

PEREGRINE FALCON NEST SITE MONITORING IN ARIZONA

2006 BREEDING-SEASON RESULTS

Final Report

Prepared by:

Dennis Abbate
Wildlife Specialist, Research Branch
Arizona Game and Fish Department



Submitted to:

Michael Green
National Coordinator
American Peregrine Falcon Monitoring Team
U.S. Fish and Wildlife Service

Arizona Game and Fish Department
Research Branch
2221 West Greenway Road
Phoenix, Arizona 85023

October 2006



RECOMMENDED CITATION

Abbate, D. 2006. Peregrine Falcon Nest Site Monitoring in Arizona: 2006 Breeding-Season Results. Arizona Game and Fish Department, Research Branch, Phoenix, Arizona.

ACKNOWLEDGEMENTS

Many people contributed to the success of the 2006 peregrine falcon monitoring effort. We would like to recognize all the participants and express our appreciation for their time and energy in helping to complete the project. The Arizona Game and Fish Department Research Branch organized and coordinated this year's work. Ray Schwiensburg and Michael Ingraldi provided administration. James Driscoll helped with early planning and organization. Alicia Sweezer and Sabra Schwartz provided baseline data from the Heritage Data Base, and assisted with location interpretation and mapping. Shawn Lowery provided territory location map and cover design for this report. Bill Burger coordinated monitoring in Region 6. Mikele Painter coordinated territory monitoring in the northern part of the state. Arizona Game and Fish Department monitors included: Henry Apfel, Scott Blackman, Eric Dotterer, Gunnar Erickson, Dave Grandmaison, Steve Goodman, Dan Groebner, Valerie Horncastle, Zach Hurst, Michael Ingraldi, Kenneth Jacobson, George Jones, Alicia Jontz, Sarah Lantz, Shawn Lowery, Susie MacVean, Ron Mixan, Nathan Muhn, Rob Nelson, Mikele Painter, Natalie Robb, Andi Rogers, Kari Signor, James Simmons, Angie Stingelin, Kathy Sullivan, Luke Thompson, Annina Thornburg, Lirain Urreiztieta, and Renee Wilcox. Territory monitors outside AGFD included: Scott Franklin and R. Wadsworth (Bureau of Land Management), Michael Ward (National Park Service), John Wilcox and Rainey Skidmore (U.S. Forest Service), Shelly Johnson (Northern Arizona University). Jack Allen, (Lake Havasu National Wildlife Refuge, U.S. Fish and Wildlife Service) provided logistical support. The cover photograph of the peregrine falcon was taken by George Andrejko.

AMERICANS WITH DISABILITIES ACT NOTIFICATION

The Arizona Game and Fish Department (AGFD) prohibits discrimination on the basis of race, color, sex, national origin, age, or disability in its programs and activities. If anyone believes that they have been discriminated against in any of the AGFD's programs or activities, including its employment practices, the individual may file a complaint alleging discrimination directly with the AGFD Deputy Director, 2221 W. Greenway Rd. Phoenix, AZ 85023, (602) 942-3000 or U.S. Fish and Wildlife Service, 4040 N. Fairfax Dr. Ste. 130, Arlington, VA 22203.

Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, or this document in an alternative format, by contacting the AGFD Deputy Director, 2221 W. Greenway Rd., Phoenix, AZ 85023, (602) 789-3290. Requests should be made as early as possible to allow sufficient time to arrange for accommodation.

FUNDING

Project funding was provided by the Arizona Game and Fish Department (AGFD) Heritage Fund, the U.S. Fish and Wildlife Service through Intergovernmental Agreement with AGFD, under Agreement No. 201815J864, and the Bureau of Land Management Intergovernmental Agreement with AGFD under Amendment 1 of Agreement No. AA050001 and Task Order AAF050030.

TABLE OF CONTENTS

Introduction.....	1
Methods.....	1
Definitions.....	1
Monitoring Description.....	2
Results and Discussion	2
Literature Cited.....	8

LIST OF TABLES

Table 1. 2006 Arizona Peregrine Falcon Monitored Nest Site Distribution and Rate of Occupancy by County.....	3
Table 2. Number of Peregrine Falcon Nest Sites within Land Management Areas.....	4
Table 3. Peregrine Falcon Nest Site Descriptions and Monitoring Results during the 2006 Breeding Season.....	6

LIST OF FIGURES

Figure 1. 2006 Peregrine Falcon Monitored Nest Site Locations.....	5
--------------------------------------------------------------------	---

