TABLE 2. Growth constants (K) of nestling Swainson's Hawks based on the logistic equation and calculated according to Ricklefs (1967). Asymptotes (a) are given for the wild-raised nestlings. Data for captives are from Olendorff (1971).

	Weight		Tarsal length		Culmen	
Nestlings	a (gm)	K	a (mm)	K	a (mm)	K
Wild-raised						
older	625	.202	76	.149	22	.089
younger	700	.202	75	.124	20	.126
Captive-raised						
mean		.172		.164		.111
range		.161–.189		.143–.186		.108–.114
N		4		4		2

fratricide or "Cainism." Thus, its weight and measurements at day 32 were included in the analysis.

Data for weight, culmen, and tarsal length were first examined graphically and then fitted to the logistic equation according to the methods of Ricklefs (1967). This technique converts a sigmoid curve of raw data into a more-easily-compared, linear function with a constant, K, indicating growth rate. Using this method, Olendorff (1971) found that the logistic function provided a best fit to data for captive Swainson's Hawks, and my choice of the logistic was made to facilitate comparisons.

Growth constants (K) were calculated using the asymptotes in table 2. The small number of data points near asymptotic age made the choice of asymptotes somewhat arbitrary, but they were similar to Olendorff's (1971) asymptotes for four male nestlings. The values of K were determined from a least-squares regression fit to the data as transformed into values from Ricklefs' (1967) appendix and not by eye fit.

Values of K (table 2) indicate that the wild nestlings increased in weight at identical rates, but 17 percent faster than the average for Olendorff's (1971: 311) captives, and 25 percent faster than his slowest-growing bird. Graphs of raw data showed that more rapid growth by the wild nestlings before 15 days of age was particularly responsible for the larger K values. Variation among K values for Olendorff's captive nestling Swainson's Hawks showed the two nestlings in 1970 growing at 93.2 percent of the rate of two raised in 1969, but overall variation among the Swainson's Hawks was comparable to variation among the K values of Olendorff's (1971: 309–310) other captive buteos. Thus variation in growth rate for the Swainson's Hawks might have been completely unrelated to their mode of upbringing. Difference in food intake might be expected to result in variation in growth rates between wild-reared young, but Ricklefs (1968: 432) showed that, unless severe, food deficiencies may have only a minor effect on growth rate.

Average values of K for both culmen and tarsal length are lower than Olendorff's averages and the former are contradictory in regard to which nestling grew faster. However, differences in measuring techniques could account for the first fact, and the second is probably due to the small number of data points for the wild nestlings. Ricklefs (1973) mentioned that error of 30–40 percent in estimates of growth rates can obtain if data sets for each bird are small, but that such error was acceptable in his analysis.

Based on extrapolations from plots of raw data, the juvenal remiges apparently emerged when the wild nestlings were 9–11 days old, and those of the rectrices appeared at about 14–15 days.

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Department of Biology, State University of New York at Fredonia, Fredonia, New York 14063. Accepted for publication 29 January 1976.

MORTALITY OF BANDED PEREGRINE FALCONS THAT HAVE BEEN HELD IN CAPTIVITY

WILLISTON SHOR

Snyder and Snyder reported (Condor 76:215–216, 1974) that four of 33 young Cooper's Hawks (*Accipiter cooperii*) that they had familiarized with human beings in the course of their studies at the nest had been recovered in less than a year after banding. They attributed all of these recoveries to "predation by man." Three of the birds had been shot and one had been killed in a building. Only one of 202 other Cooper's Hawks that they had banded in the nest and which had then been subjected to little exposure to human beings was recovered within a year after banding (one other was recovered two years and nine months after banding). The Snyders therefore concluded that the recovery of the four birds killed by "predation by man" was

a consequence of the taming effect of their exposure to human beings while they were being handled and photographed in the nest. They further hypothesized that this type of effect could be expected with other species of raptors, including the Peregrine Falcon (*Falco peregrinus*), and drew the conclusion that birds trained for falconry and later released into the wild "can be expected to be highly vulnerable to shooting."

Original banding schedules for the years before 1964 may be used for a critical examination of their conclusions concerning Peregrine Falcons. I have examined such schedules for Peregrine Falcons banded in North America between 1924 and 1963, in the form submitted by the banders (i.e., not transcribed into computer format). Entries for a few of the banded peregrines show that they were held captive for a considerable time and then released. The recovery rate of these birds is somewhat larger than that of other peregrines banded in the same period, but the difference is not large enough to be statistically or biologically significant. I made a chi-square test incorporating the Yates correction for continuity, a correction needed because of the small number of recoveries. It shows that a difference at least as great in recovery rate as that observed has two chances in three of resulting from random fluctuations without there being any real difference in probability of band recovery between birds held in captivity and those not so held. Moreover, even if the observed difference in band recovery rate indicates a real difference in vulnerability to shooting during the period when the data were collected, it is small enough so that when adjusted downwards to reflect the much lower rate of band recovery by shooting today, it becomes so small as to be negligible.

