the wild birds. (Post believes that Scott’s seashores as well as three dusksies taken into captivity last year—two males and a bird whose sex is yet to be determined—could help acclimatize newly-introduced dusksies.)

With two-thirds Federal matching fund assistance from our Service, Florida is now readying propagation facilities to house dusksies under the most natural, yet sanitary conditions possi-



A broad, open horizon with little brush is ideal habitat for the dusky seaside. The subspecies prefers cordgrass with ponds and pans scattered throughout a moist savanna.

Fish and Wildlife Service Photo

ble. Stands of native grasses will be planted in the aviaries, with a central feeding area to be flooded periodically to simulate a tidal saltmarsh environment. Separate pens are being constructed to minimize mortality from infectious disease or catastrophe, and every imaginable precaution would be taken to preclude risks to the surviving population of dusksies.

To supplement their knowledge about seaside sparrows, Florida is also conducting literature searches and ecological studies of the Scott’s seashores in the hope of better understanding its requirements and limiting characteristics. (About 250 of these sparrows have been banded this year as part of the State’s plan to learn more about the role of predators, wildfires, pesticides, and other mortality factors that might give us better insight into dusky management.)

**Life History and Declining Factors**

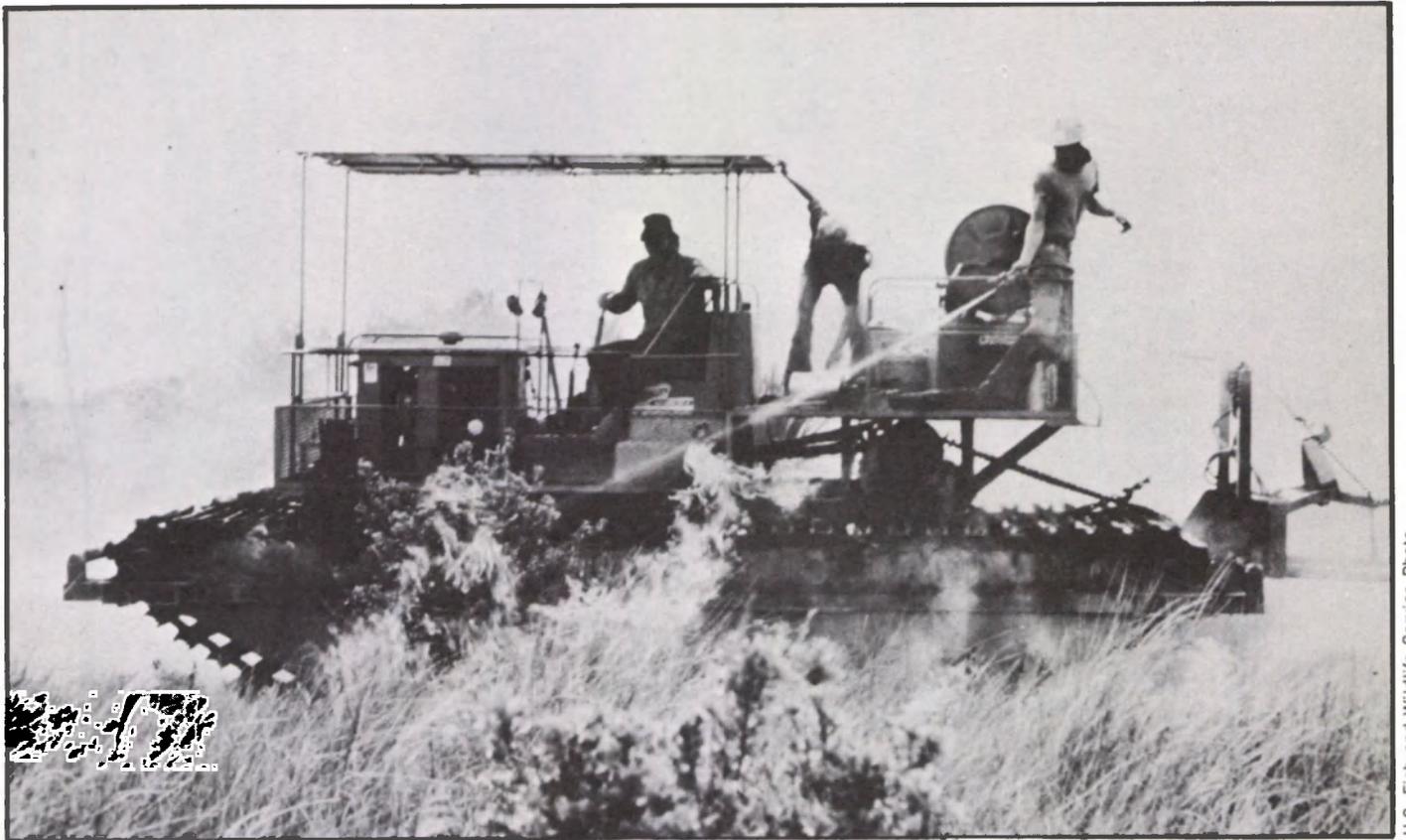
The dusky is one of several subspecies of seaside sparrow native to