LIST OF APPENDICES

Appendix 1. Peregrine Falcon Occupancy, Nest Success, Productivity Protocol	9
Appendix 2. Peregrine Falcon Occupancy, Nest Success, Productivity Data Form.....	15
Appendix 3. 2006 Peregrine Falcon Nest Site Monitoring Data Forms, Associated Maps and Photographic Records. (<i>Digital Format on attached CD</i>).	18

PEREGRINE FALCON NEST SITE MONITORING IN ARIZONA:
2006 BREEDING SEASON RESULTS

Dennis Abbate, Arizona Game and Fish Department Research Branch

INTRODUCTION

The U.S. Fish and Wildlife Service (FWS) is mandated by the Endangered Species Act to monitor the American peregrine falcon (*Falco peregrinus anatum*) for a minimum of five years after delisting. A "post-delisting monitoring plan" (plan) was developed in cooperation with States, other agencies, recovery team members and individual cooperators to assess population status and provide a system to detect declines in territory occupancy, nest success and productivity throughout the United States (U.S. Fish and Wildlife Service 2003). In support of this plan, and to fulfill the Arizona Game and Fish Department's (AGFD) commitment to the conservation of this species in Arizona, AGFD and its cooperators completed the first formal monitoring effort under the plan during the 2006 breeding season. The primary objectives were to determine territory occupancy status, assess nest success and ascertain productivity.

METHODS

A random sample of sixty historic PEFA territories in Arizona were selected by the FWS and provided to AGFD for monitoring during 2006, and subsequent survey years (Fig. 1). These nest sites were identified using Heritage Data Management System records and those from cooperating agencies and individuals. Territories were eligible for inclusion in the random selection of sites in Arizona if they had been occupied at least once from 1997 to 2002 (U.S. Fish and Wildlife Service 2003). Several sites were removed from the initial list due to poor access and limited visibility, and replaced with alternates. The monitoring protocol was adapted from the *Monitoring Plan for the American Peregrine Falcon: A Species Recovered Under the Endangered Species Act* (U.S. Fish and Wildlife Service 2003). We visited each targeted breeding area a minimum of 2 times to assess occupancy, and most sites were surveyed on 3 or more occasions to identify successful nests and estimate productivity.

Definitions

An "occupied territory" was defined as a territory where either a pair of peregrines is present (two adults or an adult/sub-adult mixed pair), or there is evidence of reproduction such as one adult sitting low in the nest for an extended time (incubation), eggs or young are observed, or food is delivered into the suspected nest site (eyrie or scrape).

A "successful nest" was defined as an occupied territory where one or more young is observed at ≥ 28 days of age. Age was determined using the age-photographs from Cade et al. (1996), documenting older nestlings with little or no down showing, and observing fledglings.

"Nest Productivity" was defined as the total number of young observed ≥ 28 days within a territory.

Monitoring Description

Monitoring sessions were conducted by one or two observers in 4-hour blocks, mostly during early morning (30 minutes before sunrise to 3.5 to 4 hours post sunrise) or evening (3.5 to 4 hours before sunset to 30 minutes post sunset). Observation times were shortened when objectives were completed in less than 4 hours. Some remote sites with difficult access or lengthy hiking times were monitored during 2 successive sessions. This strategy involved one evening observation, camping overnight, and completing the session during the early morning of the following day. Though observations were recorded on separate data forms, these back-to-back sessions were considered part of the same visit.

When no PEFA activity was detected during a monitoring session, observers were instructed to conduct a "reasonable" search for an alternate eyrie location within the area. Recommendations for this additional survey effort included a time limit equal to a monitoring session of 4-hours, and a search area of approximately 800m from the known eyrie. Monitoring protocol requirements and recommendations are summarized in the Peregrine Falcon Occupancy, Nest Success, Productivity Protocol (Appendix 1). All observations were documented on the Peregrine Falcon Occupancy, Nest Success, Productivity Data Form and supplemental sheets (Appendix 2 & 3).

