

The Introduction of Three Native Raptors into the Midwestern United States

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ABSTRACT

Reintroduction of Peregrine Falcons *Falco peregrinus*, Ospreys *Pandion haliaetus* and Burrowing Owls *Athene cunicularia* into appropriate areas of the upper Midwestern US were conducted from 1982 through 1990. All birds were released using hacking techniques and were banded and colour-marked. From 1982-1990, 432 captive-reared Peregrine Falcons were released from 18 hack sites in seven states. Through 1991 we had reports of 75 dead (17%), and knew of 30 territorial pairs of which 22 nested, 17 successfully, fledging 36 young. Between 1984-1990, we assisted Hennepin County Park System in the release of 87 wild-caught Osprey nestlings at six sites in East Central Minnesota. We know of two mortalities, and two males have returned to breed near their release site. From 1986 through 1990 we released 104 wild-trapped nestling Burrowing Owls at two sites in western Minnesota. Through 1991 we knew of eight mortalities (8%), and no birds were seen after the year of release.

The Peregrine and Osprey projects both seem to be successful. The lack of any known returning Burrowing Owls puts that project in doubt. However, assessment and monitoring is problematic in species where basic knowledge about dispersal and natal fidelity are poorly understood.

INTRODUCTION

Current management techniques available for endangered or threatened populations of raptors include reintroduction of individuals to parts of their former range, or the stocking of individuals to supplement declining populations. We report here on two translocations of wild young, and one programme of releasing captive-produced young. All three programmes were begun during the 1980s, and involved releasing raptors into selected areas of the upper Midwestern United States. The programmes, which involved Peregrine Falcons, Ospreys and Burrowing Owls, were run independently of each other, with separate objectives, personnel and budgets.

The Peregrine Falcon release was begun in Minnesota in 1982 and expanded into other Midwestern states beginning in 1986. Overall coordination, including chick acquisition, banding and colour-marking as well as site selection and release advice, was provided by P. Redig and H. Tordoff at the University of Minnesota. Individual hack sites were funded and managed by consortiums of public and private agencies and individuals in each state.

Osprey releases were initiated in 1984 by L. Gillette and J. Voight-Englund in the Hennepin County Park System with the assistance of the authors. The project was expanded in 1985 to

include other release sites and organizations, and in 1989 overall coordination was assumed by the authors.

Burrowing Owl releases were begun in 1985 by M. Martell, P. Redig and J. Schladweiler of the Minnesota Department of Natural Resources. The project was expanded in 1986 as part of M. Martell's thesis work at the University of Minnesota under the guidance of F. Cuthbert and H. Tordoff and with the continued assistance of J. Schladweiler, P. Redig and L. Pfanmuller.

The purpose of all three programmes was to have released individuals return and successfully breed in the release area. However, differences in the status and biology of each species required that different goals be set for each. For the Peregrine Falcon, listed as Endangered at both national and state level, a goal of 40 breeding pairs in the upper Midwest was set as the point at which the release programme could be considered a success. It was felt that this would establish a population capable of sustaining itself and allow expansion into available habitat without further releases. The Midwestern releases paralleled and complemented other releases occurring in North America. Thus, our second goal was to contribute to the larger effort of restoring this species continent-wide.

Ospreys, listed as a species of Special Concern in Minnesota, were once a common breeding bird in southern Minnesota but receded northward during the early part of the 20th century in the face of heavy human settlement (Roberts 1932). The goal of the initial release effort was to establish breeding birds in the Hennepin County Park system located on the western edge of the Minneapolis-St. Paul (Twin Cities) Minnesota metropolitan area. That goal was later expanded to 10 breeding pairs in the local metropolitan area.

Burrowing Owls are listed as Endangered in Minnesota, and Endangered or of Special Concern in neighbouring states (Martell 1991). The goal of this project was to develop release techniques which could be used to supplement the dwindling Minnesota population and be used elsewhere where the species was in trouble (Martell 1990).

METHODS

Release Sites

Peregrine Falcon releases were conducted throughout the upper Midwestern states of Minnesota, Wisconsin, Iowa, Illinois, Missouri, Nebraska, Indiana, Ohio and Michigan. A release programme not associated with ours released birds into western Ontario, complementing our efforts. A total of 22 Peregrine Falcon release sites were used and included historically occupied, relatively secluded sites along the shores of Lake Superior and the Mississippi River as well as 15 urban sites in medium to large metropolitan areas including Chicago, Illinois; Detroit, Michigan; Milwaukee, Wisconsin and Minneapolis, Minnesota.

Ospreys were released at five sites in parks and nature preserves located around the edges of the Twin Cities metropolitan area. This densely populated area of over two million people has an extensive system of lakes and large rivers which provide suitable Osprey habitat.

