FALL 2002 RAPTOR MIGRATION STUDIES IN THE MANZANO MOUNTAINS OF CENTRAL NEW MEXICO

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The Manzano Mountains raptor migration study in central New Mexico is an ongoing effort to monitor long-term trends in populations of raptors using the southern portion of the Rocky Mountain migratory flyway (*sensu* Hoffman et al. in press). HawkWatch International (HWI) initiated standardized counts of the autumn raptor migration through this region in 1985, and began an extensive trapping and banding program at the project site in 1990. To date, HWI observers have recorded 18 species of migratory raptors at the site, with counts typically ranging between 4,000 and 7,000 migrants per season. The 2002 season marked the 18th consecutive count and the 13th consecutive season of trapping and banding conducted at the site by HWI. This report provides a brief summary of the 2002 count and banding results. HWI will present a more in-depth review of the season's results in a comprehensive, multi-site report in summer 2003.

STUDY SITE

The project site is located in the Manzano Wilderness Area of the Cibola National Forest (Manzano Ranger District) near Capilla Peak, approximately 56 km south-southeast of Interstate 40 (34°42.25' N, 106°24.67' W). The observation post is located at an elevation of 2,805 m (9,195 ft) on a northwest-southeast facing outcrop of a limestone ridge. It is reached by walking up a 1.2 km trail from the main road leading up to Capilla Peak (FS 522). During 2002, three banding stations were distributed around the observation point within 0.25–1.5 km. **North** station, operated every year since 1990, was located 100 m east and 50 m north of the observation point at an elevation of 2,790 m. **South** station, operated part to full-time most years since 1991, was located 1.4 km south of the observation point at an elevation of 2,745 m. **West** station, operated every year since 1991, was located 0.5 km southwest of the observation point at an elevation of 2,684 m.

COUNT METHODS

Weather permitting, two official or designated observers conducted standardized daily counts of migrating raptors from a single, traditional observation site from late August through early November. Observations typically began between 0800–0900 hrs and ended near 1700 hrs Mountain Standard Time (MST). This was official observer Carrie Hisaoka's second season of counting in the Manzano Mountains and Richard Sim's first season of migration counting. Visitors also occasionally assisted with spotting migrants. Data gathering and recording followed standardized protocols used at all HWI migration sites and as outlined in prior reports for this project.

TRAPPING AND BANDING METHODS

Weather permitting, the trappers operated three traditional banding stations daily from late August through late October, generally between 0900–1700 hrs MST. Capture devices included mist nets and remotely triggered bow nets. Trappers lured migrating raptors into the capture stations from camouflaged blinds using live, non-native avian lures attached to lines manipulated from the blinds. Unless already banded, all captured birds were fitted with a uniquely numbered USGS Biological Resources Division aluminum leg band. Data gathering and recording followed standardized protocols used at all HWI migration-banding sites and as outlined in prior reports for this project. All birds were released within 45 minutes from the time of capture.

COUNT SUMMARY

The observers worked on 57 of 69 possible days between 27 August and 3 November (Table 1). The number of days and hours (518.50) of observation were 10% lower and 3% higher than average, respectively. The 2002 average of 2.3 observers per hour (including official and guest observers; value is mean of daily values, which are in turn means of hourly values) was 6% higher than average.

The observers recorded 5,040 migrating raptors of 18 species during the 2002 season, which is a statistically insignificant 3% below average (Table 1; and see Appendix B for daily count records). The count of 127 Peregrine Falcons was a record high for the site; otherwise, counts for all other species fell within previously documented ranges (see Appendix C for annual summaries).

The 2002 flight was composed of 58% accipiters, 19% buteos, 13% falcons, 5% vultures, 3% eagles, <1% each of Ospreys and harriers, and 1% unidentified raptors. The season featured significantly higher than average proportions of accipiters and Ospreys, and significantly lower than average proportions of vultures and harriers (Figure 1). As usual, Sharp-shinned Hawks were the most common migrant (30% of the unadjusted total count), followed by Cooper's Hawks (23%), Red-tailed Hawks (15%), American Kestrels (9%), and Turkey Vultures (5%; Table 1, Appendix C).

Peregrine Falcons and Ferruginous Hawks showed significantly earlier than average median passage dates in 2002; Ospreys, Northern Harriers, Northern Goshawks, American Kestrels, and Prairie Falcons showed later than average timing; and all other species showed average timing. Thus, no consistent patterns of variation in timing across species were apparent, nor did age and sex-specific data indicate any consistent patterns other than predominantly average timing. Likewise, the overall seasonal distribution of activity showed a typical pattern (Figure 2).

Only three species showed significantly below average counts and passage rates this season (Turkey Vulture, Northern Harrier, and American Kestrel; Table 1). Turkey Vultures and Northern Harriers, in particular, have shown a steep downward slide during the last four years, after showing strong increasing patterns through the 1990s (Figure 3). In contrast, six species showed significantly above average totals in 2002 (Cooper's Hawks, Northern Goshawks, Broad-winged Hawks, Red-tailed Hawks, Golden Eagles, Peregrine Falcons), which generally continues long-term increasing patterns for these species (e.g., see Figure 4). In particular, the record-high count of 127 Peregrine Falcons comprises only the second time in the history of the project that the peregrine count has exceeded 100 birds!

The majority of western migration data from the past five years has shown distinct downturns that we believe reflect the negative impact of the prolonged drought that has plagued much of the interior West since 1998. The Manzano trends also suggest drought effects for several species. Turkey Vultures, Ospreys, Northern Harriers, and Merlins have shown pronounced declines since the mid-1990s after generally showing previous increases (Figure 3). American Kestrels, Prairie Falcons, and Sharp-shinned, Cooper's and Red-tailed Hawks also most likely have experienced declines in the Manzanos in the last few years; however, each of these species showed a slight upward swing in 2002 and Cooper's Hawks, Red-tailed Hawks, and Prairie Falcons are still showing significant long-term increasing trends (Figure 4). Moreover, most species for which we obtained age-specific data continued to show depressed immature : adult ratios in the Manzanos in 2002, which suggests continued poor recruitment.

Across HWI's network of western migration-monitoring projects, the 2002 season featured stark contrasts within each of the three major western flyways (Pacific Coast, Intermountain, and Rocky Mountain; Hoffman et al. 2002). Within the Rocky Mountain Flyway, the average overall Manzano count contrasted with a record-low count in the Bridger Mountains, Montana. Within the adjacent Intermountain Flyway, a record-low overall count in the Goshute Mountains, Nevada contrasted with a near average count in the Grand Canyon. Thus, within these two flyways, a possible common pattern of low counts to the north but average counts to the south emerged; however, an explanation for this pattern is difficult to ascertain given that the drought has generally been more severe farther south.

On the positive side, Ferruginous Hawks have shown a strong long-term decreasing pattern in the Manzanos; however, counts of this species have increased during the past two season (Figure 4).

TRAPPING AND BANDING SUMMARY

Trapping occurred on 51 of 53 days between 3 September and 25 October, with effort totaling 956.92 station hours (see Appendix D for daily trapping records). The is an average number of trapping days and 3% higher than the average hours of effort for the site (see Appendix E for annual trapping summaries).

The trappers captured 1,295 raptors of 12 species during the season (Table 2). The capture total was a significant 23% above average and the third highest ever recorded at the site (Appendix E). The totals included a Broad-winged Hawk and a remarkable three Swainson's Hawks; we had captured only one individual of each of these species previously! Both the overall capture rate of 135 birds per 100 station hours and the overall capture success of 28% of the observed, trappable raptors also were significantly above average (Table 2). The record-high count of Peregrine Falcons also translated to a record-high capture total of 13 birds. In fact, the capture totals were above average for all but three species (Red-tailed Hawk, American Kestrel, and the rare Zone-tailed Hawk), and were average or only slightly below average for those three.

