FALL 2013 RAPTOR MIGRATION STUDIES IN THE MANZANO MOUNTAINS OF CENTRAL NEW MEXICO

HawkWatch International, Inc.

Salt Lake City, Utah

HAWKWATCH INTERNATIONAL

Conserving Raptors and Our Shared Environment

May 2014

FALL 2013 RAPTOR MIGRATION STUDIES IN THE MANZANO MOUNTAINS OF CENTRAL NEW MEXICO

Report prepared by:

Shawn E. Hawks and Dave Oleyar

Counts conducted by:

Robert Baez, Sarah Dudek, Ian Dolly, Roger Grimshaw, and Steve deLaPena

Trapping and banding conducted by:

Teresa Ely, Ben Dudek, Ian Dolly, Walt Lehman

Project coordinated by:

HawkWatch International, Inc.

Principal Investigator: Dr. Dave Oleyar

2240 South 900 East, Salt Lake City, UT 84106

(801) 484-6808

April 2014

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The Manzano Mountains Raptor Migration Project 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 (Hoffman et al. 2002, Hoffman and Smith 2003, Smith et al. 2008a). HawkWatch International (HWI) initiated standardized counts of the autumn raptor migration through this region in 1985, and began a 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 2013 season marked the 29th consecutive count and the 24th consecutive season of trapping and banding conducted at the site by HWI. This report summarizes the 2013 count and banding results.

The Manzanos project was 1 of 8 long-term, annual migration counts and 1 of 4 migration-banding studies conducted or co-sponsored by HWI in North America during 2013. The primary objective of these efforts is to track long-term population trends of diurnal raptors in western North America and around the Gulf Coast region (Hoffman and Smith 2003; Smith et al. 2001, 2008a, b). HWI partners with Hawk Mountain Sanctuary, the Hawk Migration Association of North America (HMANA), and Bird Studies Canada (BSC) to provide western US data for the Raptor Population Index (RPI), a collaborative standardized effort to monitor raptor migration across North America. Raptors serve as important biological indicators of ecosystem health (Bildstein 2001) and long-term migration counts are one of the most cost effective and efficient methods for monitoring the regional status and trends of multiple raptor species (Zalles and Bildstein 2000).

In addition to long-term counting and banding efforts, HWI conducts and supports other studies to further our knowledge about the biology of migrating raptors. Some of these efforts include: telemetry work to identify species' ranges, migratory routes and connectivity; and blood and feather sampling to track changes in raptor health and populations (e.g., Hoffman et al. 2002, Lott and Smith 2006, Goodrich and Smith 2008, DeLong and Hoffman 2004, McBride et al. 2004).

Beyond their scientific and conservation value, our migration study sites offer unique opportunities for the public to learn about raptors and the natural environment. Providing such opportunities is another important component of HWI's overall mission and the Manzano Mountains Migration Project and our outreach efforts here reach hundreds of people from New Mexico and beyond each season

STUDY SITE

The project site is located in the Manzano Wilderness Area of the Cibola National Forest (Mountainair Ranger District) near Capilla Peak, approximately 56 km south-southeast of Interstate 40 (34°42.25' N, 106°24.67' W; Fig. 1). 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). The vegetation on the slopes of the ridge consists of Gambel oak (Q*uercus gambelli*), Douglas-fir (*Pseudotsuga menziesii*), White fir (*Abies concolor*), Ponderosa pine (*Pinus ponderosa*), Pinyon pine (*Pinus edulis*), New Mexico locust (*Robinia neomexicana*), and Bigtooth maple (*Acer grandidentatum*).

During 2012, two banding stations were operated within 0.25–1 km of the observation point (Fig. 1). **North** station, operated every year since 1990, is located 100 m east and 50 m north of the observation point at an elevation of 2,790 m. **West** station, operated every year since 1991, is located 0.5 km southwest of the observation point at an elevation of 2,684 m.

Many factors make the Manzano Lookout well suited for observing consistent flights of fall migrating raptors. Several mountain ranges to the north serve as leading lines (Bildstein 2006), which cause raptors to funnel into the area. The Manzano Mountains are also a relatively narrow and well-defined north–

south range, which creates beneficial updrafts and serves as a distinct flight path for migrating raptors. Capilla Peak provides an excellent source of orographic lift, with two other peaks located 10–15 km north of the observation site also attracting southbound migrants that benefit from strong ridge updrafts. The concentration effect of the Manzano range is further enhanced by the absence of parallel ranges nearby to serve as alternate flight paths.

METHODS

STANDARDIZED COUNTS

Two official or designated observers, relieved or supplemented by other trained volunteers, conducted standardized daily counts of migrating raptors from a single, traditional observation site. Lead Observer Robert Baez is a four year HWI veteran counter with experience at Corpus Christi, Texas; Commissary Ridge, Wyoming; Bonney Butte, Oregon, and two years now at the Manzanos. For secondary counter Sarah Dudek was secondary counter and this was her first season at a raptor migration monitoring site. Three-year Manzano veteran Ian Dolly also helped with counts, as part of his r multi-task banding and count position. Volunteers and other other occasional crewmembers also assisted with the counts, particularly Roger Grimshaw and Steve deLaPena, both of whom have been volunteered for several years. (See Appendix A for a complete history of observer participation.) Weather permitting, observations began no later than 0900 H Mountain Standard Time (MST) and typically ended by 1700 H MST.

Data gathering and recording followed standardized protocols used at all HWI migration sites (Hoffman and Smith 2003). The observers routinely recorded the following data:

1. Species, age, sex, and color morph of each migrant raptor, whenever possible and applicable (Appendix A lists common and scientific names for all species, information about the applicability of age, sex, and color morph distinctions, and two-letter codes used to identify species in some tables and figures).
2. Hour of passage for each migrant; e.g., the df1000–1059 H MST.
3. Wind speed and direction, air temperature, percent cloud cover, predominant cloud type(s), presence or of precipitation, visibility, and an assessment of thermal-lift conditions, recorded for each hour of observation on the half hour.
4. Predominant direction, altitude, and distance from the lookout of the flight during each hour.
5. Total minutes observed and the mean number of observers present during each hour (included designated observers plus volunteers/visitors who actively contributed to the count [active scanning, pointing out birds, recording data, etc.] for more than 10 minutes in a given hour), recorded on the hour.
6. A subjective visitor-disturbance rating (high, moderate, low, none) for each hour, recorded on the hour.
7. Daily start and end times for each official observer.

Calculation of “adjusted” (to standardize sampling periods and adjust for incompletely identified birds) passage rates (migrants counted per 100 hours of observation) and analysis of trends updated through 2013 follows Farmer et al. (2007). In comparing 2013 annual statistics against means and 95% confidence intervals for previous seasons, we equate significance with a 2013 value falling outside the bounds of the confidence interval for the associated mean.

TRAPPING AND BANDING

Weather permitting, rotating crews of two to three trappers and processors operated each trapping station. The crews generally trapped between 0800–0900 and 1600–1700 H MST. Capture devices included mist

nets, dho-gaza 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 (Hoffman et al. 2002). All birds were released within 30 minutes of capture.

2013 RESULTS AND DISCUSSION

OBSERVATION EFFORT AND WEATHER SUMMARY

The count normally ends on 05 November, but a winter storm caused operations to end a day early. Observers counted on 67 of 71 possible days between 27 August and 05 November, for a total of 542.92 hours (Appendix C). Only one of these 67 days had a shortened (<4 hrs) count , due to weather. Weather varies throughout every season, in 2013 based on hourly recording of conditions it was clear 52% of the time, hazy 18% of the time, foggy 2% of the time, and rainy 5% of the time.

2013 FLIGHT SUMMARY

Overall Flight:

A total of 5,015 migrating raptors representing 18 species were counted during the 2013 season, a 7% decrease compared to the long-term average (Table 1). The flight consisted of 41% accipiters, 38% buteos, 11% vultures, 7% falcons, 2% eagles, 0.9% Ospreys, 0.4% harriers, and 0.2% unknown raptors. The proportions of buteos, and Turkey Vultures were above historic averages; while accipiters, falcons, eagles, and Northern Harriers were below historic averages (Fig. 2). The most abundant species counted was Swainson's Hawks (26% of the total), followed by Sharp-shinned Hawks (25%), Cooper's Hawks (14%), Red-tailed Hawks (11%), Turkey Vultures (11%), American Kestrels (2%), and Golden Eagles (2%). The remaining species each accounted for 1% or less of the total count (Table 1).

