Standard Operating Procedure (SOP) 5: Conducting the Peregrine Falcon Survey

Protocol for Monitoring American Peregrine Falcons

Central Alaska (CAKN) Inventory and Monitoring Network

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SOP 5 – Conducting the Peregrine Falcon Survey

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SOP 5.0 – Introduction

This SOP gives instructions for conducting peregrine falcon breeding season surveys in the Central Alaska Network (CAKN) units of the NPS. Methods for surveys outlined in this SOP in NPS units are designed to provide more frequent information than those outlined in the nation-wide *Monitoring Plan for the American Peregrine Falcon* (USFWS 2003) (annual versus every three years). The SOP specifically describes the procedure for conducting the survey, collecting data, and filling in both USFWS and NPS data forms (nest cards).

SOP 5.1 – Survey Timing and Logistics

This protocol calls for annual surveys of a contiguous study area containing both known territories and potential habitat. In the CAKN, this index study area is along the upper Yukon River between the Alaska-Yukon Territory border and Circle, AK.

Two to three visits are made to the upper Yukon River study area per year. The first survey is conducted in mid- to late-May to early June during which time all occupied territories are identified. Nest success and productivity are determined during the second survey which is conducted in early to mid- July. Each survey is three weeks in duration. During each survey, all known and potential habitat within the study area is surveyed, and one to three visits may be made to each site in order to obtain required data.

Surveys are completed by boat on the along the Yukon River, launching from Circle or Eagle. Territories are generally surveyed in geographic order; however, territories are sometimes skipped due to logistical constraints (ice bergs, low water, poor visibility due to direct sun, fog or smoke). Therefore, multiple trips are often made up and down the Yukon River to survey all known and potential territories. Campsites are commonly moved each day, with their location dependent on survey progress. Campsites are often chosen near a territory and/or nest with unknown status allowing for observations to be made from camp. Boat gas and miscellaneous food and gear items may be purchased during periodic visits to Eagle and Circle or obtained from the NPS tanks at Slaven's Road House or Eagle.

Generally, two to four observers will work together from a single boat to complete the surveys, however, two crews with two observers each (two boats) may also be used. The benefit in efficiency of using two crews rather than one must be weighed against the increased logistical effort and expense associated with two crews. It is also important to maintain continuity in observers, and this is more difficult with two crews.

A Raptor Observation Record Card (nest card) (Appendix 5.10) should be filled out for each visit to a given territory (one card is used per territory to document all activity for an entire season), and a Raptor Eyrie Record Card, which describes the physical characteristics of the nest territory and specific nest site, (see SOP 4) should be completed once per season, though it may take multiple visits to obtain all information. The Raptor Observation Record Card and Raptor Eyrie Record Card should be printed on opposite sides of the same write-in-the-rain card

to consolidate data for each site. In addition to these data sheets, detailed field notes should be taken in a separate notebook (See Table 5.0).

SOP 5.2 – General Survey Guidelines

To minimize disturbance to nesting peregrine falcons and to standardize survey techniques, terminology and data collection, take note of the following general survey guidelines:

1. Falcons can be active during all daylight hours. Optimal times to survey are likely dictated by both best viewing conditions and expected activity of the birds.
2. Acceptable weather conditions are such that wind, rain, or sun conditions do not interfere with surveyor's ability to see and hear falcons.
3. It is very important to avoid disturbance to nesting peregrine falcons. No loud, explosive devices shall be used to flush perched birds or birds at eyries. Limited playback of common vocalizations is acceptable to elicit a response from territorial birds.
4. Unless nest site visits are specifically needed and authorized, investigators should approach nest sites no closer than is essential to accomplish survey objectives. To avoid egg and nestling mortality or abandonment by adults, disturbances which cause adult birds to leave the nest must be of short duration.

SOP 5.3 – Specific Field Protocol: Surveying Known and Potential Territories

1. Prior to each survey, assemble equipment (SOP 1), including territory location data.
2. Observers approach the potential or known territory from the direction that affords the best possible view of the cliff face. The observation point may move over the course of the visit, but in general should be far enough from the nest to avoid soliciting a sustained territorial behavior from either adult (500-1000 m is recommended).
3. Observers generally stay together so both adults can be observed at the same time. In some cases, observers may observe the territories from different points along extended cliff faces. In Appendix 4 on Field Procedures, Craig and Enderson (2004) provide an excellent discussion of how a pair of observers can work together most efficiently.
5. A minimum of four hours should be spent at each known nest territory unless falcons are present and territory status can be determined sooner. Four hours is normally the maximum time between eyrie visits/exchanges/feedings at the ledge, hence it may take this long to observe activity at the territory. Normally, less time is needed.
6. Observers will stop at areas of potential nesting habitat between known territories and spend a minimum of 4 hours watching for falcon activity. If the area is occupied by peregrine falcons, territory status can sometimes be determined in less than 4 hours.
7. Time should be noted at the start of the observation period, and field notes begun. Pertinent field notes and the visit summary can be recorded on field notebooks, or in part, directly onto the Raptor Observation Record Card. The "REMARKS" section of the Raptor Observation Record Card can be used for any information that helps to support a seasonal summary of the territory, including expanding upon Activity or Behavior noted in the section above it, or describing unique features of the birds. One

Raptor Observation Record Card is intended to contain all the monitoring data needed to describe an active peregrine falcon territory for the whole season, (supplemented by sketches, photographs, or maps if available, which are later attached to the Card). However, in their field notebook, observers may find it useful to make a detailed record of all falcon behavior, as they observe it, in order to be confident about their interpretation of territory. Table 5.0 shows the kind of data that are useful to record both in field notes, or in the "Remarks" section of the Raptor Observation Record Card, as supporting evidence of territory status. Only the notes recorded on the Record Card will be maintained in the database with the season summary for each territory.

