

Peregrine Falcon populations – status and perspectives in the 21st century

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## Peregrine Falcon recovery in the continental United States, 1974-1999, with notes on related programs of The Peregrine Fund

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## **Abstract**

In the early 1900's the estimated population of the eastern American Peregrine Falcon Falco peregrinus anatum, was thought to be in the neighborhood of 400 pairs. Surveys indicated that by 1965 not a single pair was known to be nesting east of the Mississippi River. In 1975 in the western United States the known number of nesting Peregrines had declined to less than 40 of the 300 + pairs known for the region historically. In 1969 the Peregrine Falcon was placed on the U.S. Endangered Species List, and in 1972 the use of the pesticide DDT, the main cause for the population decline, was banned. Captive breeding efforts were initiated by falconers and The Peregrine Fund was established by Dr. Tom Cade in 1970 with the purpose of breeding Peregrines in captivity for release into the wild. Soon major release efforts were under way throughout the country. Between the years of 1974 to 1999 over 5102 Peregrines were released in the continental United States. The most successful release methods included fostering, and most commonly hacking from cliffs, towers, and in cities. As a result of the banning of DDT, and releases accompanied by natural repopulation, by 1999 the known nesting population in the continental United States exceeded over 1650 pairs. On 20 August 1999 the Peregrine was officially removed from the United States Endangered Species list. The successful recovery of the Peregrine led to the establishment of the World Center for Birds of Prey and the Archives of Falconry in Boise, Idaho, USA, and provided the impetus and methodology for many similar programs for other raptors species around the world.

**Key words:** Peregrine Falcon, *Falco peregrinus anatum*, falconry, breeding, reintroduction

This paper discusses the role that The Peregrine Fund and other organizations played in the recovery of the Peregrine Falcon in the United States and other parts of North America. The success of this effort can be attributed to knowledge and cooperation of falconers and other raptor enthusiasts. The successful recovery of the Peregrine led to the establishment of the World Center for Birds of Prey and the Archives of Falconry in Boise, Idaho, USA, and provided the impetus and methodology for many similar programs for other raptors species around the world.

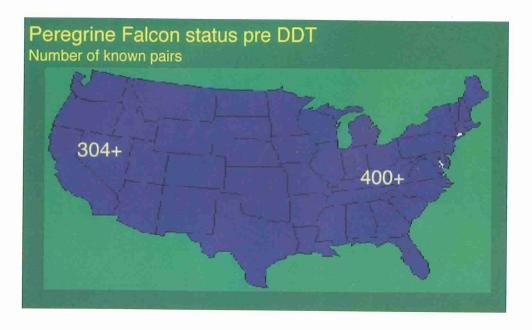


Figure 1. Peregrine Falcon Status Pre DDT.

Prior to the use of DDT the known Peregrine population on the east coast was over 400 pairs.

In the west over 300 pairs were known. This number was undoubtedly much higher as most of the region was very remote and not surveyed.

The American Peregrine Falcon *Falco peregrinus anatum* was never a particularly common species in North America historically. In the early 1940's, the breeding population of the eastern United States was estimated to be about 350 pairs (Hickey 1942) and that of the western United States at around 310 pairs (Bond 1946). Only 20 years later, it was obvious to Peregrine enthusiasts that a precipitous population decline had occurred, and a survey of 109 known nesting sites east of the Mississippi River in the early 1960's failed to reveal a single breeding pair (Berger et al. 1969). These findings led

to an historic conference held at the University of Wisconsin in 1965 on the status of the Peregrine in North America and other parts of the world, which revealed widespread population declines (Hickey 1969). These were soon attributed to the eggshell thinning effects of DDE, the principal breakdown metabolite of the ubiquitous pesticide, DDT (Ratcliffe 1967, Hickey & Anderson 1968). In response to these findings, the use of DDT was largely banned in Canada in 1969, in the United States in June 1972, as well as in most other temperate-zone countries at that time.