The following sections summarize the 2013 count relative to historic means at the site, and any statistically significant ($p < 0.05$) or near significant ($p < 0.1$) population trends based on first and second order regression analysis. HWI only depicts significant trends for species with a historic average count rate greater than or equal to 10 individuals per 100 hours. The rationale is that trends for counts below this point likely do not contain biologically meaningful information on regional populations—species with counts this low likely have a very dispersed migration, and alternate primary migration route, or large portions of the population that are resident. We do include count information in the reports, as occurrences of rarer species are of interest to both managers and the general public, and could represent the beginning of meaningful long-term changes.

Vultures, Osprey, and Harriers (Fig. 3a):

For the third straight year Turkey Vulture counts were above historic averages for the Manzano site. Osprey counts were also above average in 2013. Northern Harrier counts were below average for the fourth consecutive season.

Accipiters (Fig. 3b):

Counts for Sharp-shinned Hawks, Cooper's Hawks and Northern Goshawks were all below historic averages for the Manzanos in 2013. Cooper's Hawk populations have a significant quadratic trend ($p = 0.0043$) over the long term with numbers declining since around 2002.

Buteoine Hawks (Fig. 3c):

The 2013 flight in line with historic averages for Broad-winged, Swainson's, and Ferruginous Hawks. Red-tailed Hawks were counted in below average numbers in 2013, marking the eight straight year of below average counts at the Manzanos. Red-tailed Hawks have been declining at the site since the early

2000's ($p = 0.006$), which could signify declining regional populations or a shift to more resident behavior for some birds.

Eagles (Fig.3d):

Both Golden and Bald Eagle passage rates were low compared to historic averages in 2013. Over the long-term Golden Eagle counts have been stable at the Manzano site; noteworthy because the species is declining in many other regions based on migration counts.

Falcons (Fig. 3e):

The 2013 flight was above average for Merlins and Peregrine Falcons, average for Prairie Falcons, and below average for American Kestrels. This marks the 8th consecutive year of below average counts for Kestrels and regional populations are declining over thelong term based on Manzano data ($r^2 = 0.44$, $p = 0.00008$). These declines are consistent with findings at regional monitoring sites across North America. HWI, along with other North American researchers and Citizen Scientists have partnered to understand these declines locally and at the continental scale under the umbrella of the American Kestrel Partnership (http://kestrel.peregrinefund.org/). Peregrine Falcon counts have increased over the long-term ($r^2 = 0.292$, $p = 0.002$), a good sign for the recovery of regional populations for this species.

TRAPPING EFFORT

Trapping occurred on 60 of 63 days between 29 August and 30 October, totaling 79 stations days and 527.75 station hours between two stations (Appendix D). The number of trapping days was above average, but the total station days and hours were below the long-term means (Appendix D).

A total of 709 raptors of eleven species were captured and banded, which is well below the historic average (Appendix D). Swainson's Hawk and Peregrine Falcon captures were higher than historic averages, Merlin capture totals were on par, but all other species capture totals were below average (Table 2).

ENCOUNTERS WITH PREVIOUSLY BANDED BIRDS

A total of 132 birds banded at Manzano Mountains have been recovered elsewhere and reported to the Bird Banding Laboratory (Fig. 4). During 2013 we received notic of three recoveries: two Cooper's Hawks (one male and one female) and one female Sharp-shinned Hawk (Fig. 4, Table 4) and all three birds were found in Colorado. Both Cooper's Hawks were banded during the 2010 fall migration season. The male was banded as a hatch-year bird and recovered dead. The female Cooper's Hawk was banded as an adult. The Sharp-shinned Hawk was banded as a hatch-year bird in 2012.

During the season, there was one recapture (Appendix D) of a female Sharp-shinned Hawk that was originally banded at the site on 17 September, 2012. This bird was recaptured on 29 August, 2013.

SITE VISITATION

This past season was the first since 2007 that the access road leading to the top of the mountain from the public campground was open. An extensive wildfire in early 2008 caused the road to be closed to the general public for safety reasons and for maintenance, and repairs. During the season, a total of 124 individuals visited the site, primarily from New Mexico, but visitors also came from Minnesota, Ohio, Maryland, and New York. Visitors learned about raptor migration ecology and what banding and counting efforts can tell us about regional raptor populations and the health of the landscapes they use.

ACKNOWLEDGMENTS

Financial support was provided by the USDA Forest Service – Cibola National Forest and Region 3, New Mexico Department of Game and Fish: Share with Wildlife Fund, Kirkham's Outdoor Products, Patagonia, REI, and HWI private donors and members. A very special thanks goes to Zach Parsons, Karen Lessard, and Beverly DeGruyter of the U.S. Forest Service for providing financial and ongoing logistical support.

As always, we especially want to thank our local New Mexico community of volunteers for providing their long-term community and logistical support: Walt and Jennifer Lehman, Roger Grimshaw, Steve deLaPena, Renee Freeman, Sue Chavez & Peter Neils, Helen Haskell & Morris Albert, Steve and Nancy Cox, and Walt and Jennifer Lehman. All of these individuals not only give their personal time and financial support, but they also do wonderful things for our crews. Wes Anderson, as well as Steve and Nancy Cox also get special thanks for their continued support providing lure birds for our banding operations. A huge thank you also goes to Bobbie Posey, who is our New Mexico Office Administrator for all the tremendous work that she puts into local outreach and communication, on top of her administrative and logistical support duties.

Finally, enormous thanks to all of the members our 2013 field crew: Teresa Ely, Robert Baez, Ben Dudek, Sarah Dudek, Ian Dolly, and Scott Jernigan; in addition to the veteran volunteers listed above who continue to return to help ensure annual success. Without your skill, dedication, and willingness to brave the elements over the course of a long field season these efforts would not be possible.

LITERATURE CITED

Bechard, M. J., and J. K. Schmutz. 1995. Ferruginous Hawk (Buteo regalis), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America. Online: http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/172

Bildstein, K. L. 2001. Why migratory birds of prey make great biological indicators. Pages 169–179 *in* K. L. Bildstein and D. Klem (Editors). Hawkwatching in the Americas. Hawk Migration Association of North America, North Wales, Pennsylvania, USA.

DeLong, J. P., and S. W. Hoffman. 2004. Fat stores of migrating Sharp-shinned and Cooper's Hawks in New Mexico. Journal of Raptor Research 38:163–168.

Farmer, C. J., L. J. Goodrich, E. Ruelas Inzunza, and J. P. Smith. 2008. Conservation status of North America's birds of prey. Pages 303–420 *in* K. L. Bildstein, J. P. Smith, E. Ruelas Inzunza, and R. R. Veit (Editors), State of North America's birds of prey. Series in Ornithology No. 3. Nuttall Ornithological Club, Cambridge, Massachusetts, and American Ornithologists' Union, Washington, DC.

Farmer, C. J., D. J. T. Hussell, and D. Mizrahi. 2007. Detecting population trends in migratory birds of prey. Auk 124:1047–1062.

Goodrich, L. J., and J. P. Smith. 2008. Raptor migration in North America. Pages 37–150 *in* K. L. Bildstein, J. P. Smith, E. Ruelas Inzunza, and R. R. Veit (Editors), State of North America's birds of prey. Series in Ornithology No. 3. Nuttall Ornithological Club, Cambridge, Massachusetts, and American Ornithologists' Union, Washington, DC.

Hoffman, S. W., and J. P. Smith. 2003. Population trends of migratory raptors in western North America, 1977–2001. Condor 105:397–419.

Hoffman, S. W., J. P. Smith, and T. D. Meehan. 2002. Breeding grounds, winter ranges, and migratory routes of raptors in the Mountain West. Journal of Raptor Research 36:97–110.

Katzner, T., B.W. Smith, T.A. Miller, D. Brandes, J. Cooper, M. Lanzone, D. Brauning, C. Farmer, S. Harding, D.E. Kramar, C. Koppie, C. Maisonneuve, M. Martell, E.K. Mojica, C. Todd, J.A. Tremblay, M. Wheeler, D.F. Brinker, T.E. Chubbs, R. Gubler, K. O'Malley, S. Mehus, B. Porter,

R.P. Brooks, R.D. Watts, and K.L. Bildstein. 2012. Status, biology, and conservation priorities for North America's eastern Golden Eagle (*Aquila chrysaetos*) population. Auk 129:168-176.

Lott, C. A., and J. P. Smith. 2006. A geographic-information-system approach to estimating the origin of migratory raptors in North America using hydrogen stable isotope ratios in feathers. The Auk 123:822–835.

McBride, T. J., J. P. Smith, H. P. Gross, and M. Hooper. 2004. Blood-lead and ALAD activity levels of Cooper's Hawks (*Accipiter cooperii*) migrating through the southern Rocky Mountains. Journal of Raptor Research 38:118–124.