The banding schedules available cover more than half of all the peregrines that must have been banded in the United States and Canada between 1924 and 1963. I could not find the remainder when the Bird Banding Laboratory files were searched in 1969. Schedules were filed under the permit number of the bander, but a number of schedules submitted on peregrines by banders who are known to have banded them could not be found in the old files. Furthermore, unless a bander's permit number appeared on the list of peregrine recoveries, there was usually no way to know that he had banded peregrines; consequently many banding schedules must have been missed. As a result, the sample would be strongly biased toward favoring cases in which recoveries were more likely than average if those schedules submitted by banders who banded only a few birds were included in the analysis. This is because, for every bander who banded, for example, three peregrines and got one recovery so that his banding schedules were found, two or three others who banded about as many peregrines and got no recoveries must have been missed. To handle this problem, I considered only birds banded by those banders who obtained four or more recoveries. This reduced the chance of bias from this effect to a very low level. The overall recovery rate for the 628 birds shown on schedules submitted by banders who obtained four or more recoveries was a little under 12% (74 recoveries out of 628 banded). The birds banded included both nestlings and trapped birds. This rate of recovery is much greater than could be expected today because during the 40 years before 1964 when the data were accumulated, the recovery rate from shooting was, on the average, relatively high, and shooting comprised a large fraction of the overall recovery rate (over half for peregrines). Judging from recent recovery data on Prairie Falcons (*Falco mexicanus*) as well as on peregrines, a recovery rate of less than 4% from all causes would be likely for peregrines in 1975. (Shooting would be responsible for only a small part of the rate; in Prairie Falcons from 1970 through 1972, it accounted for less than one-tenth of the recoveries.) Only 2% of peregrines banded in 1968 had been reported recovered by August 1973, and 3% of peregrines banded in 1969 had been reported recovered by August 1974; the corresponding figures for Prairie Falcons are 4% and 1% respectively.

Seventeen banded peregrines that had been held in captivity are so identified by notations on the banding schedules of those banders who obtained four or more recoveries of peregrines. These birds were released after periods of several weeks to several years in captivity. Because of the ambiguity as to whether the age recorded in the banding schedule was that at capture or at release, it is not possible to tell with certainty the age of some of the birds when they were taken; however, it appears from the records that most of them were trapped.

Of the 17 birds, three were recovered, all in the United States and all within a short time after their release. One was shot three days after release. A second was found dead the month following release, and the third was recovered (no reason given) in the same month as it was released. All were recovered less than 35 miles from the point of release. The fact that all three recoveries of peregrines held in captivity took place shortly after they were released is not inconsistent with the hypothesis that once such birds had been in the wild for six weeks or so their survival probability was favorable compared with that of birds that had never been in captivity.

As pointed out earlier, the recovery rate for the birds held in captivity (18%) does not differ significantly in a statistical sense from the rate for all peregrines banded by those banders who obtained four or more recoveries (nearly 12%). (Two recoveries would have matched that rate; three were obtained.) However, even if the difference in recovery rate between that of banded birds held in captivity and that of banded birds not so held reflected a real difference in mortality rate, it does not follow that birds released after being held in captivity would, at present, be subject to a significant mortality from shooting. Rather, it indicates that in the 1970's their mortality from shooting would be only slightly greater than that of peregrines who had always been in the wild, and its absolute level would be quite low. The recovery rate today for banded birds that have not been held in captivity is down by a factor of at least three from that experienced when data were collected (i.e., reduced from nearly 12% to less than 4%). If we assume a proportionate reduction for birds released after being held in captivity, the expected recovery rate of such birds in the 1970's would be less than one-third of 18%, or under 6%. From this belief and the fact that the fraction of recoveries by shooting today for the similar-sized Prairie Falcon is so much smaller than it was for peregrines in former years (the order of one-tenth rather than the order of one-half), I conclude that the vulnerability to shooting of peregrines held in captivity and then released in the 1970's

would be much less than the vulnerability of entirely wild peregrines as it averaged in the interval 1924 through 1963. Hence, data on band recoveries for Peregrine Falcons appear not to support the Snyders' forecast, based on observation of Cooper's Hawks, that Peregrine Falcons released after being held in captivity will have a high mortality from shooting.

318 Montford Ave., Mill Valley, CA 94941. Accepted for publication 7 July 1976.

RECENT RANGE EXTENSIONS OF THE BARRED OWL IN WESTERN NORTH AMERICA, INCLUDING THE FIRST RECORDS FOR OREGON

AVERY L. TAYLOR, JR.
AND
ERIC D. FORSMAN

Recent records from southwestern British Columbia and northwestern Montana indicate that the Barred Owl (*Strix varia*) is extending its range southwestward in these areas (Grant 1966, Campbell 1973, Shea 1974). This paper presents evidence of further range extensions, including the first two records in Oregon. Implications of range overlap with the Spotted Owl (*Strix occidentalis*) are also discussed.