Nevertheless, Peregrine populations remained depressed for a few more years, and a continent-wide survey in 1975, now judged to be the lowest point of North American Peregrine populations, indicated that the known number of breeding pairs in the western United States was only 39 known breeding pairs (Fyfe et al. 1976). Although the actual number of pairs was undoubtedly higher, owing to the lack of surveys in many remote areas, similar alarming declines were documented in Alaska, most of Canada, and Baja California, Mexico (Cade et al. 1988, Enderson et al. 1995). Only certain insular populations off the Pacific Coast of Alaska and Canada, and probably those in the southwestern United States and adjacent mainland Mexico, appeared to be relatively unaffected (Kiff 1988).

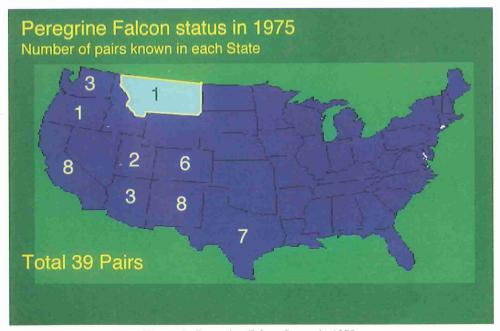


Figure 2. Peregrine Falcon Status in 1975.
By the mid 1970's the Peregrine was virtually extinct in the eastern US and only 39 pairs were known to be nesting in the western states

In 1970, Tom Cade, a well respected professor of ornithology at Cornell University and an avid falconer, devised a plan to raise Peregrines on a large enough scale to support releases to the wild, where it was anticipated that these birds would eventually breed successfully and establish new populations. This plan was made feasible by the banning of DDT. In order to accomplish his goals, Tom selected a Board of Directors made up of an avid group of hardcore, concerned falconers. The founding Board members included Bob Berry, Frank Bond, Bill Burnham, and Jim Weaver. Their approach to the Peregrine crash was that extinction of the species was not an acceptable option.

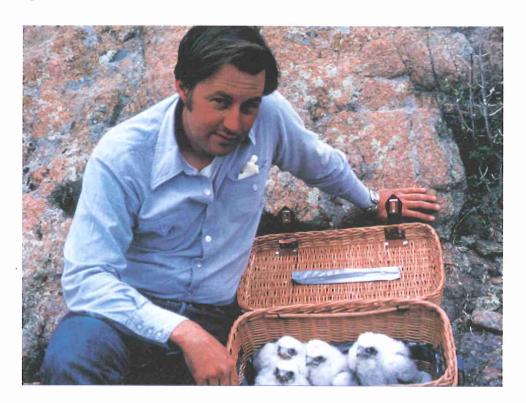


Figure 3. Peregrine Fund Board member Frank Bond.

Frank is sitting by four young captive produced Peregrines which are about to be fostered into a nest in the state of New Mexico

By the late 1970's, TPF and similar groups were beginning to raise and release Peregrines in relatively large numbers. In addition to the Cornell project, which was producing birds for release on the East Coast, a new Peregrine Fund facility was established in Fort Collins, Colorado, where Peregrines were raised and released in the Rocky Mountain states under the direction of Bill Burnham. The majority of the falcons used in those projects

were donated by falconers, although a few birds were taken from the wild. Following TPF's early successes, the Santa Cruz Predatory Bird Research Group was established in 1977 at the University of California, Santa Cruz under the direction of Brian Walton. Birds produced there from captive breeding and from the hatching of thin-shelled eggs taken from the wild were released or placed in nests of wild pairs to fledge. The Raptor Center was established at the University of Minnesota in 1974 under the direction of Pat Redig and Bud Tordoff, and they released young Peregrines obtained mainly from private breeding facilities throughout the United States and Canada in the Midwestern United States region (Tordoff & Redig 1997). In Canada, Richard Fyfe established a captive breeding and release program in Wainwright, Alberta in 1975 under the auspices of the Canadian Wildlife Service (Fyfe 1976).