Smith, J. P., C. J. Farmer, S. W. Hoffman, G. S. Kaltenecker, K. Z. Woodruff, and P. Sherrington. 2008a. Trends in autumn counts of migratory raptors in western North America. Pages 217–252 *in* K. L. Bildstein, J. P. Smith, E. Ruelas Inzunza, and R. R. Veit (Editors), State of North America's birds of prey. Series in Ornithology No. 3. Nuttall Ornithological Club, Cambridge, Massachusetts, and American Ornithologists' Union, Washington, DC.

Smith, J. P., C. J. Farmer, S. W. Hoffman, C. A. Lott, L. J. Goodrich, J. Simon, C. Riley, and E. Ruelas Inzunza. 2008b. Trends in autumn counts of migratory raptors around the Gulf of Mexico, 1995–2005. Pages 253–278 *in* K. L. Bildstein, J. P. Smith, E. Ruelas Inzunza, and R. R. Veit (Editors), State of North America's birds of prey. Series in Ornithology No. 3. Nuttall Ornithological Club, Cambridge, Massachusetts, and American Ornithologists' Union, Washington, DC.

Smith, J. P., P. Grindrod, and S. W. Hoffman. 2001. Migration counts indicate Broad-winged Hawks are increasing in the West: evidence of breeding range expansion? Pages 93–106 *in* K. L. Bildstein and D. Klem (Editors), Hawkwatching in the Americas. Hawk Migration Association of North America, North Wales, Pennsylvania, USA.

Wheeler, B. K. 2003. Raptors of western North America: The Wheeler guide. Princeton University Press. Princeton, New Jersey, USA

Zalles, J. I., and K. L. Bildstein (Editors). 2000. Raptor watch: a global directory of raptor migration sites. BirdLife Conservation Series No. 9. BirdLife International, Cambridge, United Kingdom, and Hawk Mountain Sanctuary Association, Kempton, Pennsylvania, USA.

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: 1985–2012 versus 2013.

	COUNTS			RAPTORS / 100 HRS[1]		
SPECIES	1985–2012[2]	2013	% CHANGE	1985–2012[2]	2013	% CHANGE
Turkey Vulture	382 ± 87.1	527	+38	108.1 ± 23.84	148.7	+38
Osprey	30 ± 6.2	44	+49	7.6 ± 1.48	11.7	+53
Northern Harrier	59 ± 9.3	18	-69	11.8 ± 1.72	3.2	-73
Sharp-shinned Hawk	1478 ± 161.5	1263	-15	355.3 ± 35.05	293.6	-17
Cooper's Hawk	981 ± 129.4	703	-28	279.1 ± 31.63	202.4	-27
Northern Goshawk	17 ± 3.3	9	-46	3.7 ± 0.81	1.7	-53
Unknown small accipiter[3]	110 ± 30.6	73	-34	–	–	–
Unknown large accipiter[3]	5 ± 2.2	1	-82	–	–	–
Unidentified accipiter	66 ± 24.4	0	-100	–	–	–
TOTAL ACCIPITERS	2591 ± 273.9	2049	-21	–	–	–
Broad-winged Hawk	8 ± 1.8	9	+15	2.7 ± 0.60	2.7	0
Swainson's Hawk	888 ± 618.5	1317	+48	326.6 ± 225.48	521.8	+60
Red-tailed Hawk	614 ± 65.2	570	-7	132.2 ± 13.44	116.5	-12
Ferruginous Hawk	12 ± 1.8	11	-9	2.5 ± 0.42	2.3	-9
Rough-legged Hawk	0.3 ± 0.2	2	+700	0.1 ± 0.03	0.4	+709
Zone-tailed Hawk	1 ± 0.4	1	+56	–	–	–
Unidentified buteo	23 ± 8.3	13	-45	–	–	–
TOTAL BUTEOS	1545 ± 614.5	1922	+24	–	–	–
Golden Eagle	116 ± 11.9	89	-24	24.7 ± 2.66	18.5	-25
Bald Eagle	3 ± 0.9	2	-42	0.9 ± 0.25	0.5	-45
Unidentified Eagle	1 ± 0.8	0	-100	–	–	–
TOTAL EAGLES	121 ± 12.0	91	-25	–	–	–
American Kestrel	498 ± 64.8	230	-54	133.3 ± 17.70	57.9	-57
Merlin	29 ± 5.9	33	+15	7.1 ± 1.33	8.0	+12
Prairie Falcon	18 ± 4.0	18	-1	4.0 ± 0.82	3.6	-8
Peregrine Falcon	48 ± 11.9	71	+47	11.6 ± 2.85	16.9	+45
Unknown small falcon[3]	2 ± 0.7	1	-43	–	–	–
Unknown large falcon[3]	4 ± 2.2	2	-44	–	–	–
Unidentified falcon	2 ± 1.0	0	-100	–	–	–
TOTAL FALCONS	598 ± 69.3	355	-41	–	–	–
Unidentified raptor	39 ± 14.4	8	-79	–	–	–
GRAND TOTAL	5365 ± 755.6	5015	-7	–	–	–

[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: 1991–2012 versus 2013.

	Capture Total		Capture Rate[1]		Capture Success (%)[2]	
Species	1991–2012[3]	2013	1991–2012[3]	2013	1991–2012[3]	2013
Northern Harrier	4 ± 1.4	2	0.5 ± 0.12	0.4	7 ± 2.2	11
Sharp-shinned Hawk	450 ± 84.6	387	57.3 ± 5.57	73.3	28 ± 3.8	30
Cooper's Hawk	332 ± 62.9	257	42.5 ± 4.78	48.7	29 ± 3.5	35
Northern Goshawk	5 ± 1.5	3	0.6 ± 0.22	0.6	27 ± 8.3	33
Broad-winged Hawk	0.3 ± 0.20	0	0.05 ± 0.032	0.0	3 ± 2.1	0
Swainson's Hawk	0.2 ± 0.29	2	0.03 ± 0.031	0.4	0 ± 0.2	0
Red-tailed Hawk	46 ± 9.8	31	5.9 ± 0.89	5.9	7 ± 1.2	5
Zone-tailed Hawk	0.0 ± 0.09	0	0.003 ± 0.007	0.0	5 ± 8.9	0
Golden Eagle	4 ± 1.0	3	0.5 ± 0.14	0.6	3 ± 0.6	3
American Kestrel	31 ± 10.0	10	3.7 ± 0.93	1.9	6 ± 1.3	4
Merlin	5 ± 1.5	5	0.6 ± 0.20	0.9	15 ± 5.3	15
Prairie Falcon	4 ± 1.2	1	0.4 ± 0.11	0.2	16 ± 3.3	6
Peregrine Falcon	5 ± 1.7	6	0.7 ± 0.20	1.1	9 ± 2.4	8
All Species	885 ± 164.4	709	112.8 ± 10.71	134.3	20 ± 2.4	23

[1] Captures / 100 station hours.

[2] Number of birds captured / number of birds observed. The combined-species value was calculated excluding Ospreys, Turkey Vultures, 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.

Table 3. Foreign encounters with raptors originally banded in the Manzano Mountains, NM: 2013.

BAND #	SPECIES[1]	SEX	BANDING AGE[1]	BANDING DATE	ENCOUNTER DATE	ENCOUNTER AGE[2]	ENCOUNTER LOCATION	DISTANCE (KM)	STATUS
0874 – 00882	CH	M	HY	28-Sep-10	April-13	ASY	Rangely, CO	501	found dead – cause unknown
1075 – 02486	CH	F	ASY	06-Oct-10	26-Sep-13	ATY	Woody Creek, CO	404	found dead – collision
1623 – 22169	SS	F	HY	22-Sep-12	28-Nov-13	SY	Allenpark, CO	506	found dead – cause unknown

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

[2] HY = hatch year; SY = second year; TY = third year; AHY = after hatch year; ASY = after second year; ATY = after third year.