RESULTS AND DISCUSSION

Monitored nest sites were distributed across a variety of biotic communities, and elevations ranged from a low of 122m (400 ft) at the Colorado River, to 2500m (8200 ft) in the Rincon Mountains of Pima County. The selected territories fell within 12 of 15 Arizona counties, with occupancy rates ranging from 40 to 100 percent (Table 1). Mohave County in the northwest part of the state contained the highest number of sites at 12, and La Paz County immediately to the south had only 1 monitored site (Fig. 1). The southern most active nest site in 2006 was the Sycamore Canyon Territory, southeast of Ruby, Santa Cruz County, Arizona. The northern most active nest was the Nine-Mile Draw Territory below Glen Canyon Dam, and within the Glen Canyon National Recreation Area. The Goldstrike Canyon territory below the Hoover Dam contained the furthest west occupied nest site, and the most eastern occupied site was within the Milligan /Maness Peak territory, approximately 4km west of the New Mexico state line in Greenlee County. Ownership and land management for specific nest site locations were distributed among 4 agencies and 2 local governments including the U.S. Forest Service (USFS), Bureau of Land Management (BLM), National Park Service (NPS), U.S. Fish and Wildlife Service, the State of Arizona and the City of Phoenix, with the majority (38) within the National Forests (Table 2). All monitored nest site locations are recorded in Figure 1.

During 2006, we documented 43 (72%) occupied nest sites from our sample of 60 historic eyries (Table 3). Twenty-five (58%) of the occupied sites were successful, and we observed a total of 45 young ≥ 28 days of age produced from all sites combined. Productivity estimates are 1.05 young per occupied site and 1.8 young per successful site. Three nest sites had evidence of

nestlings present during at least one monitoring session, but later visits failed to detect older young or fledglings. Of these, one eyrie (Cerro Del Fresnal) was easily visible and older young would have been obvious. We assumed this site failed. The remaining 2 sites (Verde Box and Helen's Dome) may have been successful, but the visitation schedule did not provide verification.

Adult peregrines were also detected near 3 other sites (Carr Canyon, Ash Creek, Alamo Lake) during one monitoring session. However, these birds showed no signs of attachment or evidence of residency, as they departed the historic nesting area quickly, and did not return. Later visits did not detect peregrines at these sites, and we concluded the earlier detections were from non-resident birds moving through the area. In addition, we identified six occupied territories from our sample with eyrie locations 500 to 2000m distant from the known, historic sites. In each case, we considered the active sites within the targeted territory, and concluded the new sites were alternate nesting locations, rather than new territories. We recognize some adjacent territories can be in close proximity or may overlap. White et al. (2006) list one instance of nesting pairs within 0.3km. Even so, the absence of additional peregrine pairs in the general area, along with the occupancy history, geographic location and topography, lend support to our "alternate nest site" conclusion.

We also considered that a few territories believed to be un-occupied in 2006, may have been active, but the nest sites were undetected during monitoring and search efforts, due to the obscure location of potential breeding activity. These territories are within very large and complex topographic areas containing many suitable nesting sites. Search efforts needed to investigate most cliff sites in these areas would be outside the scope and funding of the project.

Table 1. 2006 Arizona Randomly Selected Peregrine Falcon Nest Site Distribution and Rate of Occupancy by County.

Arizona County	Total Monitored Nest Sites	Number Occupied	Rate of Occupancy (%)
Mohave	12	7	58
Coconino	10	4	40
Pima	9	7	70
Gila	8	6	75
Yavapai	7	7	100
Graham	3	2	67
Cochise	2	1	50
Greenlee	2	2	100
Maricopa	2	2	100
Pinal	2	2	100
Santa Cruz	2	2	100
La Paz	1	1	100
<i>TOTALS</i>	<i>60</i>	<i>43</i>	<i>72</i>

Table 2. Number of Peregrine Falcon Nest Sites within Land Management Areas.

Agency	Area	Number of Territories
USFS	Coconino National Forest	8
USFS	Apache-Sitgreaves National Forest	2
USFS	Coronado National Forest	14
USFS	Prescott National Forest	4
USFS	Kaibab National Forest	3
USFS	Tonto National Forest	7
BLM	Arizona Strip Field Office	7
BLM	Kingman Field Office	2
BLM	Safford Field Office	1
AZ State Trust	Graham and Yavapai Counties	2
USFWS	Bill Williams Refuge	1
USFWS	Havasu Natl. Wildlife Refuge	1
NPS	Glen Canyon Natl. Rec. Area	1
NPS	Grand Canyon Natl. Park	1
NPS	Lake Mead Natl. Rec. Area	2
NPS	Saguaro Natl. Park	3
City of Phoenix	Maricopa County	1
<i>Total</i>		<i>60</i>