Florida—all of which are apparently on the decline due to loss of coastal marsh habitat. The Smyrna seaside sparrow (*A. m. pelonota*), once native to the New Smyrna Beach vicinity, is believed extinct, while the Cape Sable seaside sparrow (*A. m. mirabilis*)—occurring in the Everglades—is federally-listed as Endangered. Another race, the aforementioned Scott’s seaside sparrow, occurs in stable populations on the west coast of Florida.

The dusky’s past known distribution includes portions of Merritt Island (mostly within the Service’s Merritt Island National Wildlife Refuge) and, on the mainland, remnant brackish marshes in the St. Johns River Basin within and south of the St. Johns National Wildlife Refuge. (The dusky’s former range is indicated on the accompanying map.)

• **St. Johns**

Drainage (primarily for agriculture) has altered the water table in the upper St. Johns Basin, and much of the



St. Johns Refuge workers use a marsh buggy to set and control fires to maintain the preferred cordgrass habitat.

U.S. Fish and Wildlife Service Photo

two individuals.)

#### Habitat Management Key to Recovery

Whether left to chance in the wild or bolstered through captive propagation, recovery of the dusky seaside sparrow will ultimately depend on the availability of suitable habitat to support it. As recommended by the Dusky Recovery Team, a number of measures are necessary to maintain and develop existing and potential habitat for this uniquely adapted subspecies.

Taking into account the dusky's preference for an "unbroken horizon," the St. Johns Refuge fire management plan calls for prescribed burning in a checkerboard pattern to simulate past conditions. Refuge personnel are also manually removing brush and palm trees (which the dusksies shy away from apparently to avoid predators) within the sparrow's range.

Other components of the habitat management plan on St. Johns NWR include:

- vegetation control using herbicides (2-4-D is apparently successful in controlling the spread of woody vegetation).
- water level monitoring (dusksies prefer a fairly moist habitat, which inhibits the growth of woody vegetation as well as wildfires).
- blackbird control (red-wings have become abundant in the area with the encroachment of *Baccharis* and other

woody plants. Attempts are being made to control red-wings in the approximately 600 acres within the dusky's present range, as the territorial blackbirds harass and compete with dusksies, especially during the breeding season.)

In addition, the Service has purchased selected parcels (amounting to about 2,000 acres) within the "Beeline Tract" in the hope of preserving this valuable habitat, where 6 male dusksies were sighted in last year's survey. Plans call for the fencing of these areas as well as portions of the St. Johns Refuge to preclude disruption by cattle in adjacent pastures. The refuge is now closed to the public because of the dusky's sensitivity to human disturbance.

(The conflict between mosquitos and the dusky's stringent habitat requirements have made conservation extremely difficult on Merritt Island, where high water levels and consequent vegetation changes have unfortunately precluded any success with restoration measures thus far.)

#### Artificial Insemination/Semen Storage

The feasibility of captive-breeding the Endangered dusky seaside will, of course, largely depend on the results of this year's survey. If a female should be found, then every possible attempt would be made to promote breeding. Should the birds be taken into cap-

tivity, and should they fail to breed in these semi-natural conditions, technology developed at the Service's Patuxent Wildlife Research Center to boost the fertility of whooping cranes and other Endangered populations may give us additional options.

Using Scott's seaside sparrows as surrogates, Dr. George Gee at the Patuxent Center plans to study the physiology and breeding behavior of these birds to perfect techniques for artificial insemination and semen preservation that could be used with the dusky.

We now know that maintenance of genetic diversity is especially critical to declining populations, as it is this pool of material that enables an animal population to adjust to changes in the environment. As Darwin discovered (1859), each species has an inherent amount of variation, modified throughout its evolution by natural selection to permit its survival. Although captive propagation of a small remnant population may insure the survival of a species for many generations, it inevitably leads to a loss of genetic diversity.

