

# 2000 PEREGRINE FALCON MIGRATION STUDIES AT ASSATEAGUE ISLAND, MD/VA

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AINS (NPS) NATURAL RESOURCE STUDY PERMIT ASIS-2000009  
CHINCOTEAGUE NWR (USFWS) SPECIAL USE PERMIT 80879  
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VIRGINIA THREATENED/ENDANGERED SPECIES PERMIT 014851  
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## SUMMARY

As part of a continuing research program for the Department of Defense's Legacy Resource Management Program, field studies were conducted on the peregrine falcon, *Falco peregrinus*. Study sites were Assateague Island, MD/VA, and Padre Island, TX. This report focuses on the 31<sup>st</sup> annual study at Assateague Island.

Between 21 September and 18 October the survey team expended 537 man-hours in the field, observing 522 peregrines and capturing 155 different individuals (table 1). Of the total captured ten were previously banded falcons. Resightings of individuals captured during the survey numbered 80 and recaptures 9. All sightings of resident peregrines were excluded from data presented here. During the survey 163 merlins (*Falco columbarius*) were observed.

## BACKGROUND

The presence of peregrine falcons on Assateague each autumn was confirmed by falconers in 1938. Most of these were *Falco peregrinus tundrius*, a migratory Arctic nesting subspecies. Some few individuals of the subspecies *Falco peregrinus anatum* were also determined to occur on Assateague in the fall. These anatum peregrines were known to breed on rock faces in the eastern United States.

Catastrophic declines in global peregrine populations after the mid 1940's were attributed to widespread use of chlorinated hydrocarbons (such as DDT) as agricultural pesticides after World War II. Food chain contamination resulted in high levels of DDE (the principal metabolite of DDT) in the tissues of peregrines, which caused the formation of thin eggshells and increased reproductive failures. The *anatum* peregrine was extirpated east of the Mississippi River and only remnant populations survived elsewhere in temperate North America. By the late 1960's the *tundrius*, or tundra peregrine was also in rapid decline and both subspecies received endangered species status in 1970.

Diverse efforts were undertaken to study, monitor and augment peregrine populations. Assateague Island, as a major focal point of the autumn tundra peregrine falcon migration, had been monitored for the preceding three decades by falconers, bird banders and scientists. In 1970

the Department of the Army initiated a program to monitor the tundra peregrine and develop new technologies to assist in the study of highly migratory threatened, endangered and sensitive species. The program rapidly expanded to include research in diverse geographic regions to assess all aspects of the natural history of the tundra peregrine, and specifically the issues associated with global contaminants affecting their population dynamics. We are presently using new and innovative technologies to examine the wintering biology of this subspecies and dramatically extend our knowledge of this macropredator during its wintering period in the Neotropics.

## METHODS

Our study area on Assateague Island, MD/VA, consists of the following domains: Assateague Island National Seashore (NPS, MD/VA), Chincoteague National Wildlife Refuge (USFWS, VA) and Assateague State Park (MD). From 21 September through 18 October the island was normally traversed each day from sunup to sundown by two parties in four-wheel-drive vehicles. The island was divided at the state line and each area to the north and south was surveyed in the morning by single vehicles, which switched sides of the island at midday. All raptors observed were recorded according to species, time, location and activity at time of sighting.

An attempt was made to capture peregrines encountered during the survey which were not identified through color marking as duplicates and which were found in areas conducive to trapping. Unbanded peregrines were fitted with a USFWS lock-on band (size 6 for males and 7a for females) and processed according to current research protocols before release at the capture site. Past protocols have included recording weight and body measurements, collecting small feather snips, pollen samples from plumage, and 2cc blood samples, affixing color-coded alpha-numeric bands, and attaching conventional and pulse-coded transmitters. Since 1993 we have also deployed Platform Transmitter Terminals (PTTs) on a small sample of adult peregrines, which were tracked and located globally by polar orbiting satellites. Before each falcon was released the head was marked with red dye. This identified the individual as one already sampled during the survey and precluded recapture attempts; it fades quickly over a four-week period.

## RESULTS AND DISCUSSION

The total of 522 peregrines sighted (table 2) was 15<sup>th</sup> highest in the 31 years of the survey, and sightings per 10 man-hours 13<sup>th</sup> highest. The 155 captures were 10<sup>th</sup> highest overall, and captures per 10 man-hours were 11<sup>th</sup> highest. A predominance of northerly winds and a complete lack of precipitation during the period when higher numbers of migrants historically pass Assateague adversely affected our sighting and capture success.