Both capture rates and successes were significantly above average for seven species and no species showed significantly below-average values (Table 2). The consistently above-average capture statistics for Cooper's Hawks, Northern Goshawks, Broad-winged Hawks, Golden Eagles, and especially Peregrine Falcons undoubtedly reflect in part above-average flight volume for these species. However, for several other species, above-average capture statistics cannot be attributed to high flight volume. In fact, high capture rates and success despite average to below-average flight volume was a common theme across HWI's network of western migration-banding projects in 2002. Once again, this suggests that many of the 2002 migrants were hungrier than usual due to the drought.

ENCOUNTERS WITH PREVIOUSLY BANDED BIRDS

The 2002 capture totals included 7 recaptures of previously banded birds: 3 Cooper's Hawks originally banded in the Manzanos (2 in 1997, 1 in 1999), 3 Cooper's Hawks originally banded at HWI's nearby spring migration project in the Sandia Mountains (2 in 1993, 1 in 1998), and a hatch-year Northern Goshawk originally banded at an as yet unknown location. This raises the total number of Manzano–Sandia exchanges to 39, and the total number of Manzano recaptures to 23.

During 2002, we received reports of six foreign encounters with Manzano-banded birds. These included one immature Red-tailed Hawk banded in 2001 and found dead three months later near the San Pedro River in the southeastern corner of Arizona (491 km S). Two female Sharp-shinned Hawks banded in 2001 (1 hatch-year, 1 second-year) were recovered the following spring in central Colorado (434 and 460 km N), one dead of unknown causes and one found injured and taken to a rehabilitation facility. Three Cooper's Hawks banded between 1998 and 2000 (adult male in 1998, hatch-year female in 1999, second-year female in 2000) were recovered between February and September 2002. An adult male banded in 1998 was found dead in northwestern Colorado (430 km N) in September 2002. A hatch-year female banded in 1999 was found dead in central Colorado (468 km N) after it struck a stationary object in August 2002. A second-year female banded in 2000 was found dead in Durango, Mexico (980 km S) in February 2002. These bring the total number of foreign encounters with Manzano-banded birds to 56, excluding recaptures in the Sandias.

During the 2002 season, our trapping efforts enabled three other complimentary studies. First, we succeeded in deploying satellite transmitters on 2 Northern Goshawks, 4 Red-tailed Hawks, and 4 Golden Eagles. Initial tracking summaries and maps with information compiled through late November 2002 are now posted on our web site at www.hawkwatch.org. Second, colleague Ruth Smith continued to collect feather and blood samples from Sharp-shinned Hawks for her study of relationships between blood-borne parasites and migration ecology. Third, we collected feather samples from Northern Goshawks and Red-

tailed Hawks to contribute to two Boise State University graduate studies designed to use analysis of stable-isotope ratios to identify migrant source populations.

SATELLITE TELEMETRY

We succeeded in deploying satellite transmitters on 2 Northern Goshawks, 4 Red-tailed Hawks, and 4 Golden Eagles during the 2002 season. This fulfilled our objectives except for falling well short of our target of six goshawks. Although our count of goshawks in the Manzanos was well above average, goshawks of sufficient size and condition for telemetry proved to be scarce.

At the time of this writing, all four of the 2002 Manzano red-tails were still alive and wintering in Mexico. Their wintering locations include Zacatecas, Durango, Mexico state, and Chihuahua.

All four of the Manzano eagles also were still alive and well as of mid-February 2003. Their wintering locations include the Sacramento and Guadalupe mountains region along the southern New Mexico–Texas border, the Pecos River Valley of southeastern New Mexico, a broad area in southeastern New Mexico, and the western panhandle of Texas east of the Sierra Vieja. The wintering locations of our first two Manzano eagles covered a similar range of geography from western New Mexico to western Texas (temporarily in northern Mexico).

As has been the case throughout our study and again in 2002, mortality among the young goshawks we have outfitted has been consistently rapid and nearly 100% for all four sites where we have outfitted birds. One of the two 2002 Manzano goshawks, a second-year bird, initially moved a short ways east and then 10 km south of the banding site, remaining in the Manzano Mountains. Unfortunately, after only five days the transmissions ceased, which precludes further investigation into the cause of failure. The second bird survived for about six weeks. It initially spent six days traveling 115 km north into the Jemez Mountains, but then most likely died about 15 km south of the project site in the southern Manzano Mountains. We are currently working on recovering this bird but the terrain is proving to be a difficult challenge.

Complete tracking summaries and maps for all of HWI's telemetry birds can be found on our web site at www.hawkwatch.org. A comprehensive 2003 telemetry progress report also can be accessed in the publications section of the web site.

IDENTIFYING MIGRANT ORIGINS THROUGH STABLE ISOTOPE ANALYSES

For the first time in 2002, HWI contributed feather samples from Red-tailed Hawks and Northern Goshawks captured at Manzanos to two Boise State University graduate student studies designed to use analyses of stable-isotope ratios to identify migrant origins. This cutting-edge technique uses known geographic patterns of variation in the distribution of heavy and light isotopes of primarily hydrogen to determine the approximate latitudinal origins of migrants (Meehan et al. 2001, Smith et al. in press). Variation in precipitation patterns contributes to distinct patterns of variation in the ratios of heavy and light hydrogen isotopes across the landscape, and these isotope signatures are incorporated in the growing feathers of young birds. Thus, feathers can be collected from juvenile migrants, the isotope ratios in the feathers determined, and then each bird's signature can be compared against the known distribution of isotope-ratios across the landscape to identify the approximate latitudinal origins of each migrant.

The resolution of the analyses is rather coarse scale, but for broad-ranging species allows researchers to determine whether migrants derive primarily from, for example, northern, central or southern segments of the species' range. This technique has already yielded valuable insight concerning the origins and migration ecology (relative passage timing of different subpopulations) of migrants sampled at HWI migration project sites in Florida (Meehan et al. 2001, Lott et al. in press) and in the Manzanos (Smith et

al. in press, DeLong 2003). Moreover, compared to complimentary satellite-telemetry studies, the stable-isotope technique can be applied to any size bird. In 2002, HWI collected feathers for the red-tail and goshawk studies at all of its banding project sites in the West, and we anxiously await the results of the pending analyses.

If appropriate funding can be secured, HWI hopes to significantly expand its involvement in stable-isotope research beginning in fall 2003.

VISITATION

More than 450 individuals visited the Manzanos project site in 2002, with visitors originating in 12 states. Aside from individuals and families, educational groups visited from three New Mexico schools, the Rio Grande Nature Center, and a teacher-training program sponsored by the New Mexico Game and Fish. On-site educator Melissa Witte reports "a wonderful learning experience" for herself and believed everyone experienced a "truly memorable season."

ACKNOWLEDGMENTS

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Table 1. Annual raptor migration counts and adjusted (truncated to standardized annual sampling periods and adjusted for incompletely identified birds) annual passage rates by species in the Manzano Mountains, NM: 1985–2001 versus 2002.