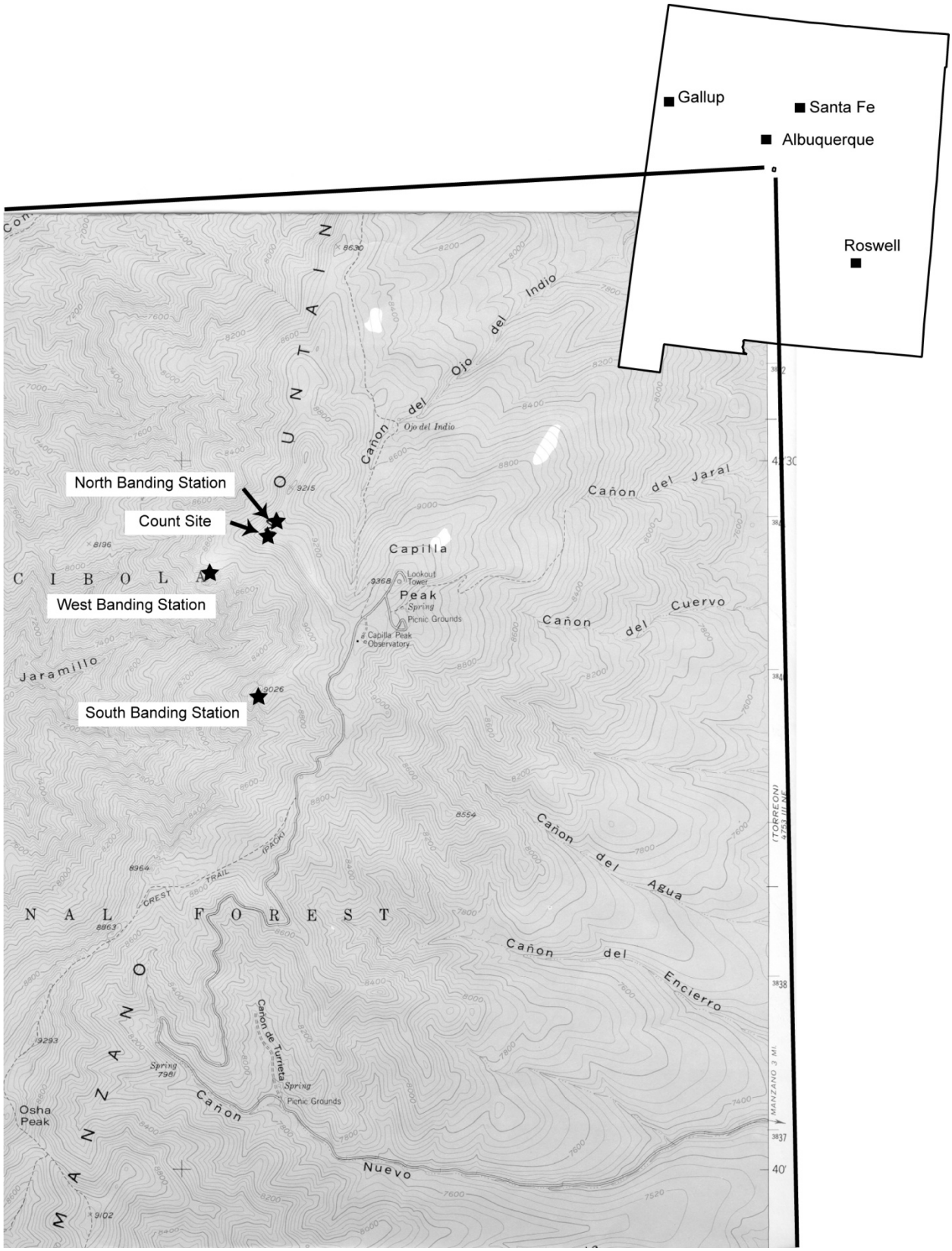

Figure 1. Map of the Manzano Mountains raptor-migration study site in central New Mexico.

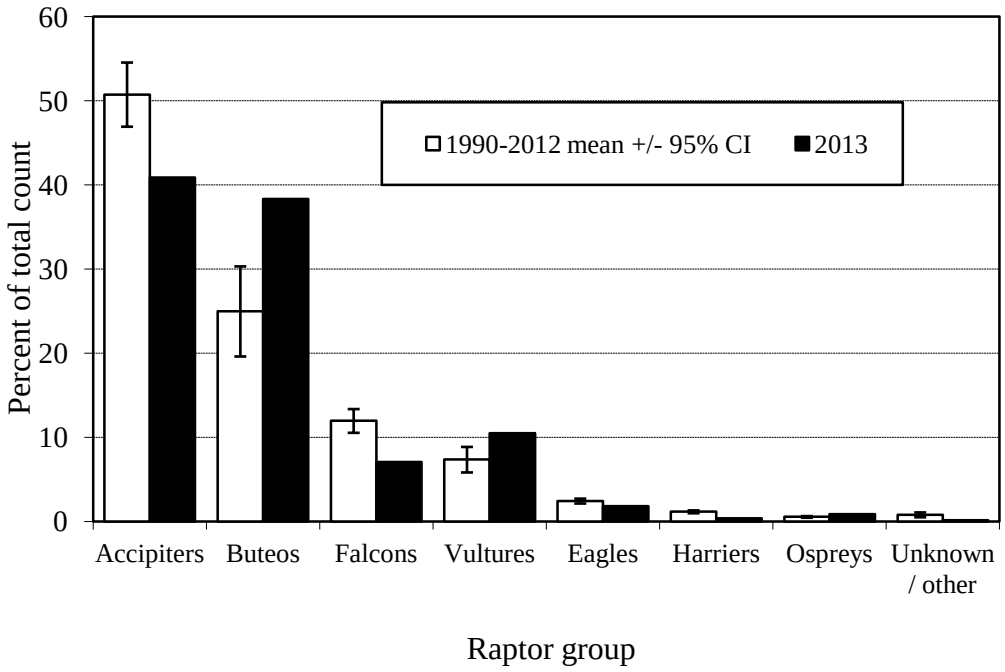

Figure 2. Fall raptor-migration flight composition by major species groups in the Manzano Mountains, NM: 1985–2012 versus 2013.

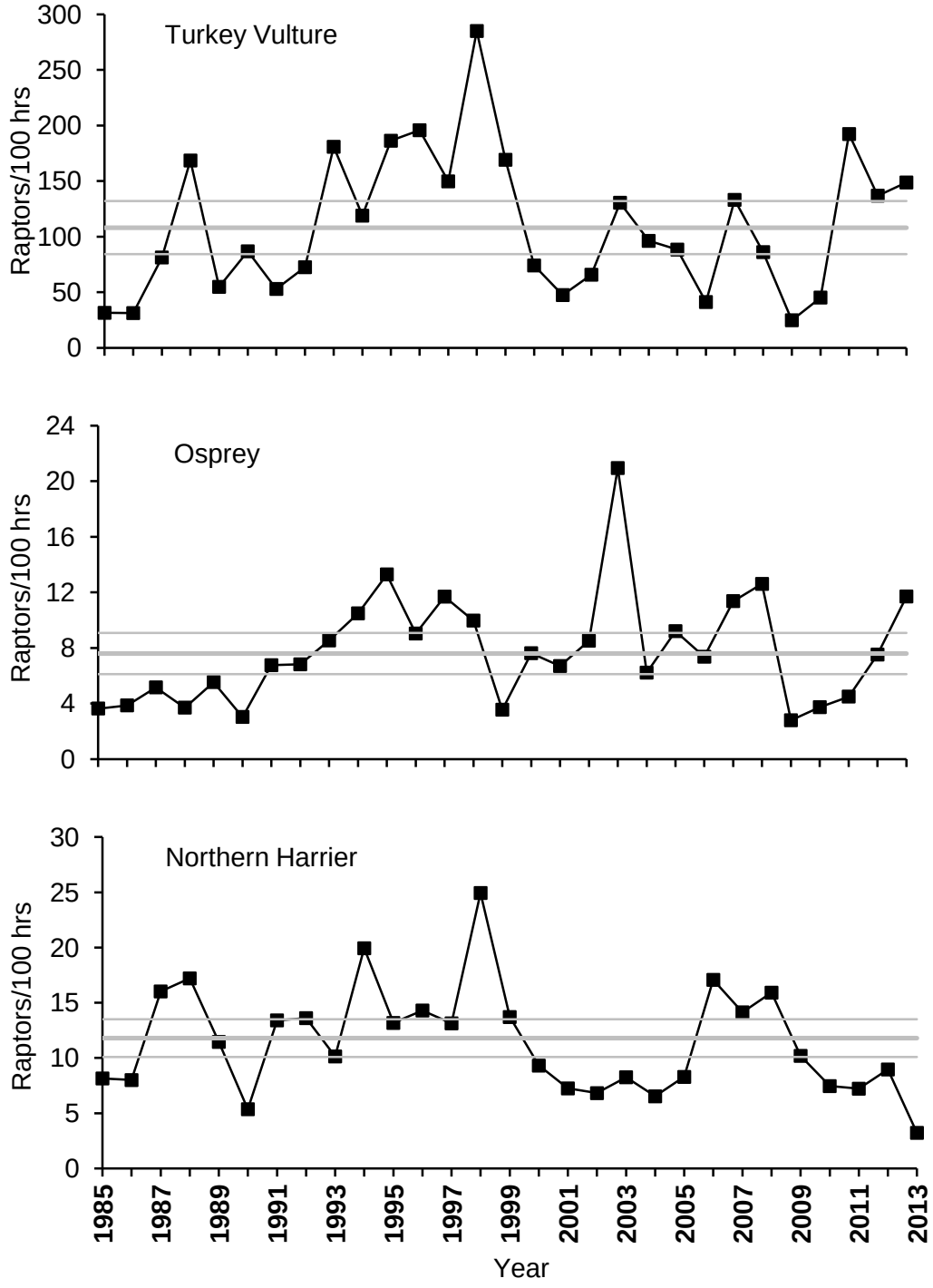

Figure 3a. Adjusted fall-migration passage rates at Manzano Mountains, NM for Turkey Vultures, Ospreys, and Northern Harriers: 1985–2013. Solid grey lines represent mean (thick) and upper and lower 95% confidence intervals (thin) of historic counts (1985-2012) at the Manzano Mountains.