We are awaiting details from the USGS Bird Banding laboratory on the ten recoveries of previously banded falcons. As was the case in 1999, we strongly suspect the adult female outfitted with satellite-received telemetry in 1996 and captured again in 1997 and 1998 was back on her McCabe Tract territory. An adult was continually present in the area she frequents, but could not be captured due to lack of vehicle access to that area. This year she exhibited territorial aggression towards other adult females.

Adults comprised 20.79% of identified individuals sighted (table 3), exceeding the 31-year average of 14.31%. The disparity in sightings by age class lies in the differences in migration strategies between immatures and adults, and even between adult females and adult males. The latter class must comprise close to a quarter of the migrants, yet this year we confirmed the observation of only 11. Weather during the migration also compounds the consequences of these differences in migration strategies, so the sighting ratios may vary wildly from year to year.

Sightings and captures by sector (table 4) warrant some discussion. The McCabe Tract's major washover zones feature beach to bay sand flats in some areas. This is favorable habitat for migrating peregrines in the autumn as well as good breeding habitat for the endangered piping plover (*Charadrius melodus*). In 2000 the Seashore permit continued to limit our operations to the beachfront of the McCabe Tract due to the occurrence in several locations of the federally threatened and Maryland endangered plant Sea Beach Amaranth (*Amaranthus pumilus*). This limits our sighting and capture potential, and makes the occurrence of foot traffic and NPS vehicles along that same beachfront more debilitating to our prospects during those events. Accordingly, in 2000 this sector dropped to our third most productive in terms of sightings. The McCabe Tract did edge out the

Hook as second best in terms of capture productivity due to its much lower incidence of public visitation.

Because of its very narrow beachfront, development and public use, the Assateague State Park is seldom utilized by migrant peregrines; we spent less than three hours there. The Maryland Beach continues to widen somewhat due to erosion westward of the dune line, with significant washover areas where sand and water have taken out or buried vegetation. The Refuge Beach in Virginia is generally narrower and less conducive to effective capture attempts due to a more intact barrier dune system, yet productivity there was higher than on the Maryland Beach. This was probably due to the very intensive public use of four-wheel drive vehicles on the Maryland Beach. The Hook's suitability for observing and capturing peregrines is still tied to the amount of public use at any given time. Although vegetative encroachment continues, there is still good resting habitat and the area's topography naturally draws peregrines in good numbers. It is suspected that, absent public use, productivity on this southernmost sector would often rival and perhaps exceed that of the Wash Flats.

The Wash Flats, in its natural state, was a huge washover area of beach to bay sand flats and was prime peregrine and shorebird habitat. Construction and maintenance of the stabilized barrier dune system have resulted in dramatic vegetative growth. During the past 20 seasons alone more than half the open area has been lost as good hunting and resting habitat for migrant peregrines and for shorebird foraging and nesting. Hope for the future lies in the CNWR's current policy of not maintaining the barrier dune north of D-Dike. This will foster a more natural progression of barrier island geomorphology and may return this sector to its natural state, but only after many years and only if the interior dikes are also allowed to erode. The remaining open area of the Wash Flats had less vegetation than the norm (particularly dwarf glasswort, Salicornia bigelovii, which apparently fell victim to prolonged fresh water inundation of the area) this year. Although one storm early in the survey flooded the Wash Flats, excess water cleared after a few days and we had good access. While conditions were good for sighting and capturing peregrines, many were observed flying through; few shorebirds were present and the area was not generally favored as a resting place for falcons. Refuge water control devices that will maintain optimal water levels for fall migrants and research teams in the Wash Flats should, when

installed, improve the situation. Nevertheless, this sector was our most productive during the 2000 survey.

On 14 October 1993 two adult female peregrines were equipped at Assateague with PTTs tracked and globally positioned by the Argos/Tiros system. Developed through our joint project of many years with the U.S. Army, the USFWS, and the Applied Physics Laboratory of Johns Hopkins University, these 27-gram PTTs were equipped with activity, temperature and battery voltage sensors, and transmitted signals at programmed intervals to orbiting satellites. The accuracy of the system in locating the PTT depends upon several factors, and may range from several hundred meters to several miles.

One of the 1993 adults wintered in a unique wetland habitat, at 14,000 feet on the west slope of the Andes in Argentina. Members of our research team reached this area in February of 1994, where they made detailed observations on the wintering behavior of the falcon and did a complete habitat analysis and avifauna survey. It was determined that an immature female peregrine also wintered in this small wetland with the adult we tracked.