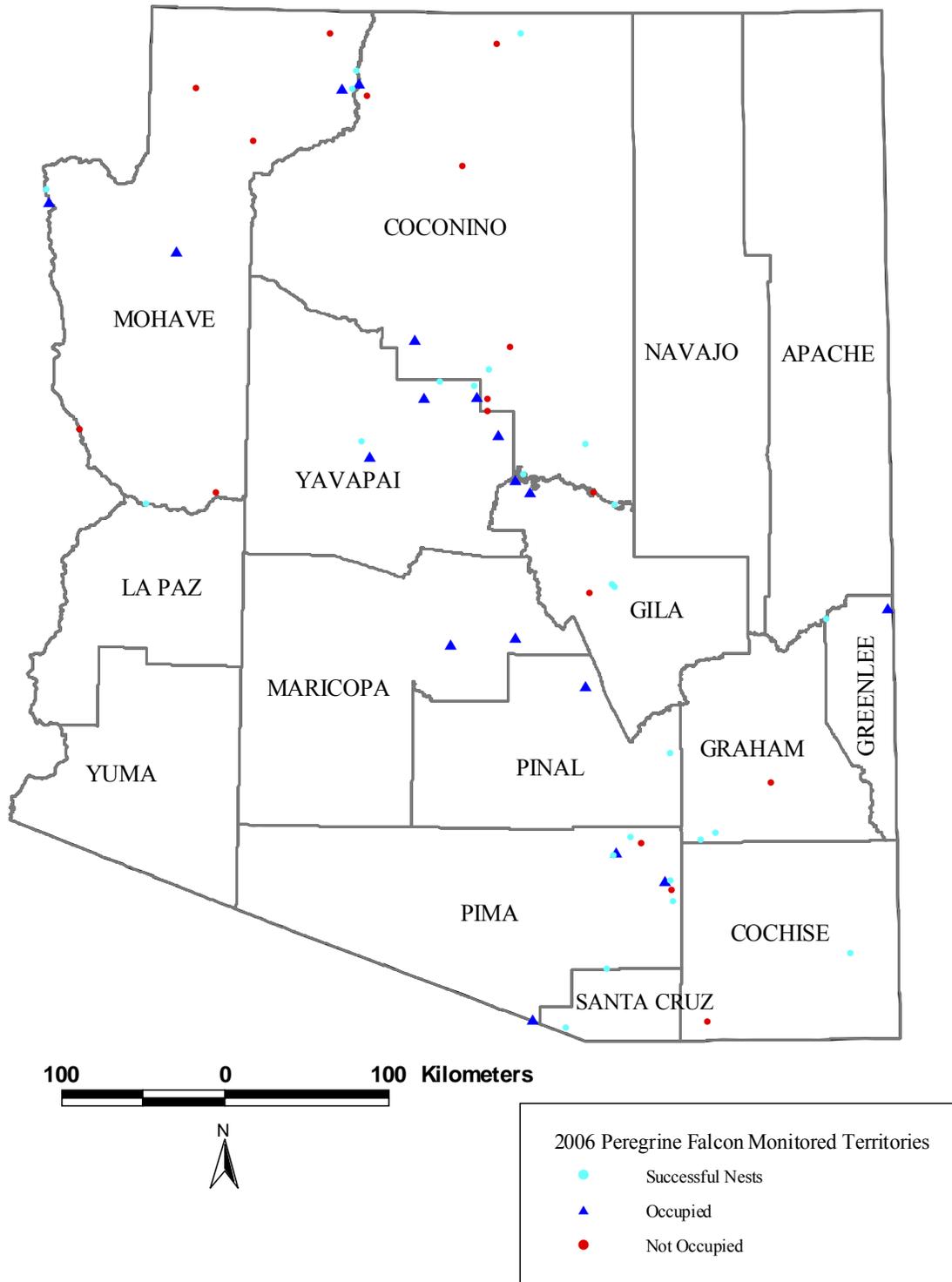


Figure 1. 2006 Peregrine Falcon Monitored Nest Site Locations

Table 3. Peregrine Falcon Nest Site Descriptions and Monitoring Results during the 2006 Breeding Season.