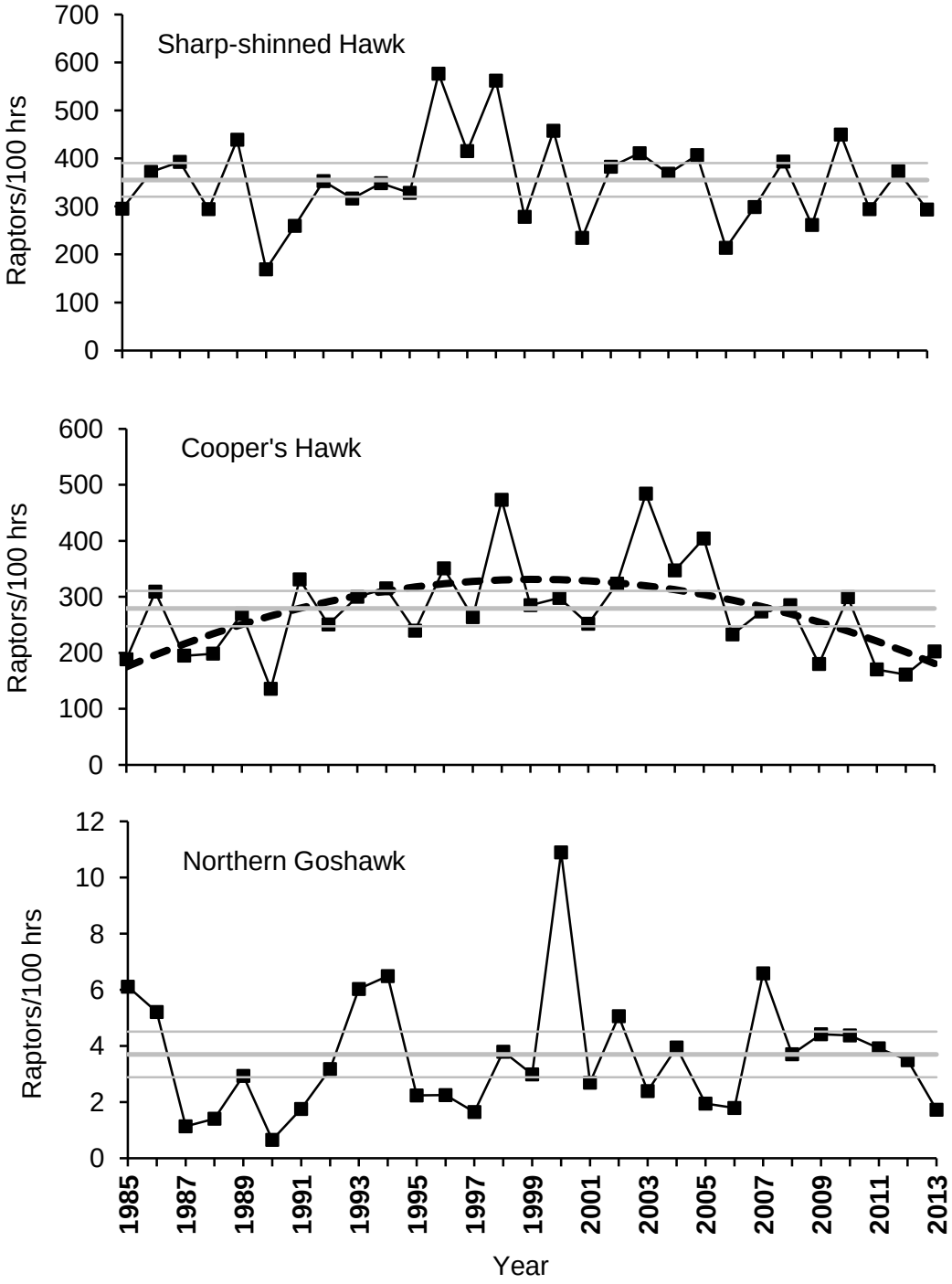

Figure 3b. Adjusted fall-migration passage rates at the Manzano Mountains, NM for the three North American accipiter species: 1985–2013. Dashed lines indicate trends for significant ($p < 0.05$) linear or quadratic regressions. Solid grey lines represent mean (thick) and upper and lower 95% confidence intervals (thin) of historic counts (1985-2012).

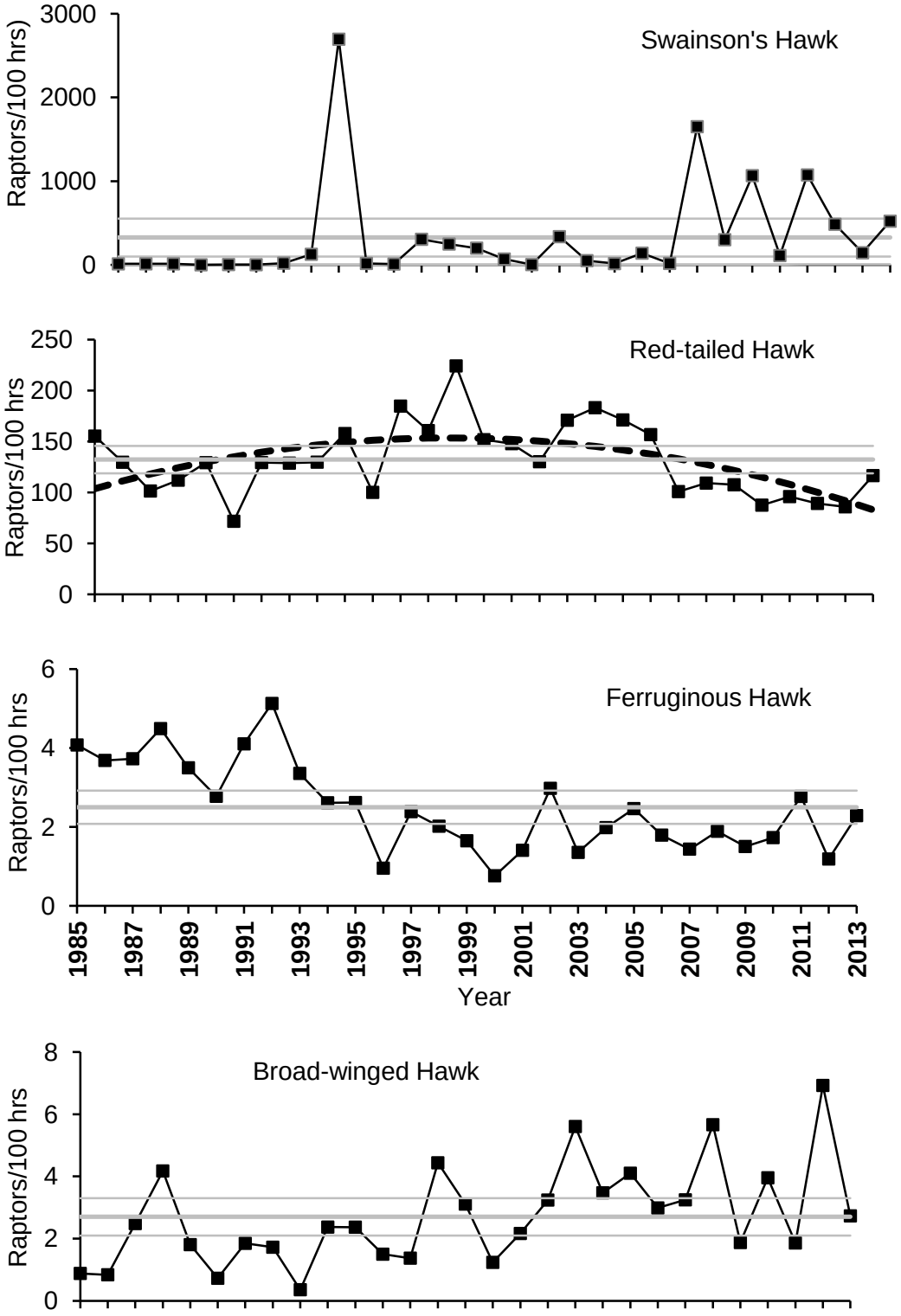

Figure 3c. Adjusted fall-migration buteo passage rates at Manzano Mountains, NM: 1985–2013. Dashed lines indicate significant ($p < 0.05$) population trends based on linear or quadratic regressions. Solid grey lines represent mean (thick) and upper and lower 95% confidence intervals (thin) of historic counts (1985-2012).