Grant (1966) described the recent arrival of the Barred Owl in much of the southeastern half of British Columbia, but at that time there were no records of Barred Owls in coastal British Columbia or in Washington, Idaho or Oregon. Records of Barred Owl sightings made since Grant's work are presented in figure 1 and in chronological order below:

1) 2 October 1965: Sighting, Blueslide, Pend Oreille Co., Wash. (Rogers 1966); 2) 1966 and 1968–71: Numerous sightings, Glacier Nat. Park, Flathead Co., Mont. (Shea 1974); 3) October 1968: Bird shot, Moscow Mt., Latah Co., Ida. (Rogers 1970); 4) 15 October 1968: Bird found shot, Mica Pk., Spokane Co., Wash. (Rogers 1969); 5) 1969 and 1972: Five sightings near Fortine, Lincoln Co., Mont. (Shea 1974); 6,7,8) 1969–73: Five sightings, southwest B. C. (Stirling 1970, Campbell 1973); 9) 4 June 1970: Remains of adult collected, Manning Park, B. C. (Grass 1971); 10) 17 January 1972: Bird photographed, Summerland, B. C. (Rogers 1972); 11) 6 September 1973: Sighting along shore of Priest Lake, Bonner Co., Ida. (Rogers 1974); 12) 11 October 1973: Bird flew into window near Spokane, Spokane Co., Wash. (Rogers 1974); 13) 23 June 1974: Pair near Park Rapids, Stevens Co., Wash. (Rogers 1974); 14) December 1973: Dead bird found near Skykomish, King Co., Wash. by B. and P. Evans (Wahl, pers. comm.); 15) July 1973: Sighting near Middleport, Stevens Co., Wash. by D. Paulson (Wahl, pers. comm.); 16) 16 September 1974: Pair, Colonial Creek Campground, Whatcom Co., Wash. (Crowell and Nehls 1975a); 17) 24 April–2 October 1974: Pair noted often near Bacus Hill, Skagit Co., Wash. (Reichard 1974); 15 May 1975: Reichard found nest with three young (Wahl, pers. comm.); 18) June 1975: J. Fackler found nest with one young, Ross Lake, Whatcom Co., Wash. (Wahl, pers. comm.); 19) 7 July 1975: Adult with two imm., Cortes Island, B. C. (Crowell and Nehls 1975b); 20) 13–15 August 1975: Two heard, Twin Lakes, Kootenai Co., Ida. (Rogers 1976); 21,22) First Oregon sightings; description follows.

On 18 June 1974, in the Wenaha River drainage of the Blue Mountains 7.2 km south of the Oregon-Washington border and 26.7 km west of Troy, Wallowa Co., Oregon (pt. 21, fig. 1) Karl Hulbert and the senior author observed a pair of adult Barred Owls. The owls were first seen at 16:30, roosting together in a mixed conifer stand of Grand Fir (*Abies grandis*), Engelmann Spruce (*Picea engelmanni*), Western Larch (*Larix occidentalis*) and Douglas Fir (*Pseudotsuga menziesii*) at 1280 m elevation on a bench 365 m above the Wenaha River. Within the forested area are several ponds bordered by Black Cottonwood (*Populus trichocarpa*) and Quaking Aspen (*Populus tremuloides*), and swamps with dense thickets of shrubby Alder Buckthorn (*Rhamnus alnifolia*) about 1 m high. The owls were observed for about 15 min with 10× binoculars at a distance of 10 m. The dark eyes, rounded head and streaked rather than barred lower breast were evident. When Taylor returned to the area the next day, he found one of the birds present, and photographed it from a distance of 20 m. On 22 July 1974, about 200 m northwest of the previous sightings, Taylor again saw a single adult bird, which was being harassed by a Pileated Woodpecker (*Dryocopus pileatus*). He found the owls again on trips into the area on 12 and 13 June 1975 and, 15 and 29 May 1976.

John M. Hillis, who has considerable experience with owls in Oregon, reported (pers. comm.), that during July, August and September 1974 he regularly saw and heard a pair of Barred Owls near his home 24 km southeast of Pendleton, Umatilla Co., Oregon (fig. 1, pt. 22). This sighting is about 56 km southwest of the Wenaha sightings, and 47.5 km south of the Oregon-Washington border.

These observations constitute the first records of the Barred Owl in Oregon, as well as a southwesterly range extension of about 160 km from the previously known limit near Moscow, Idaho (Rogers 1970). The fact that both Oregon records were of paired birds during the breeding season suggests that the species may breed in Oregon. Whether these records represent actual extensions of the range, or whether Barred Owls have been present but undetected in these areas is unknown. It seems unlikely, however, that the species could have gone undetected until the last decade in Washington, Idaho and Oregon.

The recent movement of Barred Owls into southwestern British Columbia and northwestern Washington has created range overlap with the Spotted Owl, which occurs at least as far inland as Manning Park (fig. 1) and as far north along the British Columbia coast as Alta Lake (Guiguet 1970). Barred Owls are slightly larger than Spotted Owls, and both species inhabit forest. Both forage primarily upon nocturnal forest rodents and small birds and nest most often in large cavities in trees (Dunstan and Sample 1972, Bent 1938, Forsman 1976). It seems doubtful that two species so similar in general food habits and habitat requirements could coexist in the same areas for long, but this relationship remains to be investigated.

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