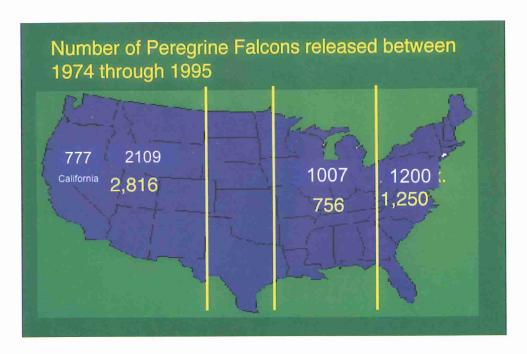


Figure 4. Number of Peregrine Falcons released between 1974 through 1995.

Between 1974 and 1999 approximately 7000 Peregrines were released in North America with

1667 released in Canada

Because the original eastern population of *E. p. anatum* had been extirpated, Cade and the collaborators in the Midwestern programs chose to breed and release Peregrines of several subspecies, including several not native to North America (Cade et al. 2000). This was a controversial policy

to some government officials and biologists, but Cade argued that having Peregrines of different subspecies was much better than having no Peregrines at all. In western North America, there was still a remnant population of anatum, so only birds of that subspecies were used in releases in the western United States, including California, and in Canada. Jim Enderson was the first falconer to breed anatum Peregrines in captivity (Cade 1988b), and he donated all of his birds to TPF's facility in Fort Collins, Colorado. His extensive experiences with Peregrines were recently recounted in the autobiographical volume "Peregrine Falcon: stories of the Blue Meanie" (Enderson 2005).

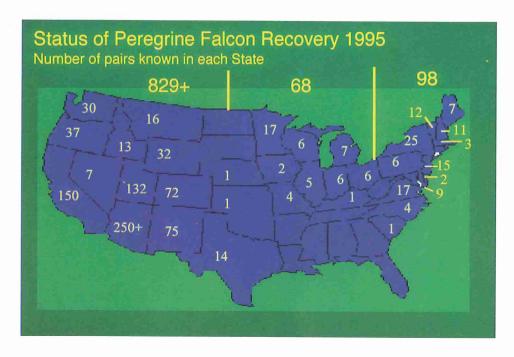


Figure 5. Status of Peregrine Falcon Recovery in 1995.
By 1999 over 1000 pairs were established though out the continental United States. All of the states individual recovery goals had been met and in many cases vastly exceeded

Breeding Peregrines had become a fine art by the late 1970's. At TPF facilities, the birds were allowed to incubate their own eggs for a week to 10 days before the eggs were removed and placed in artificial incubators. Numerous incubators were required to accommodate the hundreds of eggs that were dealt with on an annual basis. Well over 100 young were produced annually at western facility. After hatching, all of the young were raised by hand for about one week before being placed under adult Peregrines. At approximately 35 days of age, the young were taken from the adults and sent to release sites.

In the western United States, two release techniques were used. In areas with remnant Peregrine populations, eggs were removed from the eyries and replaced with three or four captive-produced young. The thin-shelled eggs laid by the wild birds were transported to the breeding facilities in portable incubators, where the eggs were hatched. The second release technique was "hacking", where four to six young were placed in a container ("hack box") at about 35 days of age and released between 40 to 45 days of age. Each release site was manned for a period of about eight weeks by two attendants, who were responsible for feeding Japanese Quail *Coturnix coturnix japonica* to the falcons on a daily basis. Over 100 000 quail were produced at TPF's breeding facilities annually to provide food for the falcons. By seven weeks, the fledged falcons typically hunted on their own, and the hack sites could be closed down at that point. Hack site locations were generally situated at locations where Peregrines were known to have nested historically.



Figure 6. Recently fostered young Peregrines in their new home

By the early 1980's, it was already apparent that the recovery of the Peregrine Falcon in North America was assured, barring a resumption of DDT use, and TPF organized an international conference on the species held

in Sacramento, California in 1985. One after another, participants rose to report good news on recovering Peregrine populations from their respective regions of the world, all of which had been preceded by bans on the use of DDT. The proceedings of the symposium were later published by TPF (Cade et al. 1988), and that volume, like the one that emerged from the 1965 Madison, Wisconsin conference (Hickey 1969), represented another major milestone in the history of the decline and subsequent recovery of the Peregrine Falcon.