Burrowing Owls were released into historically occupied areas at the edge of their range in western Minnesota. This is a rural, sparsely populated area used for row crops, hay and grazing. The primary release site was a Wildlife Management Area managed for upland game and waterfowl.

Release Techniques

All three species were released using variations of hacking techniques described by Sherrold *et al.* (1982). Peregrine Falcon releases most closely followed these techniques. Young falcons were released from hack boxes located on towers, cliffs and buildings. All released birds were obtained from captive breeding stock.

Osprey release techniques followed those described by Hammer and Hatcher (1983), a modification of the standard raptor hacking technique. All released Osprey were taken from nests located in north-central Minnesota, approximately 250km north of the Twin Cities. The chicks were taken when they were between five and seven weeks of age and placed in hack boxes located on the shoreline of a lake or large river within 24 hours of capture. The hack box was opened and the birds released two to three weeks later.

Burrowing Owls, an underground nesting bird, were released from pens located on grassland

sites. The hack site was prepared by mowing a 40 x 22m section of grassland and constructing pens (7.6m x 5.5m x 1.7m) with roof and sides made from cotton mesh netting strung along metal fence poles. Up to four artificial wooden burrows (Collins & Landry 1977; Henderson 1984) were placed inside each pen, buried 1m underground (Martell 1990). All released Burrowing Owls were wild-trapped birds, translocated from South Dakota, a movement of between 450 and 600km (depending on the trapping site) east of their natal nests.

Marking and Ringing

All of the released birds were banded with USFWS aluminium leg bands and colour marked. Peregrine Falcon chicks were colour-marked with a black alpha-numerically coded aluminium leg band. Many of these birds were also temporarily marked by lightly spray-painting their feathers. Ospreys were colour-marked with blue, gold or black anodized aluminium leg bands which were alpha-numerically coded. The chicks were also temporarily marked by lightly spray-painting their feathers. Burrowing Owls were colour-marked with a unique combination of red, yellow and green leg markers. Radio-telemetry was used during the first year of the Peregrine Falcon, and first two years of the Burrowing Owl releases, to monitor the movements and habitat use of the birds.

Artificial Nest Sites

Peregrine Falcon nest boxes have been placed on buildings, bridges, smokestacks and cliffs across the Midwest, to provide suitable nesting sites for returning birds. Twenty-seven artificial Osprey nesting platforms were erected in the Twin Cities area. Artificial burrows (Collins & Landry 1977; Henderson 1984) were placed in grasslands around the release area to attract returning Burrowing Owls.

RESULTS

Peregrine Falcon

Between 1982-1991, 542 captive-bred falcons were released from 22 hack sites in nine states (Redig & Tordoff 1992). The number of birds released each year increased from five in 1982 to 108 in 1991. Overall, 316 (58%) of the birds were released in urban areas. Urban releases became more frequent in the later years of the programme, increasing from 11% of the birds released from 1982-85 to 72% in 1990-91. An additional 36 birds were released along the shore of Lake Superior by Canadian biologists, bringing the total number of Peregrine Falcons released in the area to 578.

The first pair of falcons nested in 1986 along the Mississippi River across from their release site. No young were fledged that year nor in the following two years when nesting was attempted at that site. The first successful modern nesting in the Midwest occurred in 1987 when one young was fledged from a nest box on the Multifoods Tower in Minneapolis. Since that time, the population has grown steadily. In 1991 we knew of 30 territorial pairs in the Midwest, of which 22 nested and 17 pairs successfully fledged 36 young. Urban nesters accounted for 15 of the 22 pairs documented in 1991. Since 1987 we have documented 104 wild-produced young which have successfully fledged in the region. Thus a total of 682 young Peregrine Falcons have been put into the Midwestern population since 1982.

We have documented mortality in 95 (17.5%) of the birds we released. Seventy-four (77.9%) of them were found in their hatching year. Twenty-four (10.6%) of the falcons hacked from non-urban sites were found dead compared with 71 (22.5%) of those hacked from urban sites. Thirty-eight wild adult, nestling and young Peregrine Falcons were found dead during this same period. The leading known causes of mortality and injury to both wild and captive-produced falcons were: collisions with buildings (19% of total), collisions with vehicles (12%), disease/starvation (8%), and natural predation (8%).

Osprey

A total of 93 Osprey chicks have been released between 1984 and 1991 into the Twin Cities area. The releases began in 1984 with 6 birds from two hack sites and were expanded in 1985 with

the release of 13 chicks from four sites. The largest number of releases occurred in 1987 and 1988, when 18 birds were released from five sites each year.