	COUNTS			RAPTORS / 100 HRS[1]		
SPECIES	1985–2001[2]	2002	% CHANGE	1985–2001[2]	2002	% CHANGE
Turkey Vulture	405 ± 128.1	239	-41	124.2 ± 36.78	71.3	-43
Osprey	27 ± 6.2	32	+21	7.8 ± 1.62	9.3	20
Northern Harrier	63 ± 12.7	33	-47	12.9 ± 2.30	6.8	-47
Sharp-shinned Hawk	1461 ± 226.5	1524	+4	362.2 ± 52.04	382.8	+6
Cooper's Hawk	958 ± 163.0	1149	+20	273.8 ± 36.42	323.4	+18
Northern Goshawk	16 ± 4.7	23	+45	3.6 ± 1.27	5.0	+41
Unknown small accipiter[3]	86	188	–			
Unknown large accipiter[3]	0	3	–			
Unidentified accipiter	104 ± 28.2	11	–			
TOTAL ACCIPITERS	2543 ± 367.8	2898	+14			
Broad-winged Hawk	6 ± 1.7	9	+58	1.7 ± 0.47	2.8	+61
Swainson's Hawk	652 ± 827.3	139	-79	240.4 ± 305.61	51.0	-79
Red-tailed Hawk	625 ± 86.2	778	+24	137.9 ± 16.54	170.8	+24
Ferruginous Hawk	14 ± 2.6	14	+3	2.9 ± 0.59	2.9	+1
Rough-legged Hawk	0 ± 0.2	0	-100	0.1 ± 0.05	0.0	-100
Zone-tailed Hawk	1 ± 0.4	1	+55			
Unidentified buteo	20 ± 11.4	32	+60			
TOTAL BUTEOS	1317 ± 836.1	972	-26			
Golden Eagle	119 ± 15.1	149	+25	25.8 ± 3.49	31.5	+22
Bald Eagle	3 ± 1.2	3	-12	1.0 ± 0.34	0.8	-17
Unidentified Eagle	1 ± 0.6	0	-100			
TOTAL EAGLES	123 ± 15.0	152	+23			
American Kestrel	575 ± 73.4	470	-18	160.5 ± 20.50	129.1	-20
Merlin	24 ± 7.1	22	-9	6.0 ± 1.67	5.9	-2
Prairie Falcon	21 ± 6.0	24	+14	4.5 ± 1.20	6.1	+33
Peregrine Falcon	38 ± 14.1	127	+237	8.9 ± 3.05	30.6	+242
Unknown small falcon[3]	0	4	–			
Unknown large falcon[3]	0	15	–			
Unidentified falcon	2 ± 1.4	2	–			
TOTAL FALCONS	660 ± 85.5	664	+1			
Unidentified raptor	50 ± 21.6	49	-1			
GRAND TOTAL	5188 ± 1088.7	5040	-3			

[1] Based on data truncated to standardized, species-specific sampling periods and adjusted for incompletely identified birds.

[2] Mean ± 95% CI.

[3] Designations used for the first time in 2001.

Table 2. Capture totals, rates, and successes for migrating raptors in the Manzano Mountains, NM: 1991–2001 versus 2002.

	Capture Total		Capture Rate[1]		Capture Success (%)[2]	
Species	1991–2001[3]	2002	1991–2001[3]	2002	1991–2001[3]	2002
Northern Harrier	5 ± 2.5	6	0.5 ± 0.21	0.6	7 ± 3.5	18
Sharp-shinned Hawk	536 ± 121.1	635	54.5 ± 7.21	66.4	32 ± 2.9	39
Cooper's Hawk	383 ± 86.0	510	39.3 ± 5.11	53.3	33 ± 3.7	41
Northern Goshawk	6 ± 2.4	10	0.7 ± 0.32	1.0	35 ± 13.2	43
Broad-winged Hawk	0.1 ± 0.18	1	0.01 ± 0.013	0.1	1 ± 1.3	11
Swainson's Hawk	0.1 ± 0.18	3	0.01 ± 0.017	0.3	0 ± 0.0	2
Red-tailed Hawk	59 ± 14.6	56	6.1 ± 1.41	5.9	8 ± 1.7	7
Zone-tailed Hawk	0.1 ± 0.18	0	0.01 ± 0.013	0.0	7 ± 14.0	0
Golden Eagle	4 ± 0.6	7	0.4 ± 0.05	0.7	3 ± 0.5	5
American Kestrel	44 ± 14.8	37	4.5 ± 1.37	3.9	7 ± 1.8	8
Merlin	4 ± 2.1	12	0.4 ± 0.21	1.3	12 ± 5.3	55
Prairie Falcon	5 ± 2.0	5	0.5 ± 0.17	0.5	16 ± 4.0	19
Peregrine Falcon	5 ± 2.3	13	0.5 ± 0.23	1.4	8 ± 2.6	9
All Species	1050 ± 230.0	1295	107.4 ± 13.45	135.3	23 ± 2.4	28

[1] Captures / 100 station hours.

[2] Number of birds captured / number of birds observed. The combined-species value was calculated excluding Ospreys, Turkey Vultures, Swainson's Hawks, Rough-legged Hawks, Ferruginous Hawks, and unknown raptors from the count totals. Species-specific values were calculated after birds identified only to genus were allocated across possible species in proportion to the relative abundance of birds identified to those species.

[3] Mean of annual values ± 95% confidence interval.

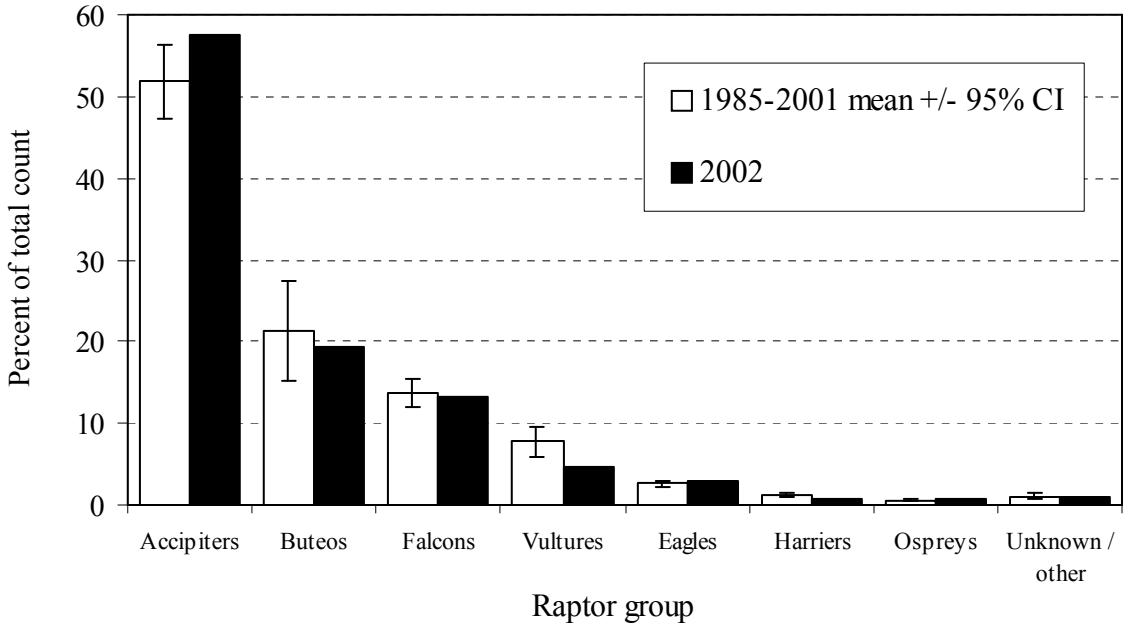

Figure 1. Fall raptor migration flight composition by major species groups in the Manzano Mountains, NM: 1985–2001 versus 2002.