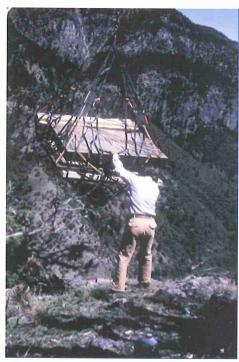


Figure 7. Peregrine Fund biologist Dan O'Brien landing a hack box above a remote cliff site.

In most cases helicopters were used to place hack boxes at remote locations in the Rocky

Mountains

From 1974 to 1999, almost 7000 Peregrines were released in North America, including 1667 released in Canada and the remainder in the lower United States. By 1999, there were over 1000 breeding pairs in the continental United States. Almost all of the recovery goals of individual states had been met and exceeded in most cases. The conservation community agreed that it was time to remove the Peregrine from the Federal Endangered Species List. On 20 August 1999, the U. S. Secretary of the Interior, Bruce Babbitt, and Idaho's U. S. Senator Mike Crapo flew from Washington, D. C. to TPF's World Center for Birds of Prey in Boise, Idaho to hold a press conference

announcing the official removal of the Peregrine Falcon from the Endangered Species List. Several months later, TPF held a large "delisting" celebration in Boise, Idaho, and hundreds of former recovery program cooperators and hack site attendants came from all over the United States to commemorate the event.





Figure 8. Dan O'Brien left and Bill Heinrich right constructing a platform and hack box on a cliff edge

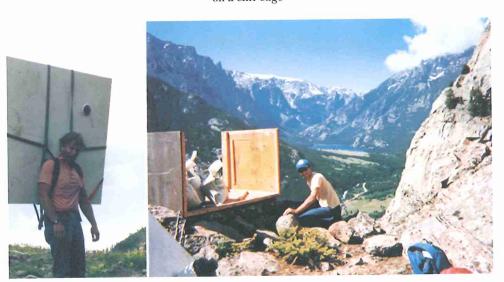


Figure 9. Jim Willmarth left, and Brian Mutch right, carrying in and setting up a hack site in the state of Wyoming

The North American Peregrine Recovery Program represents the largest and most successful program to restore and endangered species. This could not have happened with the involvement of literally thousands of dedicated falconers and biologists. In 2003, The Peregrine Fund published a book, *Return of the Peregrine* (Cade & Burnham 2003), which includes numerous accounts by many of the principals involved in Peregrine Falcon restoration in North America. The techniques developed for Peregrines have greatly influenced the restoration of other endangered species throughout the world.

## Peregrine Falcon Releases in North America Between 1974 - 99 (Total = 6769)

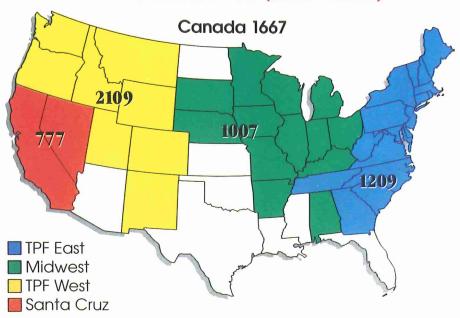


Figure 10. Five Peregrine Falcon reintroduction regions in North America 1974-1999

As a result of delisting, Peregrines can now be harvested from nest sites in several western states and used for falconry. Despite the legality of harvest, relatively few young are actually removed from the wild. This can be attributed to the fact that the nest sites are mostly difficult to locate and access. Furthermore, many Peregrines are now available from captive breeding projects. In 2006, for example, 263 Peregrines were produced by 149 licensed captive breeders in the United States, and virtually all of the young went to falconers.

Currently, The Peregrine Fund employs a multi-national staff of over 100 individuals. The Board of Directors is comprised of both scientists and business leaders, and the organization is directed by its President, Peter Jenny. TPF's World Center for Birds of Prey was established in 1984 on

a 580-acre property near Boise, Idaho. Buildings on the World Genter campus house the Archives of Falconry, a large research library, specimen collections, raptor propagation facilities, administrative offices, a raptor food production facility, and an interpretive center which is visited by more than 30 000 people annually. About 200 individual birds of prey are maintained for educational outreach, or for captive breeding programs for the Critically Endangered California Condor *Gymnogyps californianus* and the Northern Aplomado Falcon *Falco femoralis septentrionalis*. The latter program is managed by Cal Sandfort, who has directed TPF captive propagation programs since 1980. He has probably raised more Peregrines than anyone else in the world.