Since that time we have continued to refine, miniaturize and apply these technologies to unlock the remaining mysteries of the tundra peregrine's ecology. This subspecies was removed from the list of endangered species entirely on the basis of population trends evident from breeding ground surveys in the Arctic and migration studies in temperate zone flyways. Although contaminant levels have declined, it still faces toxic threats to the food chains in its Central and South American wintering grounds. These technologies comprise an invaluable tool in identifying critical habitats and in pinpointing and mitigating global sources of contaminants affecting peregrines and the other Neotropical migrants with which their life histories are so irrevocably intertwined. Further detail on CCRT's development and use of these technologies, and on its other projects, may be found at [www.CCRT.org](http://www.CCRT.org).

Two PTTs, provided by North Star Science and Technology were fielded on adult female peregrines at Assateague during the 2000 survey (fig.1). A falcon outfitted 13 October with a 26-gram PTT (#25684) was still on the south central coast of Cuba on 16 November. A falcon outfitted 14 October with a 16-gram PTT (#25683) chose an uncommon

route along the Gulf Coast, and was still near South Padre Island, TX on 16 November.

In 1980 captive-bred peregrines of mixed subspecies were first released from a hack tower constructed on the Wash Flats. In 1981 a pair took up residence, produced young, and stayed on territory during the fall migration of tundra peregrines. Since that time residents have been present during each survey and we have witnessed aggression towards migrants in varying degrees. Other individuals of the newly established eastern race have at times taken territories on the north and south ends of the island, and have been observed defending these territories. It has been clear that the artificial establishment of this coastal population has resulted in many agonistic encounters for migratory peregrines in the autumn. On two occasions we observed the 2000 Wash Flats pair in territorial encounters with migrants, and they successfully relocated the perceived interloper in each instance. As previously mentioned, a resident adult female on the McCabe Tract (which may be an overwintering tundra peregrine) was observed in three territorial encounters with other adult females.

## RECOMMENDATIONS

The tundra peregrine has made a significant recovery and has been removed from the list of endangered species, yet continued monitoring of populations is imperative. Because of this survey's long-term continuity and standard method for data collection it has become an essential tool in that effort. During the past 31 autumn migrations we have logged more than 15,000 hours in the field, observing over 14,000 peregrines and capturing almost 4,000 individuals. It is important that this database be perpetuated without changes in protocol that will unnecessarily compromise its value. As outlined above, our work with satellite telemetry will allow for continued research to elucidate the hitherto undescribed aspects of the tundra peregrine's wintering biology and continental migration. Given available technologies, Assateague remains the ideal laboratory in which to study and address certain present and future issues of concern to peregrines and other Neotropical migrants. In addition, the new race of eastern peregrines introduced from captive stocks is encountered routinely on the island. Our continued observations on this race and its interactions with migrating tundra peregrines should be an invaluable asset when future management decisions are considered.

Accordingly, this research effort is projected to continue into the foreseeable future.

#### ACKNOWLEDGMENTS

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# ASSATEAGUE AUTUMN PEREGRINE SURVEY 2000 TOTALS

TABLE 1.

## ASSATEAGUE AUTUMN PEREGRINE SURVEY 2000 TOTALS

|                 | Observed | Captured | Recaptured | resighted |
|-----------------|----------|----------|------------|-----------|
| Immature male   | 140      | 42       | 2          | 35        |
| Immature female | 199      | 70       | 5          | 42        |
| Adult male      | 11       | 3        | -          | -         |
| Adult female    | 78       | 40       | 2          | 3         |
| Unidentified    | 94       | -        | -          | -         |
| Total           | 522      | 155      | 9          | 80        |

TABLE 4.

ASSATEAGUE AUTUMN PEREGRINE SURVEY  
2000 PRODUCTIVITY BY SECTOR

|                   | Sighted | Sighted/10<br>man-hours | Captured | Captured/10<br>man-hours |
|-------------------|---------|-------------------------|----------|--------------------------|
| McCabe Tract (MD) | 116     | 9.43                    | 46       | 3.73                     |
| State Park (MD)   | 1       | 4.29                    | -        | -                        |
| Access Road (MD)  | 1       | 0.84                    | -        | -                        |
| Maryland Beach    | 31      | 5.04                    | 10       | 1.62                     |
| Refuge Beach (VA) | 96      | 8.23                    | 29       | 2.48                     |
| Wash Flats (VA)   | 145     | 17.19                   | 40       | 4.74                     |
| Service Road (VA) | 17      | 3.17                    | -        | -                        |
| Hook (VA)         | 115     | 13.80                   | 30       | 3.60                     |

FIGURE 1.

Location Estimates of Two Adult Female Peregrine Falcons  
Tagged On Assateague Island MD/VA  
October 2000



Autumn 2000 Peregrines

- 25683
- ⊙ 25684

400 0 400 800 Miles