The first modern Osprey nesting in this area occurred in 1986, when one of the released males and two females (both unbanded and not from our project) unsuccessfully attempted to nest. They laid six eggs in the same nest, all three birds shared incubation, but no eggs hatched. An unbanded male and female nested at this site in 1987 and again were unsuccessful, but were given a foster chick to raise. In 1988 a male released from our project was present at this site with an unbanded female during courtship but was replaced by another male during incubation. By 1988 there were three nesting pairs in the area, two of which laid eggs, one successfully. In 1989 there were four active pairs, all of which had eggs, two of which successfully fledged young. In the summer of 1991 we knew of four nesting pairs in the release area. Out of these, two males (one released in 1984, the other in 1986) were from the release project. Two other birds, a three-year-old male, and a two-year-old female, have been seen in the vicinity of the hack sites but are not yet part of nesting pairs.

We have recorded mortality in eight of the released birds (8.6%). Six died during fledging; one from a collision, three from natural predation and two from dehydration. We also received two reports of dead birds from Central America; a bird released in 1986 was shot at a fish hatchery in Costa Rica later that fall, and a bird released in 1985 was found dead in Panama in April of 1986.

Burrowing Owls

From 1986 through 1990 we released 104 fledgling Burrowing Owls; 9 in 1986, 17 in 1987, 21 in 1988, 27 in 1989 and 30 in 1990. We documented eight mortalities, all fledglings recovered in the hack site area. We have not found, nor received reports of, any owls after they left the hack site. We located eight wild nesting pairs in Minnesota during this time, with a high of five pairs in 1988.

DISCUSSION

To be successful, a reintroduction should result in the establishment of a self-sustaining population (Griffith *et al.* 1989). Using this definition, it is too early to declare any of the efforts outlined here as successful, although both the Peregrine Falcon and Osprey programmes look very promising. Released Peregrine Falcons are establishing new territories across the Midwest. The number of successful territories in urban areas, probably in response to the lure of new high-rise buildings and dependable food sources, is an unexpected yet positive development. In addition to providing safe nesting sites, added benefits are found from the positive public education opportunities and easy accessibility of birds for research and monitoring.

The released Ospreys now nesting near their former hack site are, we hope, the beginning of a long-term breeding population in the Twin Cities area. While we have not had as high a return rate as reported by L. Rymon in Pennsylvania (in Poole 1989), our results are similar to those reported by other Osprey reintroduction projects (Poole 1989).

The attraction to the area of unmarked Ospreys, most likely young adults looking for a place to breed, has doubled our nesting population. We believe these birds are setting up territories in the Twin Cities in response to the presence of our released birds. This, in addition to the tolerance of nesting pairs to each other and our observations of adults feeding young at the hack boxes, contrasts with the aggressive territorial behaviour of Peregrine Falcons. We have not been forced to abandon Osprey hack sites due the presence of new nesting pairs as we were with Peregrine Falcon release sites.

The Burrowing Owl releases have shown the least success to date. While the released birds have demonstrated foraging competence, burrow finding ability, and dispersal and migration at the end of summer (Martell 1990), none has been encountered after leaving the hack site. The number of owls released to date is relatively low and one might expect a very low band return rate in this species. Nonetheless, the absolute lack of contact with released birds is troublesome. The continued removal of owlets from neighbouring populations must be justified by the benefit of establishing satellite populations. Further studies of Burrowing Owls, which are ongoing, should try to determine natal fidelity, mortality and wintering ground location.

We estimate the cost (1990 U.S.) of the releases as \$200/Burrowing Owl, \$335/Osprey and

\$3,000/Peregrine Falcon. The higher cost for the Peregrine Falcon project is primarily due to the expense of buying captive-reared falcons from breeders (\$2,000 per bird) and transporting them from various sources across the country. Additionally, Burrowing Owls were released in groups of up to 30 birds, decreasing the number of hack sites, attendants and their associated costs.

The conclusions to be gained from these releases, while tentative, are obvious: reintroductions involving many birds to repopulate large regions, as we and others are attempting to do with the Peregrine Falcon, are proving effective. This strategy is being used with many other species, in many areas of the world (Griffith *et al.* 1989). On a smaller scale, reintroductions to establish satellite populations or expand the range of a species may also be useful. This is essentially what we are attempting to do with Ospreys and Burrowing Owls. Finally, we emphasize the importance of public education and acceptance of a raptor reintroduction. We have made concerted efforts to publicize our programmes and to involve the public, the media and local politicians. This has resulted not only in a favourable climate for the reintroduced birds but has also resulted in a new public awareness and acceptance of all raptors.

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o Burrowing Owl *Athene cunicularis*