O = occupied, U = unoccupied, UND = undetermined

Territory Name	E.O. Number	AGFD Region	Occupancy Status	Productivity
Kanab / Bullrush Point	2	2	O	0
Confluence Site	3	2	O	2
Parashant	4	2	U	0
Aravaipa Virgus	6	5	O	2
Sycamore Basin	8	2	O	3
Checkmate	12	2	O	3
Bingo	13	2	O	0
Valhalla	14	2	U	0
No See Um	15	2	U	0
Gooseneck	17	2	U	0
Calf Pen Canyon	28	2	O	1
Nash Point	29	2	O	0
Ash Creek	31	5	U	0
Carr Canyon	32	5	U	0
Wrong Canyon	33	5	O	1
Elephant Head	35	5	O	2
Bill Williams Mtn.	36	2	O	0
Center Mountain	38	6	O	1
Milligan / Maness Peak	46	1	O	0
Wet Beaver	49	2	O	0
Bass / Bear Canyon	52	5	O	1
Powell's Monument	61	2	U	0
Redfield Canyon	63	5	O	2
Cape Final	114	2	U	0
Promontory Butte	129	6	U	0
Reef of Rocks (Sea Gods)	130	5	O	1
Cross Current Rapids	134	3	O	0
Helen's Dome	136	5	O	UND
Reef Rock (Rincon Mtns)	137	5	O	3
Happy Valley	138	5	U	0
Pine Canyon	142	6	O	0
Verde Box	143	2	O	UND
Goldstrike Canyon	145	3	O	2
Sycamore Canyon	146	5	O	1
Pumphouse Wash	148	2	O	3
Kanab 16.5 (West of Gunsight Pt.)	150	2	O	1
Granite Mountain	151	3	O	2
Fisher Point	153	2	U	0
Grand Wash Vole	156	3	O	0
Saguaro	158	6	O	0
Hidden Rim	159	2	U	0
Hack / Willow Springs	162	2	O	0
Gobbler Point	165	1	O	1
Al Fulton	167	6	O	2
Mt. Kimball	171	5	O	0
John Long Canyon	172	5	O	2
Mount Bigelow	174	5	U	0
Finger Rock Canyon	180	5	O	3
Nine-mile Draw	184	2	O	2

Table 3.(con't). Peregrine Falcon Nest Site Descriptions and Monitoring Results during the 2006 Breeding Season.

Territory Name	E.O. Number	AGFD Region	Occupancy Status	Productivity
Cold Spring Canyon	190	6	O	1
Bill Williams River	192	4	O	1
Armer Mountain	197	6	U	0
Sunshine Point (Hack Canyon)	199	2	U	0
Alamo Lake	200	3	U	0
Havasu NWR – Needles	201	3	U	0
East Clear Creek	204	2	O	2
Cerro Del Fresnal	208	5	O	UND
Camelback Mountain	211	6	O	0
Thumb Butte	217	3	O	0
Apache Leap	222	6	O	0
<i>Totals</i>	<i>60 sites</i>	<i>6 Regions</i>	<i>43 occupied</i>	<i>45 young</i>

LITERATURE CITED

- Cade, T.J., J.H. Enderson and J. Linthicum. 1996. Guide to Management of Peregrine Falcons at the Eyrie. The Peregrine Fund, Boise Idaho.
- U.S. Fish and Wildlife Service 2003. Monitoring Plan for the American Peregrine Falcon: A Species Recovered Under the Endangered Species Act. U.S. Fish and Wildlife Service, Divisions of Endangered Species and Migratory Birds and State Programs, Pacific Region, Portland OR. 53pp.
- White, C.M., N.J. Clum, T.J.Cade, and W.G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). The Birds of North America Online (A Poole, Ed.). Ithaca: Cornell Laboratory of Ornithology; Retrieved from The Birds of North American Online database: http://bna.birds.cornell.eduBNA/account/Peregrine_Falcon/.

APPENDIX 1: Arizona Game and Fish Department - Peregrine Falcon Occupancy, Nest Success, Productivity Protocol, February 2006.

Adapted from: *Monitoring Plan for the American Peregrine Falcon: A Species Recovered Under the Endangered Species Act (U.S. Fish and Wildlife Service 2003)*

ARIZONA GAME AND FISH DEPARTMENT
 PEREGRINE FALCON OCCUPANCY, NEST SUCCESS, PRODUCTIVITY PROTOCOL
 February 2006

Introduction

The U.S. Fish and Wildlife Service (FWS) is mandated to monitor Peregrine Falcons (PEFA) for no less than five years after delisting in cooperation with States, other agencies and individuals. It has developed the "Post De-listing Monitoring Plan" with the primary objective of detecting declines in territory occupancy, nest success and productivity (indices of population health) throughout the United States. In support of this monitoring plan, and to fulfill the Arizona Game and Fish Department's (Department) commitment to the conservation of this species in Arizona, the Department will conduct monitoring surveys of selected territories (*a random sample of known sites*) based on territory information collected during the 2005 preliminary cliff survey effort. This protocol and the accompanying field data form are adaptations from the FWS protocol and sample form, as well as samples and recommendations submitted by various Department personnel.