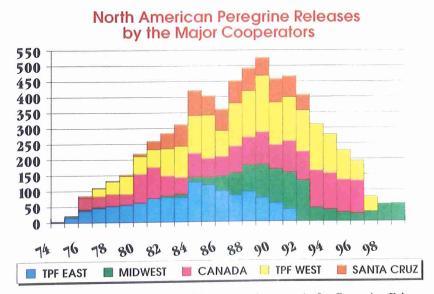


Figure 11. Number of birds released in consecutive years in five Peregrine Falcon reintroduction regions in North America 1974-1999

Given the contributions of the falconry community to the recovery of the Peregrine in North America, it seemed appropriate to locate the Archives of Falconry at the World Center for Birds of Prey. Col. Kent Carnie, an avid life-long falconer, first established the Archives in 1982. The holdings were moved to Boise in 1984, and in 2002, a new building was completed to house the Archives and The Peregrine Fund's research library. The Archives are the home for hundreds of collections of falconry items from around the world, and include thousands of hoods, traps, paintings, and other falconry objects and artwork. The Archives library includes over 1800 falconry-related titles, probably comprising the largest existing collection on this topic in the world. In 2007, an Arab Falconry Wing was added to the Archives building, and this

project was funded by the family of the late Sheikh Zayed of Abu Dhabi. This addition houses a full-sized Bedouin tent and numerous interactive kiosks with touch-screen video clips. It pays tribute to the role that the Arab people have contributed to the art of falconry.

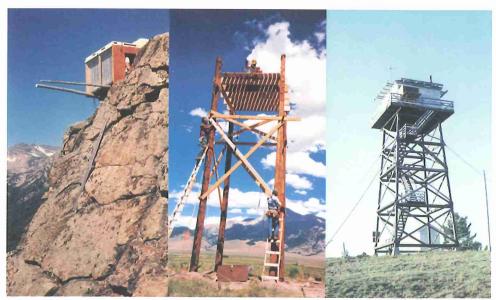


Figure 12. Three release sites used in the Rocky Mountains included cliff locations, artificial towers, and fire lookouts



Figure 13. Transmitter placement and telemetry receiver.

Early in the reintroduction effort all Peregrines wore radio transmitters which were designed to fall of within two to three weeks. Each pair of hack site attendants were taught how to use a radio receiver in order to track the Peregrines movements

The success of the Peregrine restoration effort has become a model for other endangered species around the world, e.g., the successful recovery of the Mauritius Kestrel (Jones et al. 1995) and the nearly complete recovery of the Aplomado Falcon in its former range in the southwestern United States (Jenny et al. 2004). Peregrine Fund biologists are currently studying endangered and rare raptor species around the world, and they have trained raptor biologists in far-flung countries, including Brazil, Guatemala, India, Kenya, Madagascar, Mauritius, Mexico, Mongolia, Nepal, Pakistan, Panama, Papua New Guinea, Philippines, and Zimbabwe. The present goals of The Peregrine Fund are to use birds of prey as a focus to conserve biological diversity in ecologically important areas worldwide, to use raptors as a focus to build the capacity of people and organizations to conserve natural resources and promote environmental health, and to advance the understanding of avian biology, ecology and conservation through research and education focused on birds of prey.

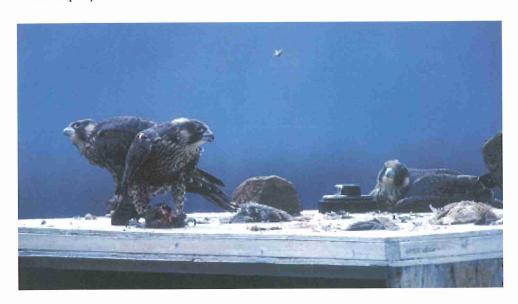


Figure 14. Young Peregrines returning to the hack box to feed. During the hacking process Peregrines were provided food at the release site for up to six weeks until they became independent

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