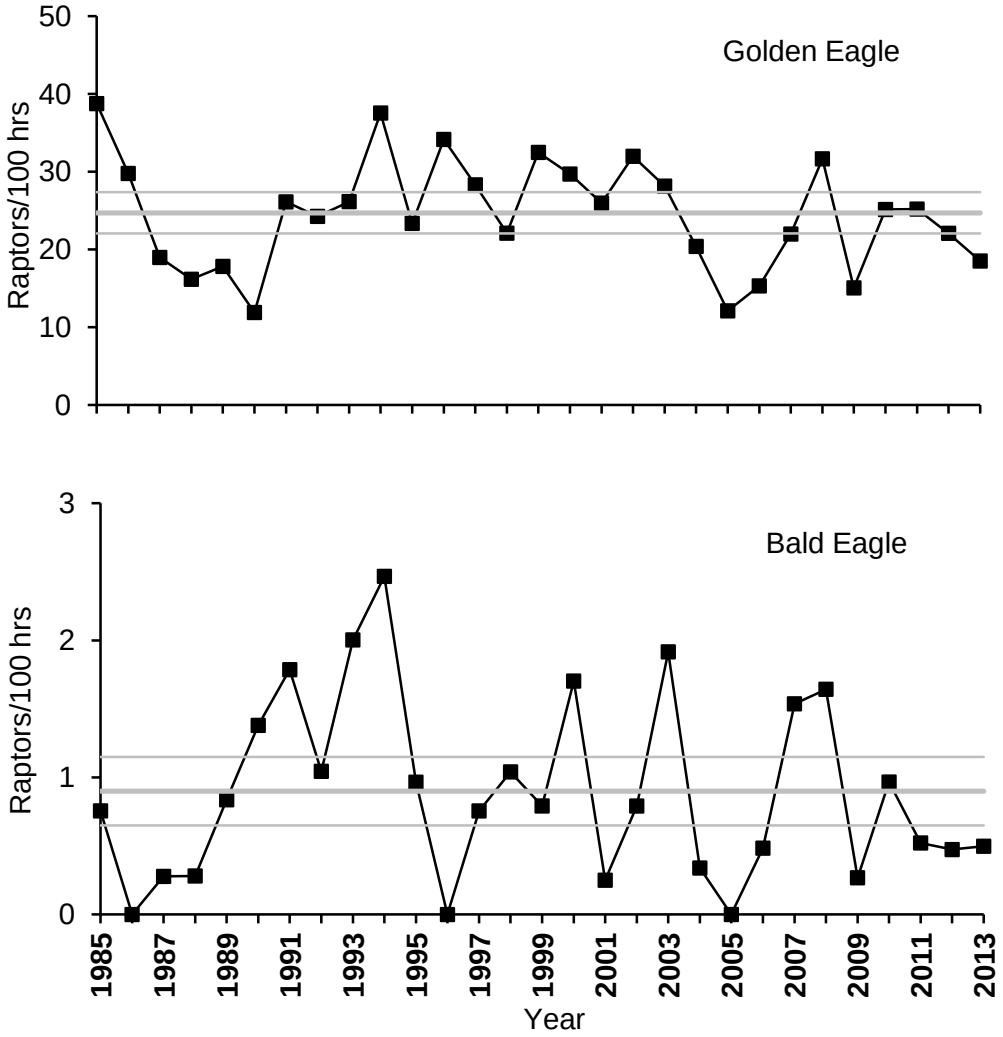

Figure 3d. Adjusted eagle passage rates for the fall migration at Manzano Mountains, NM: 1985–2013. Solid grey lines represent mean (thick) and upper and lower 95% confidence intervals (thin) of historic counts (1985-2012).

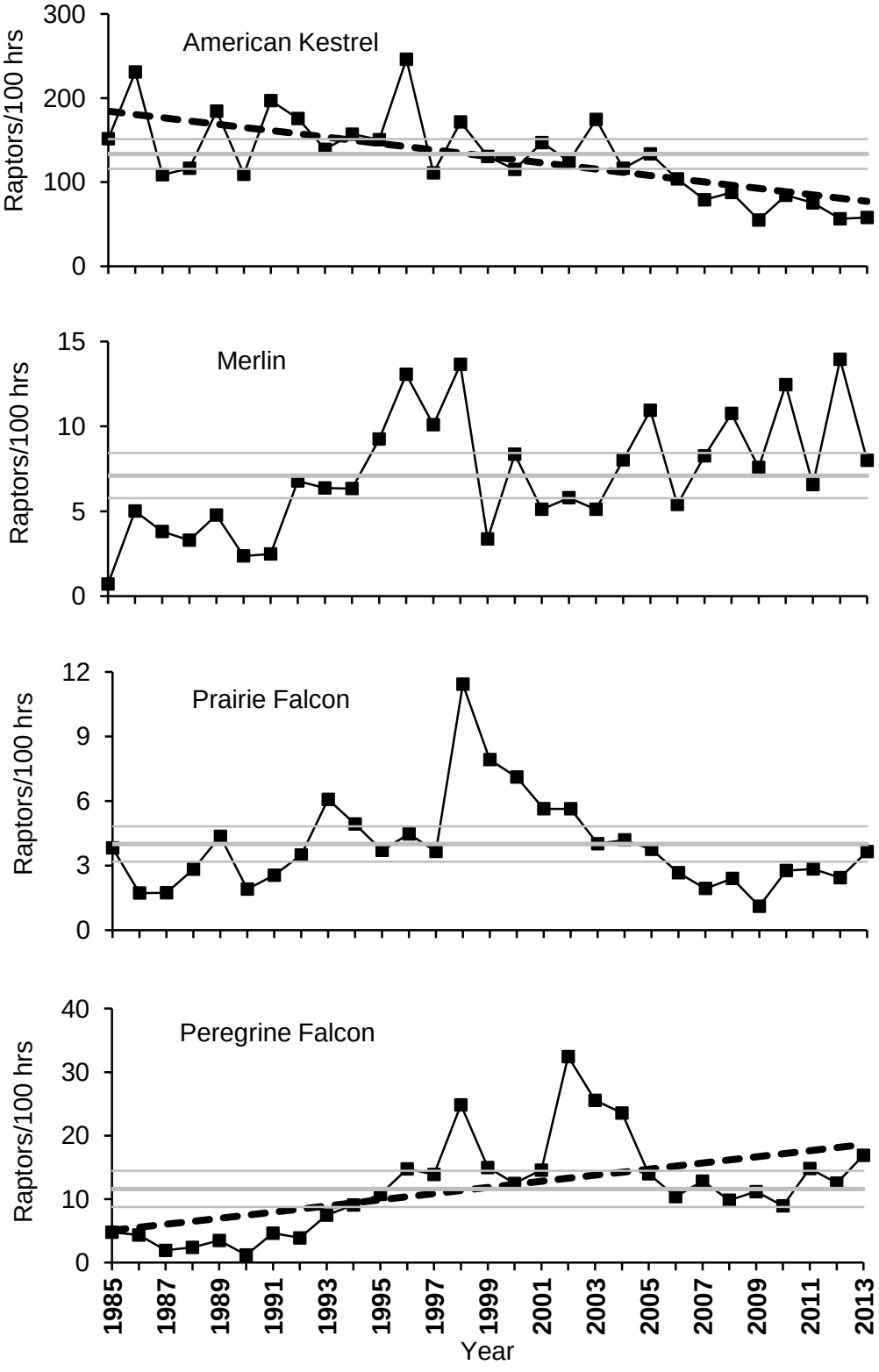

Figure 3e. Adjusted fall-migration falcon passage rates at Manzano Mountains, NM: 1985–2013. Dashed lines indicate significant ($p < 0.05$) population trends based on linear. Solid grey lines represent mean (thick) and upper and lower 95% confidence intervals (thin) of historic counts (1985-2012).