Observation Season

PEFA territory observations will be conducted during the breeding season from February to August. In Arizona, there may be some variation in nesting chronology and breeding activity due to differences in elevation, and between different regions of the state. In general, *lower elevations begin breeding earlier and higher elevations are later*. To prevent missing sign of occupancy from early nest failures, every effort should be made to conduct at least one visit during the early breeding (courtship) period (mid-February to mid-April). Earlier observations (prior to incubation) also increase the chances of determining occupancy status, since incubating birds are more secretive.

Recommended Visitation Schedule

Description	Visit 1 Occupancy check	Visit 2 Occupancy check	Visit 3 Success & Productivity check	Visit 4 Success & Productivity check
South Regions and Lower elevations	February 15 th to April 1 st	March 15 th - April 30 th	April 15 th – May 30 th	June 1 st to July 15 th
North Regions and Higher Elevations	March 15 th to April 30 th	April 16 th - May 30 th	May 15 th to June 30 th	July 1 st to Aug 15 th

Monitoring Objectives

Objective 1: Determine Occupancy Status.

The FWS defines an "Occupied Territory" as:

- a territory where either a pair of Peregrines are present (two adults or an adult/sub-adult mixed pair), or

- there is evidence of reproduction (e.g. one adult is observed sitting low in the nest, eggs or young are seen, or food is delivered into eyrie (nest site)).

Your task: *Confirm the presence of a PEFA pair by seeing both birds at the same time, or documenting evidence of reproduction described above.*

Objective 2: Determine Nest Success.

The FWS defines "Nest Success" as: the proportion of occupied territories in a monitoring region in which one or more young ≥ 28 days old is observed. Age is determined by following the guidelines in Cade et. al. (1996).

Your Task: *Confirm the presence of at least 1 nestling (or fledgling if necessary) that is ≥ 28 days old.* You will need to have an observation point looking down into or across from the eyrie. When this is not possible, you may have to time your visit late enough in the season to confirm the presence of older young (e.g., when they begin moving around enough for detection from below).

Objective 3: Determine Productivity.

The FWS defines "Productivity" as the number of young observed at ≥ 28 days old per territory, averaged across a monitoring region.

Your Task: *Confirm the number of young produced and living until the age of 28 days or greater.*

In most cases, determining the number of young will be the most difficult task and may require several visits. It is understood that some young may go undetected and the actual number of young produced at a particular site may be underestimated. Your goal is to count as many young as possible up until the last visit.

Protocol Requirements and Recommendations

Duration, Timing and Number of Observation Sessions

- *Duration* - Observation sessions are to be scheduled in 4-hour blocks. Visits to determine occupancy status, eyrie location, success, or number of young can be shortened, if the observer can confirm the presence of 2 PEFA, evidence of reproduction, or productivity information in less than 4 hours. Be prepared to spend the most time assessing success and productivity. Plan ahead and know your abilities to access the observation area in plenty of time.
- *Time of Day* – All observations need to be scheduled during early morning or evening to maximize detection of PEFA activity. The early morning period is *30 minutes before sunrise to 3.5 to 4 hours post sunrise*. The evening period is *3.5 to 4 hours before sunset to 30 minutes post sunset*. Visibility will be variable depending on your equipment, shade and topography. Use your best judgment in low light conditions when determining exact starting and ending observation times.

- *Number of Sessions* – Experienced observers with detailed knowledge of their assigned territories and a lot of luck, may be able to document all occupancy and reproductive information during a minimum number of visits. Do not depend on this good fortune! Observers should plan a minimum of 3 visits and allow for 4 or more visits in your schedule.

- *Monitoring Session Protocol:*
 - A minimum of two visits must be conducted if occupancy is not confirmed during the first observation session. The first session is completed during the courtship period and when necessary, extended to early incubation. If no evidence of occupancy is found during the first 4-hour visit, a second 4-hour visit is required (see Time between Visits below).
 - Occupied sites will be visited a second time during the estimated early nestling stage to determine the actual age of the nest.
 - A third visit to occupied territories will be made during the late nestling stage (when young are 28 – 42 days of age) to determine nest success and productivity. Additional visits may also be necessary to confirm reproductive information.

- *Remote Sites and Time between Visits:*
 - For remote sites, observers should consider two successive 4-hour sessions, one evening, camping overnight, and then one morning on the following day to make the most efficient use of observer time and energy.
 - When this occurs, complete a separate data form for each 4-hour session. However, this overnight effort will still only be considered 1 visit, since FWS recommends 3 to 4 weeks between visits, and an extended visitation interval will provide a more reliable assessment of occupancy status.
 - Sites with easier access should space observation sessions with 3 to 4 weeks between visits (see visitation schedule above).