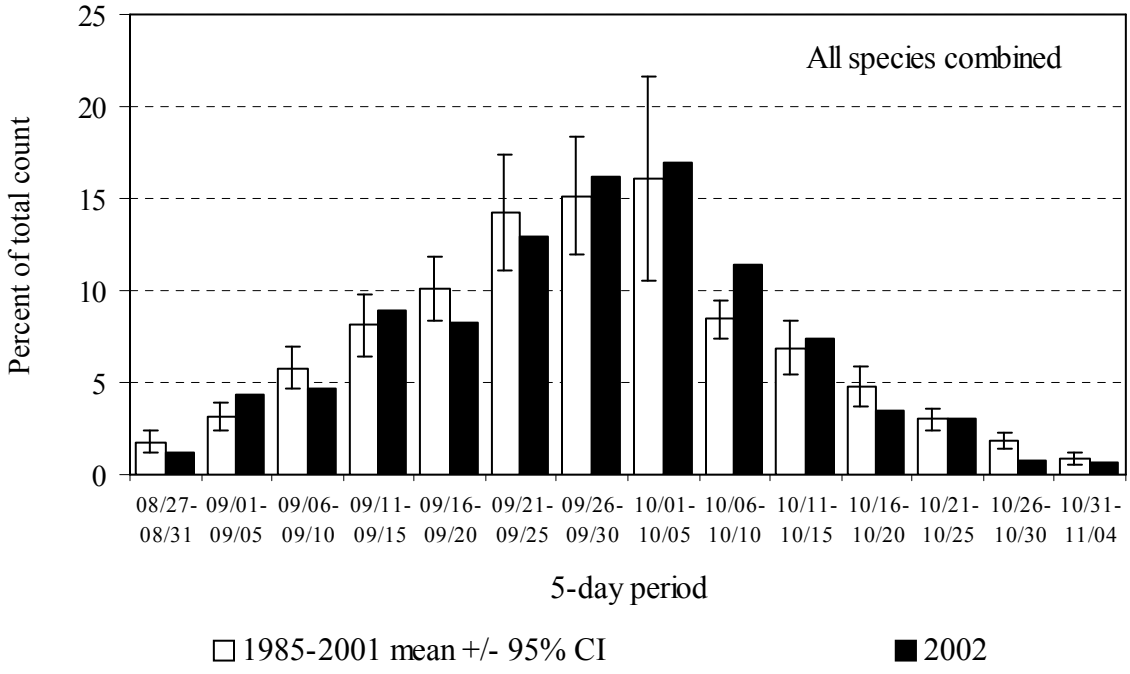

Figure 2. Combined-species passage volume by five-day periods for migrating raptors in the Manzano Mountains, NM: 1985–2001 versus 2002.

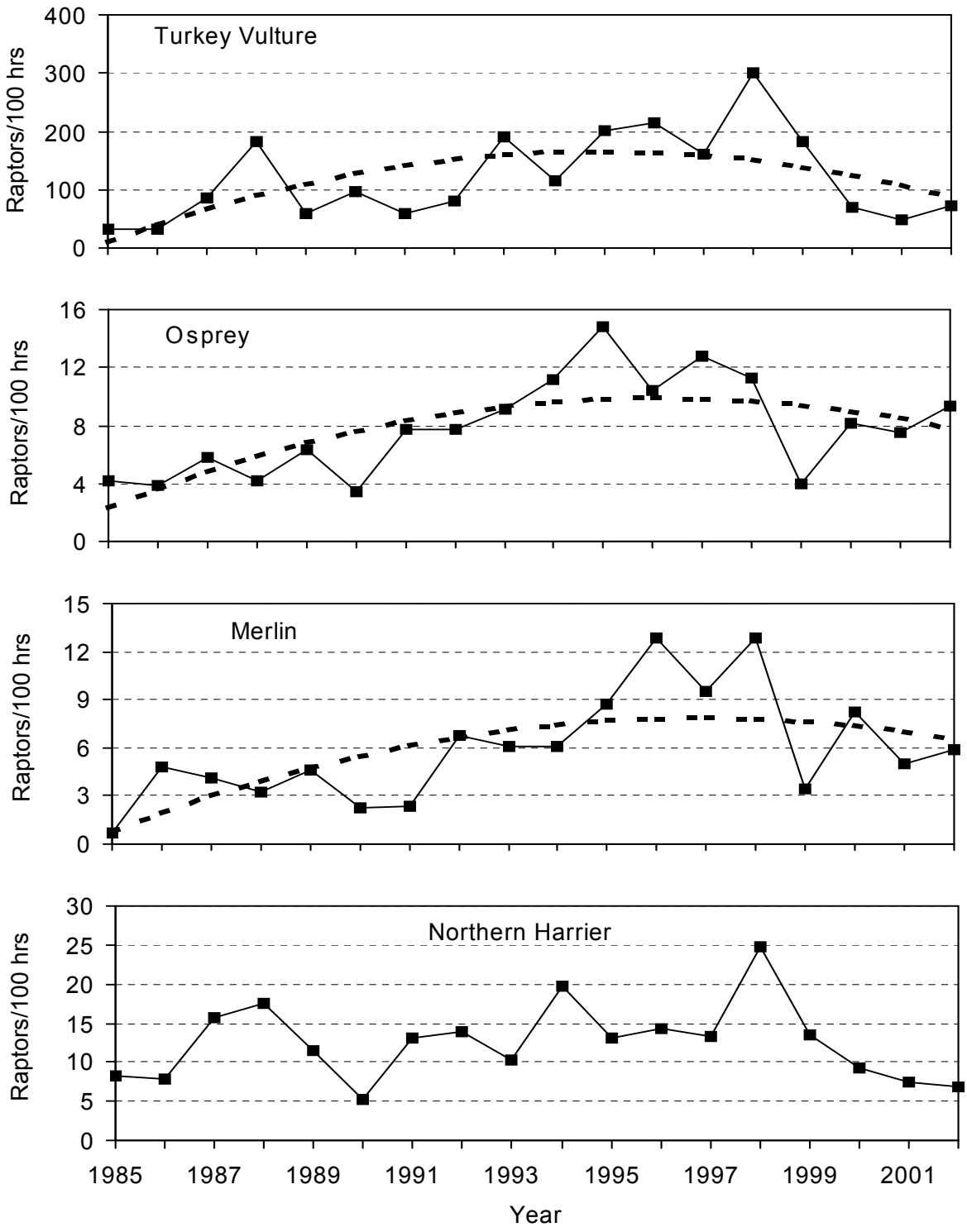

Figure 3. Fall-migration passage rates for Turkey Vultures, Ospreys, Merlins, and Northern Harriers in the Manzano Mountains, NM: 1985–2002. Dotted lines indicate significant ($P < 0.10$) regressions.