Methods for the collection, insemination, and preservation of semen have never been developed for passerine birds. Under his current proposal, Gee will establish a flock of Scott's searises in facilities at the Patuxent Center in Maryland where semen collection, artificial insemination, and day-length manipulation methodolo-



U.S. Fish and Wildlife Service Photo

*This blackened mass is the aftermath of the 1975 wildfire that destroyed most of the remaining dusky habitat on St. Johns.*

dusky's habitat has been converted to pasture and areas better suited for housing and roads. Where the total mainland dusky population was estimated at nearly 900 in 1968 (having been rediscovered only a few years before), possibly no more than a dozen individuals remain today.

Biologists speculate that the birds evolved in a saltmarsh environment subjected to frequent but self-contained lightning fires occurring in the rainy season, when the marsh is wet and the humidity high. Although natural fires seem to play a beneficial role in maintaining dusky habitat (primarily by eliminating woody vegetation); winter wildfires have contributed to population reductions. Ranchers frequently burn cordgrass to improve pastures, but the fires often run wild, displacing duskies to nearby areas outside their preferred range. A catastrophic fire in 1975 destroyed most of the remaining habitat in the vicinity of the St. Johns Refuge (after which only 11 of 47 males survived), and many believe it signalled the dusky's demise.

#### • Merritt Island

Dusky seaside populations were probably stable on Merritt Island prior to the mid-1940's, when several thousand birds were estimated to inhabit these marshes. The impoundment of marshes on the island from 1945-1955 (for mosquito control) and subsequent changes in the saltmarsh vegetation reduced the population to four colonies totalling 70 pairs in the early 1960's. By 1977, only two males were located on Merritt Island, and none in a 1978 survey.

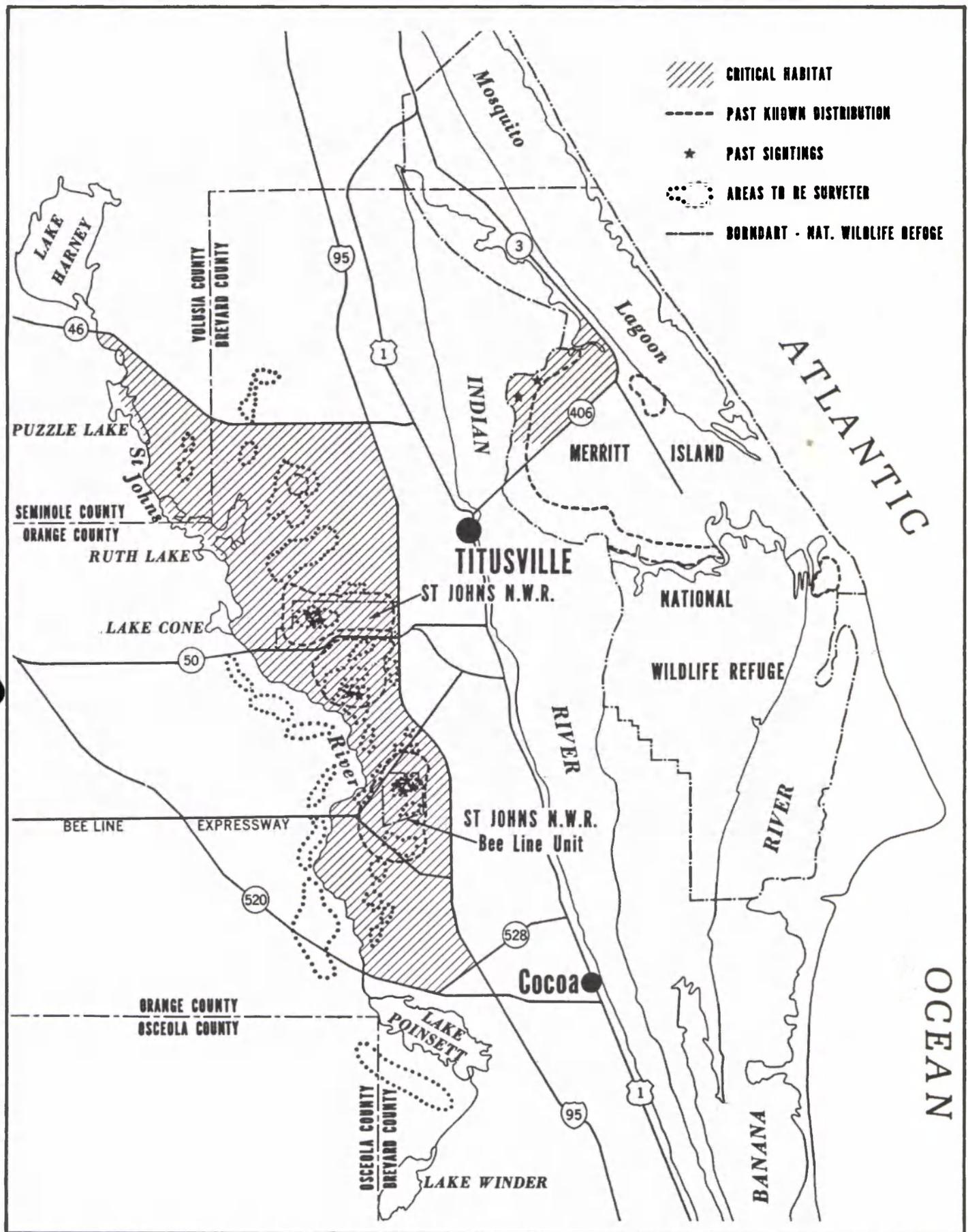
While in recent times mosquito control has been a necessity on Merritt Island, a number of experts expressed concern over the impacts of insecticide use and water control measures shortly after the dusky was listed as Endangered under 1966 legislation. But conservation efforts on Merritt Island were complicated by a number of factors.