- *Occupancy Status and Alternate Nest Sites:*
 - PEFA sometimes have alternate nest sites within the same territory and the pair may be using a location that is several hundred meters away or more. If the known eyrie does not appear to be occupied, the FWS recommends "some realistic survey effort should be expended to try and locate potential alternate nest sites within the territory".
 - This extended search should not be overdone. Monitor all potential sites from your original observation point first. Then expand your search covering logical sites – cracks, ledges, overhangs and holes within approximately 800 meters (0.5 miles). A reasonable search period is 4 hours.
 - Possible alternate sites may include:
 - on the same cliff face, but at a different site
 - on the opposite side of a canyon site
 - on the back side of a rock outcrop

Observation Conditions and Things to Avoid

- Observations should be conducted during favorable weather conditions. Snow, rain, strong winds and fog will influence PEFA activity and your ability to see sign of occupation or reproduction.
- Disturbance of occupied sites during poor weather could influence the outcome of the nesting attempt. Use common sense and check predicted weather conditions prior to departure.
- Avoid flushing incubating PEFA.
- Minimize stress by properly locating your observation point (see below).
- Do not attempt to climb eyrie cliff to collect eggs, feathers or dead young. Please notify Dennis Abbate (Research Branch) (520) 609-2167 regarding possible eggs for collection.

Recommended Observation Equipment

- ✓ quality binoculars
- ✓ spotting scope with tripod
- ✓ GPS unit
- ✓ Data forms and Protocol
- ✓ Field notebook
- ✓ Camera
- ✓ Area topographic maps (*USGS 7.5 minute Quad*)
- ✓ Compass

Equipment Note:

- Subtle signs of occupancy and reproduction can be missed or take longer to detect when using only binoculars. In addition, species verification is essential, and Prairie Falcons or other raptors can sometimes be misidentified when posture, light conditions or brief observations are limiting. A spotting scope will very helpful.
- GPS units leave no doubt about your location and PEFA activity area. Use GPS to identify your observation position and the cliff or eyrie, if conditions permit.
- GPS units should be set to collect locations in UTM's and at NAD 27.

Locating Your Observation Post

- The FWS recommends locating your observation post far enough from the nest "so as not to elicit sustained territorial behavior from either adult". This means you do not want the falcons to be constantly "cacking", patrolling the cliff face, or flying overhead due to your presence.
- The distance range indicated is 150 to 1700 meters. This distance will obviously have a lot of variation from site to site and will depend on local conditions.
- Remember - spotting scopes will permit longer observation distances. You may have to try several locations to find the right position for both the observer and the falcons.

Data Form Completion

- Record all occupancy and nesting observations on the *Peregrine Falcon Occupancy, Nest Success, Productivity Data Form*. One form should be used for each visit.

- Bring the form with you to your monitoring location and complete during your observation session. Do not try to remember important information after you have left the observation post.
- Complete all entries and include sketches, notes, photos and maps when possible. Enter "NA" or draw a line through an entry if information is not available.
- Photocopy forms for your records and send originals to:
 - **Dennis Abbate**
 - **Arizona Game and Fish Department (Region 5)**
 - **555 N. Greaswood Road**
 - **Tucson, Arizona 85745.**
- Check off one or more signs of occupancy and nest success.
- Enter productivity observations.
- Climbing accessibility notes are important when a nest site contains eggs that have not hatched out, or significant eggshell fragments can be retrieved. These will be retrieved by expert technical climbers and used for analysis of contaminants.
- Record notes on general observations and behavior.
- Record directions or access information
- Sketch cliff and eyrie location. Photograph cliff.
- Record additional information in your field notebooks or on the back of forms. If you think it's important or unusual, write it down.

References

- Bayless, M.L., M.F. Ingraldi and K. Signor. 2005. Arizona Peregrine Falcon Statewide Occupancy Survey. Arizona Game and Fish Department, Research Branch, Phoenix, Arizona.
- Brown, D.E. (ed.) 1994. Biotic Communities: Southwestern United States and Northwestern Mexico, University of Utah Press, Salt Lake City, Utah.
- Cade, T. J., J. H. Enders, and J. Linthicum. 1996. Guide to management of Peregrine Falcons at the eyrie. The Peregrine Fund, Boise, Idaho.
- Daw, S, S. Ambrose, M. Beer and M. A. Powell. 2004. American Peregrine Falcon Monitoring Protocol for the Park Units in the Northern Colorado Plateau Network. U. S. Department of the Interior, National Park Service, Inventory and Monitoring Program.
- U. S. Fish and Wildlife Service. 2003. Monitoring Plan for the American Peregrine falcons, A Species Recovered Under the Endangered Species Act. U. S. Fish and Wildlife Service, Divisions of Endangered and Migratory Birds and State Programs, Pacific Region, Portland. OR. 53 pp.
- Ward, L.Z. 1994. Peregrine Falcon Survey Methods. Arizona Game and Fish Department, Nongame Branch, Wildlife Management Division, Phoenix, AZ. 12 pp. plus appendices.