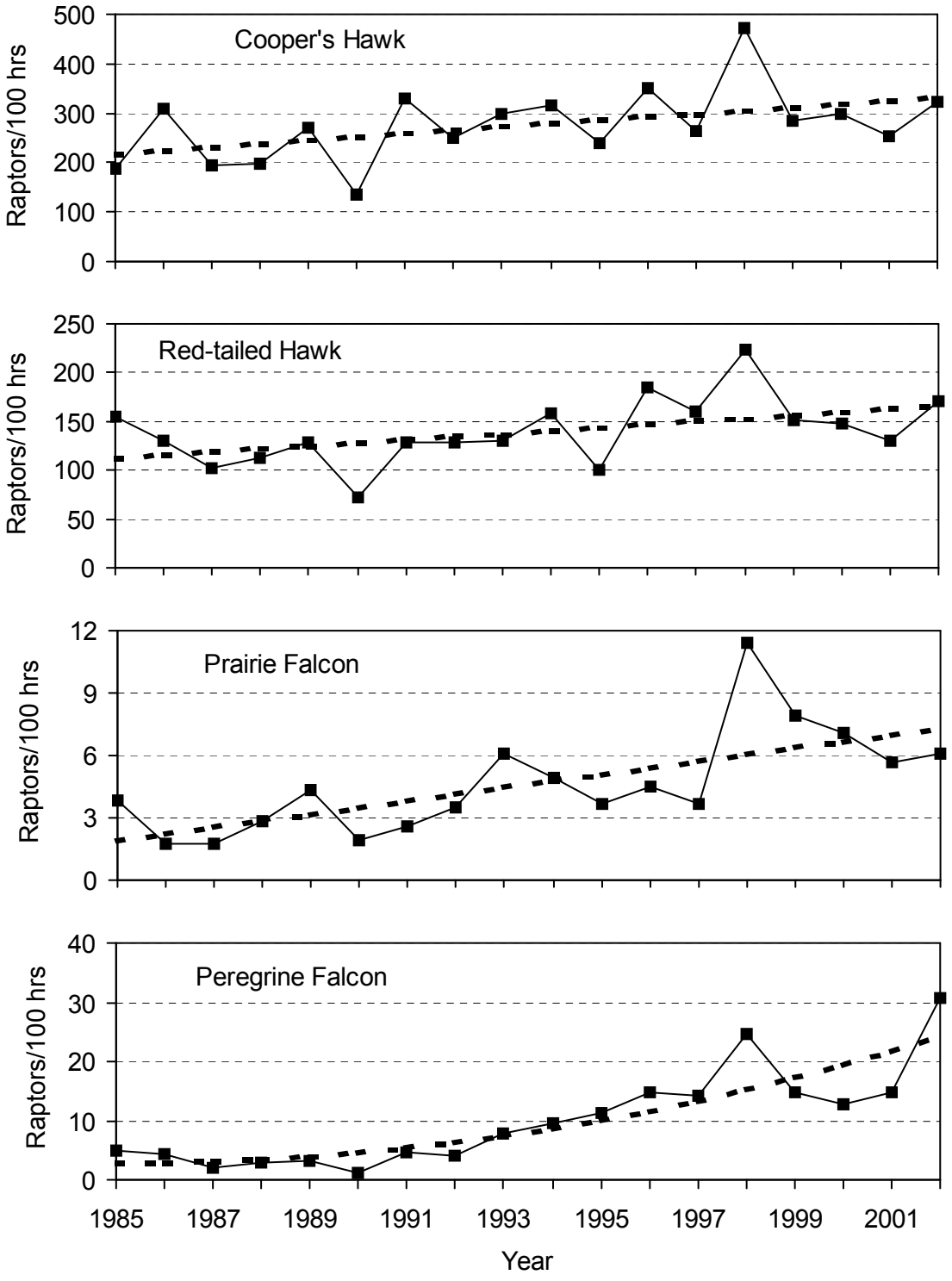

Figure 4. Fall-migration passage rates for Cooper's Hawks, Red-tailed Hawks, Prairie Falcons, and Peregrine Falcons in the Manzano Mountains, NM: 1985–2002. Dotted lines indicate significant ($P < 0.10$) regressions.

Appendix A. Common and scientific names, species codes, and regularly applied age, sex, and color-morph classifications for all diurnal raptor species observed during fall migration in the Manzano Mountains, NM.

Common Name	Scientific Name	Species Code	Age[1]	Sex[2]	Color Morph[3]
Turkey Vulture	*Cathartes aura*	TV	U	U	NA
Osprey	*Pandion haliaetus*	OS	U	U	NA
Northern Harrier	*Circus cyaneus*	NH	A I Br U	M F U	NA
Sharp-shinned Hawk	*Accipiter striatus*	SS	A I U	U	NA
Cooper's Hawk	*Accipiter cooperii*	CH	A I U	U	NA
Northern Goshawk	*Accipiter gentilis*	NG	A I U	U	NA
Unknown small accipiter	*A. striatus* or *cooperii*	SA	U	U	NA
Unknown large accipiter	*A. cooperii* or *gentilis*	LA	U	U	NA
Unknown accipiter	*Accipiter* spp.	UA	U	U	NA
Broad-winged Hawk	*Buteo platypterus*	BW	A I U	U	D L U
Swanson's Hawk	*Buteo swainsoni*	SW	U	U	D L U
Red-tailed Hawk	*Buteo jamaicensis*	RT	A I U	U	D L U
Ferruginous Hawk	*Buteo regalis*	FH	A I U	U	D L U
Rough-legged Hawk	*Buteo lagopus*	RL	U	U	D L U
Zone-tailed Hawk	*Buteo albonotus*	ZT	A I U	U	NA
Unknown buteo	*Buteo* spp.	UB	U	U	D L U
Golden Eagle	*Aquila chrysaetos*	GE	I, S, NA, A, U[4]	U	NA
Bald Eagle	*Haliaeetus leucocephalus*	BE	I, S1, S2, NA, A, U[5]	U	NA
Unknown eagle	*Aquila* or *Haliaeetus spp.*	UE	U	U	NA
American Kestrel	*Falco sparverius*	AK	U	M F U	NA
Merlin	*Falco columbarius*	ML	AM Br	AM U	NA
Prairie Falcon	*Falco mexicanus*	PR	U	U	NA
Peregrine Falcon	*Falco peregrinus*	PG	A I U	U	NA
Unknown small falcon	*F. sparverius* or *columbarius*	SF	U	U	NA
Unknown large falcon	*F. mexicanus* or *peregrinus*	LF	U	U	NA
Unknown falcon	*Falco* spp.	UF	U	U	NA
Unknown raptor	Falconiformes	UU	U	U	NA

[1] Age codes: A = adult, I = immature (HY), Br = brown (adult female or immature), U = unknown age.

[2] Sex codes: M = male, F = female, U = unknown.

[3] Color morph codes: D = dark or rufous, L = light, U – unknown, NA = not applicable.

[4] Golden Eagle age codes: I = Immature: juvenile or first-year bird, bold white wing patch visible below, bold white in tail, no molt; S = Subadult: white wing patch variable or absent, obvious white in tail and molt or tawny bar visible on upper wing; NA = Not adult: unknown age immature/subadult; A = Adult: no white in wings or tail; U = Unknown.

[5] Bald Eagle age codes: I = Immature: juvenile or first-year bird, dark breast and tawny belly; S1 = young Subadult: Basic I and II plumages, light belly, upside-down triangle on back; S2 = older Subadult: Basic III plumage, head mostly white with osprey-like dark eye line and dark band on tail; NA = Not adult: unknown age immature/subadult; A = Adult: includes near adult with dark flecks in head and dark tail tip, and adult with white head and tail; U = Unknown.

Appendix B. Daily observation effort and fall raptor migration counts by species in the Manzano Mountains, NM: 2002.