Figure 4. Foreign encounters of raptors banded at the Manzano Mountains Migration Project, NM. Green circles represent recaptures from 1990 to 2013, red stars represent 2013 recoveries

Appendix A. History of official observer participation in the Manzano Mountains Raptor Migration Project: 1985–2013.

1985 Single observer throughout, shared duty: Gary Cress (0)[1], Jim Daly (1), Allen Hale (1)

1986 Single observer throughout: Jim Daly (2)

1987 Single observer throughout: Jim Daly (3)

1988 Single observer throughout: Gordon Vickrey (1)

1989 Two observers during peak 3/4 of the season, one observer otherwise: Brett Ewald (2), Tim Menard (0)

1990 Two observers during peak 3/4 of the season, one observer otherwise: David Curson (0), Gary Cress (1)

1991 Two observers throughout: Eric Meyer (1), Tylan Dean (0)

1992 Two observers throughout: Eric Meyer (3), Jessie Jewell (0)

1993 Two observers throughout: Jessie Jewell (2), John Haskell (0)

1994 Two observers throughout: Jessie Jewell (4), Jeff Ogburn (1)

1995 Two observers throughout: Jessie Jewell (6), Jeff Ogburn (2)

1996 Two observers throughout: Jessie Jewell (8), Sean O'Connor (3)

1997 Two observers throughout: Jeff Ogburn (4), Sean O'Connor (4)

1998 Two observers throughout: Dan Rossman (1), Lawry Sager (0)

1999 Two observers throughout: Jason Beason (4), Lawry Sager (1)

2000 Two observers throughout: Jorge Canaca (1), Laura Lutz (1)

2001 Two observers throughout: Tim Meehan (1), Carrie Hisaoka (0)

2002 Two observers throughout: Carrie Hisaoka (1), Richard Sim (0)

2003 Two observers throughout: Carrie Hisaoka (2), Tim Hanks (1)

2004 Two observers throughout: Paula Shannon (3), Frank Mayer (2)

2005 Two observers throughout: Tim Hanks (2), Geoff Gould (0)

2006 Two observers throughout: Tim Hanks (3), Greg Levandoski (3)

2007 Two observers throughout: Tim Hanks (4), Aldo Raul Coutreras Reyes (4)

2008 Two observers throughout: Tim Hanks (5), Aldo Raul Coutreras Reyes (5), Roger Grimshaw (1)

2009 Two observers throughout: Kimberly Cullen (1), Amber Wingert (1), Roger Grimshaw (2)

2010 Two observers throughout: Tim Hanks (6+), Russell Seeley (0), Roger Grimshaw (3+)

2011 Two observers throughout: Tim Hanks (7+), Russell Seeley (1), Roger Grimshaw (4+)

2012 Two observers throughout: Robert Baez (3), Ian Dolly (+), Dan D. Tempest (0), Roger Grimshaw (5+), Steve deLaPena (+)

2013 Two observers throughout: Robert Baez (4), Sarah Dudek (0), Ian Dolly (1+), Roger Grimshaw (6+), Steve deLaPena (+)

[1] Numbers in parentheses indicate previous full seasons of observation experience.

Appendix B. 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 C. Annual observation effort and fall raptor migration counts by species (unadjusted data) in the Manzano Mountains, NM: 1985–2013.

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Start date	06-Sep	23-Aug	25-Aug	30-Aug	28-Aug	27-Aug	27-Aug	25-Aug	25-Aug	25-Aug
End date	02-Nov	31-Oct	04-Nov	31-Oct	31-Oct	31-Oct	05-Nov	05-Nov	05-Nov	02-Nov
Days of observation	50	63	65	60	63	62	67	70	68	66
Hours of observation	343.33	464.50	517.92	453.08	489.75	510.75	524.58	537.25	489.67	508.75
Raptors / 100 hours	843.2	863.9	758.6	772.3	955.4	494.6	825.6	946.3	2429.2	966.5
SPECIES	RAPTOR COUNTS									
Turkey Vulture	74	118	283	466	178	295	176	268	601	430
Osprey	10	14	19	13	22	12	24	26	31	38
Northern Harrier	28	36	78	78	59	27	66	69	48	97
Sharp-shinned Hawk	956	1300	1622	1118	1834	688	1080	1540	1193	1415
Cooper's Hawk	531	881	679	604	929	471	1105	961	944	1054
Northern Goshawk	21	20	7	6	14	3	8	16	27	30
Unknown small accipiter[1]	-	-	-	-	-	-	-	-	-	-
Unknown large accipiter[1]	-	-	-	-	-	-	-	-	-	-
Unknown accipiter	78	104	119	111	121	120	156	117	266	118
TOTAL ACCIPITERS	1586	2305	2427	1839	2898	1282	2349	2634	2430	2617
Broad-winged Hawk	2	2	7	10	5	2	5	5	1	7
Swainson's Hawk	27	33	44	3	16	9	58	344	7301	67
Red-tailed Hawk	513	527	457	486	604	329	577	667	566	707
Ferruginous Hawk	14	15	17	20	16	13	19	25	17	13
Rough-legged Hawk	0	0	0	1	1	0	0	0	0	0
Zone-tailed Hawk	0	0	0	0	0	0	0	2	0	1
Unknown buteo	21	12	11	16	4	19	30	11	31	22
TOTAL BUTEOS	577	589	536	536	646	372	689	1054	7916	817
Golden Eagle	133	123	86	67	85	52	124	119	120	172
Bald Eagle	2	0	1	1	3	4	7	4	7	9
Unknown Eagle	0	0	0	4	0	4	0	0	0	0
TOTAL EAGLES	135	123	87	72	88	60	131	123	127	181
American Kestrel	421	755	426	385	677	409	728	704	520	582
Merlin	2	16	17	12	18	9	10	28	24	24
Prairie Falcon	13	7	8	12	19	9	14	17	27	22
Peregrine Falcon	14	15	7	10	15	5	21	18	31	37
Unknown small falcon[1]	-	-	-	-	-	-	-	-	-	-
Unknown large falcon[1]	-	-	-	-	-	-	-	-	-	-
Unknown falcon	4	0	1	0	3	5	3	1	0	1
TOTAL FALCONS	454	793	459	419	732	437	776	768	602	666
Unknown raptor	31	35	40	76	56	41	120	142	140	71
TOTAL	2895	4013	3929	3499	4679	2526	4331	5084	11895	4917

Appendix C. continued

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Start date	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	28-Aug
End date	08-Nov	05-Nov	5-Nov	5-Nov	5-Nov	2-Nov	4-Nov	3-Nov	5-Nov	30-Oct
Days of observation	70	59	68	65	70	57	68	65	69	57
Hours of observation	560.00	461.67	565.08	559.58	553.77	434.33	545.47	518.50	577.25	424.08
Raptors / 100 hours	832.9	1545.9	1044.8	1594.2	873.1	991.6	855.8	972.0	1126.4	1039.9
SPECIES	RAPTOR COUNTS									
Turkey Vulture	636	640	563	1116	637	241	164	239	468	289
Osprey	53	33	47	44	14	25	26	32	86	20
Northern Harrier	72	64	69	133	69	38	37	33	50	27
Sharp-shinned Hawk	1519	2174	1872	2585	1212	1698	1032	1524	1861	1268
Cooper's Hawk	907	1205	1018	2025	1069	984	913	1149	1758	964
Northern Goshawk	11	9	9	19	14	42	13	23	12	15
Unknown small accipiter[1]	-	-	-	-	-	-	86	188	205	169
Unknown large accipiter[1]	-	-	-	-	-	-	0	3	5	4
Unknown accipiter	44	147	76	107	51	29	0	11	5	28
TOTAL ACCIPITERS	2481	3535	2975	4736	2346	2753	2044	2898	3846	2448
Broad-winged Hawk	7	4	5	14	12	3	6	9	16	6
Swainson's Hawk	32	867	679	572	194	19	815	139	53	291
Red-tailed Hawk	519	771	803	1151	733	591	632	778	924	636
Ferruginous Hawk	13	4	13	10	8	3	10	14	7	8
Rough-legged Hawk	0	0	0	1	1	0	1	0	0	0
Zone-tailed Hawk	1	0	1	2	0	3	1	1	0	0
Unknown buteo	9	11	3	28	5	2	106	32	30	69
TOTAL BUTEOS	581	1657	1504	1778	953	621	1571	973	1030	1010
Golden Eagle	136	151	145	115	159	115	128	149	146	79
Bald Eagle	4	0	3	4	3	5	1	3	8	1
Unknown Eagle	0	0	0	0	0	1	0	0	1	0
TOTAL EAGLES	140	151	148	119	162	121	129	152	155	80
American Kestrel	584	905	455	742	525	397	560	470	686	362
Merlin	42	48	42	56	14	27	21	22	22	26
Prairie Falcon	18	19	19	58	38	30	28	24	20	18
Peregrine Falcon	49	60	67	116	64	49	63	127	112	82
Unknown small falcon[1]	-	-	-	-	-	-	0	4	2	1
Unknown large falcon[1]	-	-	-	-	-	-	0	15	3	1
Unknown falcon	0	1	0	12	2	1	5	2	1	5
TOTAL FALCONS	693	1033	583	984	643	504	677	664	846	495
Unknown raptor	8	24	15	11	11	4	20	49	21	41
TOTAL	4664	7137	5904	8921	4835	4307	4668	5040	6502	4410