APPENDIX 2: Arizona Game and Fish Department - Peregrine Falcon Occupancy, Nest Success, Productivity Data Form, February 2006.

Adapted from: *Monitoring Plan for the American Peregrine Falcon: A Species Recovered Under the Endangered Species Act (U.S. Fish and Wildlife Service 2003)*

ARIZONA GAME AND FISH DEPARTMENT
 PEREGRINE FALCON OCCUPANCY, NEST SUCCESS, PRODUCTIVITY DATA FORM

Date: _____ 2006 Visit No. _____ (check one): 4-hr. pm _____ 4-hr. am _____
 Location Name: _____ EO #: _____ FWS #: _____ Land Ownership: _____
 Legal & General Description _____

Cliff UTM:(easting): _____ (northing): _____ NAD(circle): 27 83 Zone: _____
 Observation Pt. UTM:(easting) _____ (northing): _____ NAD(circle): 27 83 Zone: _____
 Estimated Distance to nest cliff from Observation Pt. _____ Bearing to cliff: _____
 County: _____ AGFD Region: _____ USGS 7.5'Quad: _____

Observer(s) _____ Affiliation(s) _____
 Observer contact info (phone or e-mail): _____
 Observation Start Time: _____ Observation End Time: _____ Total (min): _____
 Starting Weather: Temp(c): _____ Wind(mph): _____ Cloud Cover (%): _____
 Ending Weather: Temp(c): _____ Wind(mph): _____ Cloud Cover(%): _____
 General Habitat Type (Brown 1994): _____ Elev.(ft) _____

OCCUPANCY STATUS

Possible to view the nest site well enough to see eggs or young? (yes or no) _____.
 No. Eggs observed: _____ No. Young observed: _____
 If unable to see nest site, please explain: _____
 Stage of reproduction at time of visit (courtship, incubation, nestling, fledgling, unknown): _____.

Primary Signs Of Occupancy	✓ Check
• Adult feeding young	
• Young or eggs observed with positive species I.D.	
• Adult in low posture (incubating or brooding)	
• 2 Adults / sub-adults interacting (courtship), perched or in flight	
• Adult prey exchange	
• Adult prey delivery to ledge	

Age, sex & no. of Peregrines present (when known): adult male: _____, adult female: _____
 Adult unknown: _____, subadult male: _____, subadult female: _____, subadult unknown: _____

NEST SUCCESS

Signs Of Nest Success	✓ Check
• Adult feeding young, but young cannot be seen	
• One or more nestlings observed (less than 28 days old)	
• One or more nestlings observed (≥ 28 days old)	

PRODUCTIVITY

Nest Productivity (Young Observed)	Check or Total
• No young detected	
• Number of nestlings observed less than 28 days old	
• Number of nestlings ≥ 28 days observed	
• Total Nestlings Observed	

Date: _____ Location: _____ Observer(s): _____

Climbing Accessibility for Egg Collection

Climbing Information	
• One or more unhatched eggs observed (yes or no).	
• Estimated Cliff Height	
• Estimated Eyrie Height	
• Type of Eyrie (ledge, hole, crack, etc.)	
• Top of cliff accessible for rappel down to eyrie (yes or no)	
• Eyrie only accessible by climbing up from below (yes or no)	

Behavior and General Observation Notes: _____

Directions to Site and Access Information: _____

Sketch of cliff, eyrie location or other details (indicate north and use back if needed):

(check off if completed)

- Attached are 8.5 x 11 map and cliff sketches to this form indicating location, date, and observer.
- Photograph of cliff site (digital photo preferred) is attached or being sent to designated location.

Send Completed Forms to Dennis Abbate, AGFD, 555 N. Greasewood Road, Tucson, Arizona 85745

APPENDIX 3. 2006 Peregrine Falcon Territory Monitoring Data Forms, Associated Maps and Photographic Records. (Digital Format on attached CD)