		Species[1]																											Birds
Date	Hours	TV	OS	NH	SS	CH	NG	SA	LA	UA	BW	SW	RT	FH	RL	ZT	UB	GE	BE	UE	AK	ML	PR	PG	SF	LF	UF	UU	Total	/ Hour
27-Aug	7.00	10	0	0	1	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	2.1
28-Aug	6.75	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	0	0	0	5	0.7
29-Aug	7.00	0	0	0	1	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	7	1.0
30-Aug	7.50	1	0	0	3	6	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1.5
31-Aug	6.75	9	0	0	0	4	0	0	0	0	0	4	6	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	25	3.7
1-Sep	6.75	1	1	0	0	3	0	1	0	0	0	0	3	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	13	1.9
2-Sep	7.50	0	2	0	4	13	0	7	0	0	0	0	1	0	0	0	1	0	0	0	2	0	0	1	0	0	0	0	31	4.1
3-Sep	6.25	4	0	0	5	8	0	0	0	0	0	0	3	0	0	0	0	0	0	0	4	0	0	1	0	0	0	0	25	4.0
4-Sep	9.00	14	0	0	6	9	0	2	0	0	0	6	7	0	0	0	0	0	0	0	5	0	0	2	0	0	0	11	62	6.9
5-Sep	9.00	38	0	0	5	11	0	0	0	0	0	4	10	0	0	0	0	1	0	0	12	0	0	5	0	1	0	1	88	9.8
6-Sep	9.00	5	0	0	8	17	0	2	0	0	0	4	5	2	0	0	2	0	0	0	11	0	0	9	0	1	0	0	66	7.3
7-Sep	8.25	15	0	1	19	10	0	1	0	0	0	1	8	0	0	0	0	0	0	0	10	0	0	2	0	1	0	0	68	8.2
8-Sep	9.50	0	0	0	34	9	0	4	0	0	0	0	2	0	0	0	0	1	0	0	1	0	0	2	0	1	0	1	55	5.8
9-Sep	9.00	0	0	0	32	7	0	0	0	0	1	1	1	1	0	0	0	1	0	0	1	0	0	2	0	0	0	1	48	5.3
10-Sep	0.00																													
11-Sep	0.00																													
12-Sep	4.00	1	2	0	2	1	0	0	0	0	0	16	2	0	0	0	0	2	0	0	1	1	1	1	0	0	0	0	30	7.5
13-Sep	8.50	3	0	0	27	9	0	4	0	0	0	4	6	0	0	0	1	1	0	0	8	0	0	6	0	3	0	0	72	8.5
14-Sep	9.00	5	0	0	65	19	0	6	0	0	0	0	9	0	0	0	1	0	0	0	0	0	0	6	0	2	0	0	113	12.6
15-Sep	8.75	17	3	0	59	79	0	15	0	6	1	20	14	0	0	0	2	2	0	0	9	0	1	3	0	0	0	3	234	26.7
16-Sep	9.00	3	1	0	20	26	0	2	0	0	0	1	10	0	0	0	0	0	0	0	49	0	2	2	0	0	0	0	116	12.9
17-Sep	9.00	2	1	1	28	31	0	7	0	0	0	0	11	2	0	0	0	0	0	0	30	0	4	8	0	0	1	1	127	14.1
18-Sep	1.25	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4.0
19-Sep	7.75	2	3	0	31	17	1	1	0	0	0	0	4	0	0	0	1	0	0	0	2	1	0	0	0	1	0	1	65	8.4
20-Sep	9.25	8	0	0	35	28	0	2	0	0	0	1	12	0	0	0	0	0	0	0	15	0	1	2	0	0	0	0	104	11.2
21-Sep	9.25	9	0	0	35	33	0	1	0	0	0	51	12	0	0	0	1	0	0	0	11	1	0	8	0	0	0	2	164	17.7
22-Sep	9.00	28	1	0	38	102	0	7	1	1	1	2	29	1	0	0	0	1	0	0	6	0	2	1	0	0	0	3	224	24.9
23-Sep	9.00	0	0	0	13	30	0	0	0	0	0	0	15	1	0	0	2	0	0	0	9	0	0	7	1	0	0	0	78	8.7
24-Sep	9.25	9	0	1	32	33	0	2	0	0	0	1	9	1	0	0	0	2	0	0	6	0	0	3	0	1	0	0	100	10.8
25-Sep	9.25	0	0	0	31	29	0	1	0	0	0	0	10	0	0	0	0	1	0	0	9	0	0	3	0	0	0	0	84	9.1
26-Sep	9.00	1	2	4	46	37	0	4	0	0	0	2	15	0	0	0	0	1	0	0	42	0	0	5	0	1	0	2	162	18.0
27-Sep	9.25	0	2	0	75	54	0	8	0	0	0	0	11	0	0	0	1	1	0	0	36	2	0	2	0	0	0	0	192	20.8
28-Sep	9.00	2	1	1	59	25	1	3	0	0	2	0	7	0	0	0	0	1	0	0	2	0	0	1	0	0	0	0	105	11.7
29-Sep	9.75	16	2	1	47	33	0	4	0	0	0	0	17	0	0	0	0	2	0	0	9	0	0	8	0	1	0	1	141	14.5
30-Sep	9.25	5	0	0	63	54	1	9	0	0	0	9	23	0	0	0	1	5	0	0	36	0	0	4	0	0	0	4	214	23.1
1-Oct	9.25	0	1	1	73	71	0	18	0	0	0	0	32	0	0	0	0	1	0	0	4	1	0	3	0	0	0	2	207	22.4
2-Oct	9.50	3	5	0	60	47	0	13	0	0	4	2	56	0	0	0	0	1	0	0	18	0	2	5	0	1	0	2	219	23.1
3-Oct	8.75	3	1	0	52	34	0	3	0	0	0	3	24	0	0	0	0	0	0	0	33	0	0	5	1	1	0	1	161	18.4
4-Oct	9.50	0	1	2	36	35	0	2	1	0	0	0	9	0	0	0	2	3	0	0	6	0	1	1	0	0	0	0	99	10.4
5-Oct	8.75	0	0	0	61	44	0	14	0	0	0	4	30	0	0	0	1	2	0	0	3	1	0	6	0	0	0	0	166	19.0
6-Oct	9.25	16	1	1	51	66	0	19	0	2	0	2	28	1	0	0	4	2	0	0	7	0	0	0	0	0	0	6	206	22.3

Appendix B. continued

		Species[1]																											Birds
Date	Hours	TV	OS	NH	SS	CH	NG	SA	LA	UA	BW	SW	RT	FH	RL	ZT	UB	GE	BE	UE	AK	ML	PR	PG	SF	LF	UF	UU	Total	/ Hour
7-Oct	9.25	6	0	2	31	17	1	6	1	0	0	0	24	1	0	0	4	3	0	0	11	1	0	0	0	0	0	0	108	11.7
8-Oct	9.25	0	0	1	31	14	0	1	0	0	0	1	24	1	0	0	0	2	0	0	21	1	0	1	0	0	0	1	99	10.7
9-Oct	9.50	0	0	0	25	7	0	2	0	0	0	0	24	0	0	0	0	8	0	0	12	0	0	0	0	0	0	1	79	8.3
10-Oct	9.25	0	1	2	24	11	0	0	0	0	0	0	16	0	0	0	3	13	1	0	7	1	0	2	0	0	0	0	81	8.8
11-Oct	9.25	1	0	1	34	9	0	3	0	0	0	0	17	0	0	0	0	8	0	0	7	2	1	0	0	0	0	2	85	9.2
12-Oct	8.75	0	1	0	15	7	1	4	0	0	0	0	31	1	0	0	2	1	0	0	0	0	0	1	0	0	0	1	65	7.4
13-Oct	8.25	2	0	1	23	10	2	6	0	0	0	0	29	0	0	0	0	12	0	0	1	1	0	1	0	0	0	1	89	10.8
14-Oct	9.00	0	0	3	16	1	3	1	0	1	0	0	6	0	0	0	0	8	0	0	3	0	1	2	0	0	0	0	45	5.0
15-Oct	8.75	0	0	1	44	9	0	0	0	0	0	0	17	0	0	0	1	10	0	0	2	1	0	1	0	0	0	0	86	9.8
16-Oct	9.00	0	0	1	14	3	1	0	0	0	0	0	12	0	0	0	0	8	0	0	1	1	3	1	2	0	0	0	47	5.2
17-Oct	9.00	0	0	0	10	2	1	0	0	0	0	0	6	0	0	0	0	2	0	0	0	1	1	0	0	0	1	1	25	2.8
18-Oct	4.25	0	0	0	3	0	0	0	0	0	0	0	13	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	19	4.5
19-Oct	8.25	0	0	2	10	7	3	3	0	1	0	0	11	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	39	4.7
20-Oct	9.00	0	0	1	12	3	0	0	0	0	0	0	18	0	0	0	0	8	0	0	0	2	2	0	0	0	0	0	46	5.1
21-Oct	8.75	0	0	0	20	2	2	0	0	0	0	0	18	1	0	0	0	4	2	0	0	2	1	0	0	0	0	0	52	5.9
22-Oct	8.00	0	0	1	19	0	2	0	0	0	0	0	16	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	40	5.0
23-Oct	6.25	0	0	0	8	1	3	0	0	0	0	0	5	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	21	3.4
24-Oct	3.50	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	7	2.0
25-Oct	8.00	0	0	0	14	1	0	0	0	0	0	0	12	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	31	3.9
26-Oct	0.00																													
27-Oct	4.00	0	0	0	2	0	1	0	0	0	0	0	6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	10	2.5
28-Oct	0.00																													
29-Oct	7.00	0	0	4	1	1	0	0	0	0	0	0	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	2.3
30-Oct	7.00	0	0	0	3	0	0	0	0	0	0	0	4	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	10	1.4
31-Oct	7.50	0	0	0	6	0	0	0	0	0	0	0	6	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	14	1.9
1-Nov	5.00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	0.6
2-Nov	3.25	0	0	0	1	1	0	0	0	0	0	0	4	0	0	0	0	4	0	0	0	1	0	0	0	0	0	0	11	3.4
3-Nov	6.75	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	5	0.7
4-Nov	0.00																													
5-Nov	0.00																													
Total	518.50	239	32	33	1524	1149	23	188	3	11	9	139	778	14	0	1	32	149	3	0	470	22	24	127	4	15	2	49	5040	9.7