For one thing, management of the refuge has been a cooperative venture, as Merritt Island is managed for fish and wildlife resources by our Service, but is owned by the National Aeronau-

tics and Space Administration (NASA). A third managing agency, Brevard County, also shares responsibility on refuge lands for mosquito control purposes.

(Jack Salmella, head of the County's mosquito control program, urged the Service to assess the possible impacts of impoundment and other control measures late in the 1960's. Subsequent Service studies showed that constant water levels destroyed cordgrass on which the dusky depends. A dike was removed, but too little was done too late.)

Many concerned with the decline of the dusky attribute its extirpation from the island to a mood of complacency—at one time looking to former St. Johns population levels as a hedge against extinction. Still others say conservation efforts failed because the dusky just was not "glamorous" enough to worry about. (The State designated a dusky seaside sparrow awareness month back in 1976, but a subsequent Service publicity conference engendered the interest of only



The dusky seaside sparrow once ranged in portions of Merritt Island and throughout the St. Johns River Basin. The last recorded sightings on Merritt Island (1977) and in the vicinity of the St. Johns NWR (1979) are shown above—all occurring within the area designated on August 11, 1977, as Critical Habitat for the dusky. This year's survey effort will focus on suitable habitat near the St. Johns River.



*Drainage of the upper St. Johns River Basin for agricultural purposes has altered the hydroperiod—no longer sufficient to maintain marsh habitat.*

gies can be tested. As part of the plan, Gee will try to develop optimum techniques for cryogenic preservation (frozen storage) of sparrow semen—a delicate process that may take three or more years to perfect—which could allow us to preserve the remaining dusky gene pool. The establishment of a dusky sperm bank would then not only provide frozen material to supple-

ment fresh semen for insemination of females (should they be found this year or in the future); it will also allow the use of this frozen semen in generations to come, thereby off-setting the unavoidable effects of inbreeding with such a small captive population.

Without the development of a healthy, "adaptable" population of duskies, further habitat management,

land acquisition, and other recovery measures could in the end prove futile. In the meantime, however, habitat restoration and other management precautions will be accelerated in the hope of eventually restocking captive-reared duskies to suitable habitat in their historic range.

**Comments Solicited**

Florida's request for an amendment to its existing permit—allowing the possible removal of all remaining dusky seaside sparrows from the wild (in addition to the 3 now in captivity)—was published in the March 25, 1980, *Federal Register*.

While the comment period for this permit application officially expires April 23, 1980, the Service wishes to encourage the interested public to comment on this proposal through the duration of the spring survey effort. In recognition that capture of these individuals could place the entire remaining population of this subspecies under human care, every possible alternative course of action (concurrent with initial survey results) will be considered before a decision is made concerning the taking of duskies from the wild. Concurrence of the Service's Atlanta Regional Director would also be sought before any taking of nestlings or adult birds. Moreover, an intra-Service consultation on the matter must be completed in accordance with Section 7 of the Endangered Species Act before any final action on the permit request.

Kindly forward comments to the Director (WPO), (reference file number PRT 2-4329) U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.



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