Appendix C. continued

	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Start date	27- Aug	27- Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	27-Aug	26-Aug
End date	5-Nov	5-Nov	5-Nov	5-Nov	5-Nov	4-Nov	4-Nov	5-Nov	4-Nov	2-Nov
Days of observation	69	68	63	69	68	70	68	70	67	66
Hours of observation	599.58	566.41	553.58	579.00	535.68	578.00	521.00	582.42	542.92	519.82
Raptors / 100 hours	937.8	1433.4	883.2	1327.5	577.0	1327.7	919.4	729.4	923.7	1030.8
SPECIES						RAPTOR COUNTS				
Turkey Vulture	363	150	499	315	82	189	668	481	527	382
Osprey	35	30	47	50	12	17	16	29	44	30
Northern Harrier	46	90	75	89	49	41	35	50	18	59
Mississippi Kite	–	–	–	–	–	–	1	–	–	1
Sharp-shinned Hawk	1842	958	1283	1836	1051	2067	1252	1665	1263	1478
Cooper's Hawk	1486	865	922	1084	620	1162	602	603	703	981
Northern Goshawk	10	10	30	21	21	23	18	18	9	17
Unknown small accipiter[1]	129	119	74	57	94	102	28	71	73	110
Unknown large accipiter[1]	5	2	7	10	12	9	8	0	1	5
Unknown accipiter	1	6	10	16	12	3	0	2	0	66
TOTAL ACCIPITERS	3473	1960	2326	3024	1810	3366	1908	2359	2049	2591
Broad-winged Hawk	13	9	10	17	6	13	5	19	9	8
Swainson's Hawk	52	4695	841	2952	274	2906	1204	371	1317	888
Red-tailed Hawk	823	534	537	575	398	491	410	435	570	614
Ferruginous Hawk	13	9	8	10	8	9	14	8	11	12
Rough-legged Hawk	0	0	0	1	0	0	0	1	2	0
Zone-tailed Hawk	1	0	0	0	0	1	4	0	1	1
Unknown buteo	33	23	19	11	57	22	10	9	13	23
TOTAL BUTEOS	935	5270	1415	3566	743	3442	1647	843	1923	1546
Golden Eagle	71	87	99	167	70	130	113	119	89	116
Bald Eagle	1	3	6	7	1	4	2	3	2	3
Unknown Eagle	4	1	9	2	4	4	5	0	0	1
TOTAL EAGLES	76	91	114	176	75	138	120	122	91	121
American Kestrel	520	412	298	350	216	359	288	224	230	498
Merlin	48	23	34	47	28	54	26	64	33	29
Prairie Falcon	16	13	10	11	6	13	13	12	18	18
Peregrine Falcon	61	43	51	42	43	40	58	57	71	48
Unknown small falcon[1]	2	1	0	1	4	2	2	2	1	2
Unknown large falcon[1]	5	3	2	2	3	5	3	1	2	4
Unknown falcon	6	1	1	1	2	0	0	0	0	2
TOTAL FALCONS	658	496	396	454	302	473	390	360	355	598
Unknown raptor	37	32	17	12	18	8	5	4	8	39
TOTAL	5623	8119	4889	7686	3091	7674	4790	4248	5015	5366

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

Appendix D. Annual trapping and banding effort and capture totals of migrating raptors by species in the Manzano Mountains, NM: 1990–2013.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Start date	28-Aug	05-Sep	31-Aug	03-Sep	01-Sep	04-Sep	02-Sep	31-Aug	29-Aug	31-Aug	02-Sep	01-Sep	03-Sep	07-Sep	05-Sep	04-Sep	04-Sep	02-Sep
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	28-Oct	28-Oct	24-Oct	27-Oct
Blinds in operation	1	3	3	3	3	4	4	4	3	3	3	3	3	2	2	2	2	2
Trapping days	47	54	57	50	48	53	45	54	58	46	50	55	51	45	45	51	48	47
Station days	47	95	131	120	121	136	132	151	165	94	119	145	131	84	84	99	94	105
Station hours	511	693	967	889	926	1041	1030	1211	1352	664	791	1037	957	633	756.15	707.77	677.67	452.97
Captures / 100 stn hrs	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	152.7	136.0	163.0	96.5	83.2
SPECIES	RAPTOR CAPTURES																	
Northern Harrier	1	2	2	3	9	2	1	8	14	0	5	7	6	3	0	3	6	3
Sharp-shinned Hawk	124	262	589	430	502	493	778	612	987	321	495	426	635	458	566	562	299	196
Cooper's Hawk	95	195	335	374	353	310	460	427	772	323	330	337	510	400	378	495	280	142
Northern Goshawk	1	7	6	6	7	1	5	3	6	6	16	1	10	1	2	3	3	3
Broad-winged Hawk	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	1	1
Swainson's Hawk	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	1	0
Red-tailed Hawk	8	18	61	55	83	50	50	46	112	56	76	39	56	38	43	35	35	9
Zone-tailed Hawk	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Golden Eagle	1	3	4	4	4	4	6	4	5	2	4	5	7	8	2	2	1	1
American Kestrel	10	13	42	14	59	28	92	32	75	44	25	56	37	43	18	37	10	9
Merlin	1	0	2	4	1	1	11	6	7	2	8	2	12	3	10	3	2	5
Prairie Falcon	1	1	3	5	3	1	3	5	13	6	3	7	5	4	3	4	4	2
Peregrine Falcon	2	1	2	1	4	2	5	7	12	8	1	10	13	7	5	10	12	6
All Species	244	502	1046	896	1025	892	1411	1150	2006	768	963	891	1295	966	1028	1154	654	377
Recaptures[1]	0	0	1	1	2	2	1	2	4	4	3	2	3	2	2	3	2	0
Foreign recaptures[2]	2	1	1	1	2	0	5	1	2	2	0	0	3	2	0	0	1	0
Foreign encounters[3]	0	2	2	3	6	6	7	8	13	12	6	7	10	7	5	3	4	6

[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.

Appendix D. continued

	2008	2009	2010	2011	2012	2013	TOTAL	MEAN
Start date	3-Sep	3-Sep	2-Sep	1-Sep	31-Aug	29-Aug		1-Sep
End date	30-Oct	27-Oct	27-Oct	28-Oct	28-Oct	30-Oct		25-Oct
Blinds in operation	2	2	2	2	2	2		2.7
Trapping days	56	48	52	46	56	60		50.5
Station days	80	61	61	58	76	79		95.0
Station hours	586.04	390.25	408.67	397.00	495.25	527.75		764.1
Captures / 100 stn hrs	104.8	133.8	93.5	80.6	121.6	134.3		110.0
SPECIES					RAPTOR CAPTURES			
Northern Harrier	4	2	2	2	2	2	89	3.8
Sharp-shinned Hawk	315	255	184	171	362	387	10409	435.7
Cooper's Hawk	247	201	160	105	171	257	7657	321.7
Northern Goshawk	3	8	2	1	2	3	106	4.5
Broad-winged Hawk	0	0	0	0	1	0	7	0.3
Swainson’s Hawk	0	0	0	0	0	2	7	0.2
Red-tailed Hawk	20	34	22	27	41	31	1045	44.1
Zone-tailed Hawk	0	0	0	0	0	0	1	0.0
Golden Eagle	9	1	1	1	4	3	86	3.6
American Kestrel	4	16	5	8	9	10	696	29.8
Merlin	8	2	2	3	8	5	108	4.5
Prairie Falcon	1	1	3	0	0	1	79	3.4
Peregrine Falcon	3	2	1	2	2	6	124	5.1
All Species	614	522	382	320	602	709	20416	856.8
Recaptures[1]	1	1	2	1	1	1	41	1.7
Foreign recaptures[2]	0	1	0	0	0	0	24	1.0
Foreign encounters[3]	5	5	2	1	4	3	132	5.6

[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.