[1] See Appendix A for explanation of species codes.

Appendix C. Annual observation effort and fall raptor migration counts by species (unadjusted data) in the Manzano Mountains, NM: 1985–2002.

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Mean
Start date	6-Sep	23-Aug	25-Aug	30-Aug	28-Aug	27-Aug	27-Aug	25-Aug	25-Aug	25-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	26-Aug
End date	2-Nov	31-Oct	4-Nov	31-Oct	31-Oct	31-Oct	5-Nov	5-Nov	5-Nov	2-Nov	8-Nov	5-Nov	5-Nov	5-Nov	5-Nov	2-Nov	4-Nov	3-Nov	2-Nov
Days of observation	50	63	65	60	63	62	67	70	68	66	70	59	68	65	70	57	68	57	63
Hours of observation	343.33	464.50	517.92	453.08	489.75	510.75	524.58	537.25	489.67	508.75	560.00	461.67	565.08	559.58	553.77	434.33	545.47	518.50	502.11
Raptors / 100 hours	843.2	863.9	758.6	772.3	955.4	494.6	825.6	946.3	2429.2	966.5	832.9	1545.9	1044.8	1594.2	873.1	991.6	855.8	972.0	1031.4
SPECIES	RAPTOR COUNTS																		
Turkey Vulture	74	118	283	466	178	295	176	268	601	430	636	640	563	1116	637	241	164	239	396
Osprey	10	14	19	13	22	12	24	26	31	38	53	33	47	44	14	25	26	32	27
Northern Harrier	28	36	78	78	59	27	66	69	48	97	72	64	69	133	69	38	37	33	61
Sharp-shinned Hawk	956	1300	1622	1118	1834	688	1080	1540	1193	1415	1519	2174	1872	2585	1212	1698	1032	1524	1465
Cooper's Hawk	531	881	679	604	929	471	1105	961	944	1054	907	1205	1018	2025	1069	984	913	1149	968
Northern Goshawk	21	20	7	6	14	3	8	16	27	30	11	9	9	19	14	42	13	23	16
Unknown small accipiter[1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86	188	137
Unknown large accipiter[1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	2
Unknown accipiter	78	104	119	111	121	120	156	117	266	118	44	147	76	107	51	29	0	11	99
TOTAL ACCIPITERS	1586	2305	2427	1839	2898	1282	2349	2634	2430	2617	2481	3535	2975	4736	2346	2753	2044	2898	2563
Broad-winged Hawk	2	2	7	10	5	2	5	5	1	7	7	4	5	14	12	3	6	9	6
Swainson's Hawk	27	33	44	3	16	9	58	344	7301	67	32	867	679	572	194	19	815	139	623
Red-tailed Hawk	513	527	457	486	604	329	577	667	566	707	519	771	803	1151	733	591	632	778	634
Ferruginous Hawk	14	15	17	20	16	13	19	25	17	13	13	4	13	10	8	3	10	14	14
Rough-legged Hawk	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0
Zone-tailed Hawk	0	0	0	0	0	0	0	2	0	1	1	0	1	2	0	3	1	1	1
Unknown buteo	21	12	11	16	4	19	30	11	31	22	9	11	3	28	5	2	106	32	21
TOTAL BUTEOS	577	589	536	536	646	372	689	1054	7916	817	581	1657	1504	1778	953	621	1571	973	1298
Golden Eagle	133	123	86	67	85	52	124	119	120	172	136	151	145	115	159	115	128	149	121
Bald Eagle	2	0	1	1	3	4	7	4	7	9	4	0	3	4	3	5	1	3	3
Unknown Eagle	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	1	0	0	1
TOTAL EAGLES	135	123	87	72	88	60	131	123	127	181	140	151	148	119	162	121	129	152	125
American Kestrel	421	755	426	385	677	409	728	704	520	582	584	905	455	742	525	397	560	470	569
Merlin	2	16	17	12	18	9	10	28	24	24	42	48	42	56	14	27	21	22	24
Prairie Falcon	13	7	8	12	19	9	14	17	27	22	18	19	19	58	38	30	28	24	21
Peregrine Falcon	14	15	7	10	15	5	21	18	31	37	49	60	67	116	64	49	63	127	43
Unknown small falcon[1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	2
Unknown large falcon[1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	15	8
Unknown falcon	4	0	1	0	3	5	3	1	0	1	0	1	0	12	2	1	5	2	2
TOTAL FALCONS	454	793	459	419	732	437	776	768	602	666	693	1033	583	984	643	504	677	664	660
Unknown raptor	31	35	40	76	56	41	120	142	140	71	8	24	15	11	11	4	20	49	50
TOTAL	2895	4013	3929	3499	4679	2526	4331	5084	11895	4917	4664	7137	5904	8921	4835	4307	4668	5040	5180

[1] New designations used for the first time in 2001.

Appendix D. Daily trapping effort and capture totals of migrating raptors by species in the Manzano Mountains, NM: 2002.

	Stn.	Species[1]														Captures
Date	Hours	NH	SS	CH	NG	BW	SW	RT	ZT	GE	AK	ML	PR	PG	Total	/ stn hr
3-Sep	3.17	0	2	1	0	0	0	0	0	0	0	0	0	0	3	0.9
4-Sep	14.50	0	1	3	0	0	0	1	0	0	1	0	0	0	6	0.4
5-Sep	13.75	0	1	5	0	0	1	0	0	2	1	0	0	0	10	0.7
6-Sep	14.75	0	3	5	0	0	0	1	0	0	1	0	0	1	11	0.7
7-Sep	15.00	0	11	6	0	0	0	0	0	0	0	0	0	0	17	1.1
8-Sep	20.83	0	14	2	0	0	0	0	0	0	0	0	0	0	16	0.8
9-Sep	23.42	0	25	3	0	0	0	0	0	0	1	0	0	0	29	1.2
10-Sep	0.00															
11-Sep	0.00															
12-Sep	6.25	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0.3
13-Sep	22.00	0	27	5	0	0	0	1	0	0	4	0	0	0	37	1.7
14-Sep	22.08	0	52	11	0	0	0	1	0	0	0	0	0	0	64	2.9
15-Sep	17.75	0	14	27	0	0	0	1	0	0	0	0	1	0	43	2.4
16-Sep	24.50	0	7	17	0	0	0	1	0	0	6	0	0	0	31	1.3
17-Sep	24.67	0	4	19	0	0	0	2	0	0	1	0	0	3	29	1.2
18-Sep	2.25	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0.4
19-Sep	18.17	0	20	4	0	0	0	1	0	0	0	1	0	0	26	1.4
20-Sep	8.50	0	19	15	0	0	0	2	0	0	3	0	0	0	39	4.6
21-Sep	24.50	0	6	15	0	0	0	1	0	0	0	1	1	1	25	1.0
22-Sep	16.75	0	21	38	0	1	0	2	0	0	0	0	2	0	64	3.8
23-Sep	19.75	0	7	15	0	0	0	0	0	0	2	0	0	1	25	1.3
24-Sep	25.08	0	19	15	0	0	0	0	0	0	2	0	0	1	37	1.5
25-Sep	24.75	0	17	24	0	0	0	2	0	0	2	0	0	1	46	1.9
26-Sep	24.08	0	22	21	0	0	0	2	0	0	2	0	0	1	48	2.0
27-Sep	25.50	0	36	32	0	0	0	0	0	0	1	0	0	0	69	2.7
28-Sep	21.25	1	33	15	0	0	0	0	0	0	0	0	0	1	50	2.4
29-Sep	17.25	0	14	20	0	0	0	2	0	0	0	0	0	0	36	2.1
30-Sep	24.17	0	17	34	1	0	0	1	0	1	2	0	0	1	57	2.4
1-Oct	25.25	1	26	29	0	0	0	5	0	0	1	1	0	0	63	2.5
2-Oct	24.82	0	21	15	0	0	0	5	0	0	0	0	0	1	42	1.7
3-Oct	17.00	0	14	13	0	0	0	0	0	0	1	0	0	0	28	1.6
4-Oct	25.17	2	8	8	0	0	0	1	0	0	0	0	0	0	19	0.8
5-Oct	24.00	0	21	27	0	0	1	3	0	0	0	0	0	0	52	2.2
6-Oct	8.25	0	12	15	0	0	1	2	0	0	0	0	0	0	30	3.6
7-Oct	25.25	0	16	10	0	0	0	0	0	0	0	0	0	1	27	1.1
8-Oct	25.50	0	10	7	0	0	0	2	0	0	4	1	0	0	24	0.9
9-Oct	25.50	0	8	6	0	0	0	2	0	0	1	0	0	0	17	0.7
10-Oct	24.75	0	5	3	0	0	0	0	0	0	1	1	0	0	10	0.4
11-Oct	25.33	0	13	4	0	0	0	1	0	0	0	1	1	0	20	0.8
12-Oct	20.00	0	7	1	1	0	0	0	0	0	0	0	0	0	9	0.5
13-Oct	10.25	0	6	4	0	0	0	4	0	0	0	0	0	0	14	1.4
14-Oct	24.75	1	10	0	1	0	0	1	0	0	0	0	0	0	13	0.5
15-Oct	20.82	0	13	5	0	0	0	2	0	2	0	1	0	0	23	1.1
16-Oct	24.75	1	5	3	1	0	0	0	0	1	0	0	0	0	11	0.4
17-Oct	16.66	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0.1
18-Oct	8.50	0	2	0	0	0	0	1	0	0	0	0	0	0	3	0.4
19-Oct	21.75	0	10	2	1	0	0	0	0	0	0	2	0	0	15	0.7
20-Oct	16.25	0	10	4	0	0	0	3	0	1	0	0	0	0	18	1.1
21-Oct	16.00	0	8	0	2	0	0	1	0	0	0	2	0	0	13	0.8
22-Oct	23.25	0	6	0	1	0	0	1	0	0	0	0	0	0	8	0.3
23-Oct	15.20	0	6	1	2	0	0	1	0	0	0	1	0	0	11	0.7
24-Oct	5.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Oct	7.50	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0.4
Total	956.92	6	635	510	10	1	3	56	0	7	37	12	5	13	1295	1.4

[1] See Appendix A for explanation of species codes.

Appendix E. Annual trapping and banding effort and capture totals of migrating raptors by species in the Manzano Mountains, NM: 1990–2002.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	MEAN	TOTAL
Start date	28-Aug	5-Sep	31-Aug	3-Sep	1-Sep	4-Sep	2-Sep	31-Aug	29-Aug	31-Aug	2-Sep	1-Sep	3-Sep	31-Aug	
End date	27-Oct	29-Oct	30-Oct	24-Oct	25-Oct	31-Oct	19-Oct	28-Oct	29-Oct	16-Oct	27-Oct	25-Oct	25-Oct	24-Oct	
Blinds in operation	1	3	3	3	3	4	4	4	3	3	3	3	3	3.1	
Trapping days	47	54	57	50	48	53	45	54	58	46	50	55	51	51.4	
Station days	47	95	131	120	121	136	132	151	165	94	119	145	131	122.1	
Station hours	511	693	967	889	926	1041	1030	1211	1352.58	663.75	791.42	1036.65	956.92	928.4	
Captures / 100 hours	47.7	72.4	108.2	100.8	110.7	85.7	137.0	95.0	148.2	115.7	121.7	85.9	135.3	105.0	1364.4
SPECIES	RAPTOR CAPTURES														
Northern Harrier	1	2	2	3	9	2	1	8	14	0	5	7	6	4.6	60
Sharp-shinned Hawk	124	262	589	430	502	493	778	612	987	321	495	426	635	511.8	6654
Cooper's Hawk	95	195	335	374	353	310	460	427	772	323	330	337	510	370.8	4821
Northern Goshawk	1	7	6	6	7	1	5	3	6	6	16	1	10	5.8	75
Broad-winged Hawk	0	0	0	0	0	0	0	0	1	0	0	0	1	0.2	2
Swainson's Hawk	0	0	0	0	0	0	0	0	0	0	0	1	3	0.3	4
Red-tailed Hawk	8	18	61	55	83	50	50	46	112	56	76	39	56	54.6	710
Zone-tailed Hawk	0	0	0	0	0	0	0	0	1	0	0	0	0	0.1	1
Golden Eagle	1	3	4	4	4	4	6	4	5	2	4	5	7	4.1	53
American Kestrel	10	13	42	14	59	28	92	32	75	44	25	56	37	40.5	527
Merlin	1	0	2	4	1	1	11	6	7	2	8	2	12	4.4	57
Prairie Falcon	1	1	3	5	3	1	3	5	13	6	3	7	5	4.3	56
Peregrine Falcon	2	1	2	1	4	2	5	7	12	8	1	10	13	5.2	68
All Species	244	502	1046	896	1025	892	1411	1150	2005	768	963	891	1295	1006.8	13088
Recaptures[1]	0	0	1	1	2	2	1	2	4	4	3	2	3	1.9	25
Foreign recaptures[2]	2	1	1	1	2	0	5	1	2	2	0	0	4	1.6	21
Foreign encounters[3]	0	2	2	3	6	6	7	8	13	12	6	8	10	6.4	83

[1] Recaptures in the Manzanos of birds originally banded in the Manzanos.

[2] Recaptures in the Manzanos of birds originally banded elsewhere.

[3] Birds originally banded in the Manzanos and subsequently encountered elsewhere.