Table 5.0 Format and suggestions for typical data collected to monitor nesting peregrine falcons.

FIELD NOTEBOOK	RAPTOR OBSERVATION RECORD CARD
Example: 25 Apr 2000 0800 begin observation 0900 adult (ad) flies into area, wailing and with prey, perches on cliff 0902 ad flies out of cavity, takes prey from other ad, and flies off down canyon (this is the female) out of sight 0904 ♂ad enters cavity 0915 ad ♀ returns to area and flies back into cavity, no prey, ♂exits and flies out of sight *etc…*	"REMARKS" section: • unusual plumage – unique helmet pattern or evidence of subadult age • prey exchange or cache noted • specific type of vocalizations • extreme weather events • interactions with other cliff-nesting species • unusual behavior – courtship or copulation late in the season • band info should be recorded here and on the back of the card

8. Once the status of the territory is determined, or at least 4 hours have passed, observers can move on to the next territory if time allows. However, for new nest ledges, either in

known or newly found territories, observers should do the following (see SOP 4 "Documenting Territory and Nest Site Location):

- Take a photograph (preferably digital with 5-6 megapixel resolution) or make a sketch of the nest ledge
- Mark the location of the nest site on a quad map
- Collect latitude and longitude coordinates using a GPS unit
- Fill in the Raptor Eyrie Record Card (reverse of Raptor Observation Record Card) following instructions attached at the end of this SOP

9. One Raptor Observation Record Card will be completed for each territory visited. Even if no peregrine falcons are detected during a particular visit, this information should be recorded. The USFWS data form and Raptor Observation Record Card and instructions are attached at the end of this SOP.
10. Data sheets are checked at the end of each day for completeness and readability. All information pertinent to the sites sampled that day is recorded. The Project Manager is responsible for the safekeeping and organization of the data sheets, and ensuring that data are entered into the NPS Park unit database (see SOP 7 "Data Management) or that copies are sent to the appropriate state cooperator for the USFWS monitoring program, if appropriate.

SOP 5.4 – References

Cade, T. J., J. H. Enderson, and J. Linthicum. 1996. Guide to management of peregrine falcons at the eyrie. The Peregrine Fund. Boise, ID. 97 pp.

Craig, G.R., and J.H. Enderson. 2004. Peregrine falcon biology and management in Colorado 1973-2001. Colorado Division of Wildlife Technical Publication N. 43, Fort Collins, CO

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. 53 pp.

White, C. M., N. J. Clum, T. J. Cade, and W. G. Hunt. 2002. Peregrine falcon (*Falco peregrinus*). *In* The Birds of North America, Inc. Philadelphia, PA.

Appendix A – Instructions for Completing the Raptor Observation Record Card

Please complete the Observation and Nest Record Card to the fullest extent possible. Attach photographs and maps if available.

Observer:	Full name and address (and agency/institution/business if applicable).
Specific Area:	Give specific description of nest territory and nest site location, reference to a known, local landmark or physical feature.
Map Name/Num.:	Name and/or number of USGS map used for location data.
Nest Terr. Num:	A computer assigned number. Nest territories will be assigned numbers sequentially as they are entered in the database.
Site Number:	Use a letter for different nests or eyries within the territory. Assign letters sequentially as each nest or eyrie is used.
Year:	Year of survey, 4 digits.
Other Number:	Any other number or name an agency or individual has used in the past and may want to use for reference to old reports or data bases.
Latitude/UTM-N:	Decimal degrees or UTM zone-northerly.
Longitude/UTM-E:	Decimal degrees or UTM zone-easterly.
Species:	Common name or AOU 4 letter abbreviation.
Date:	Month-day-year.
Time:	Period spent observing, 24 clock (0700-0930).
Survey Method:	See code on card.
Adults, etc.:	Indicate number observed.
Age of Nestlings:	To the nearest day. Circle actual or estimated.
Number Fledged:	Indicate number that reached 80% or more of fledging age.
Activity:	See code on card (may be more than one).
Season Summary:	Indicate number observed for each category.
Status:	The final status of the territory (see Status/Terminology Definitions).
Remarks:	Add any pertinent information not addressed above. May include a line drawing of area and nest site.

Note: If additional notes are needed, use and attach 5 x 7 sheets with the Card.

Appendix B – Instructions for Completing the Raptor Eyrie Record Card

Tree Nests

Species: Use common name and circle any situation(s) that apply

Tree Height: To nearest meter. Circle estimated or actual.

Tree Diameter: To nearest cm at breast height. Circle estimated or actual.

Height of Nest in Tree: To nearest meter. Circle estimated or actual.

Ground Nests

Ground Nest Situation: Self-explanatory.

Cliff Rock Type: If known: 1. Sedimentary; 2. Igneous; 3. Metamorphic. Include specific formation if known.

Cliff Height: To nearest meter, vertical distance from top of cliff to bottom of cliff. Circle estimated or actual.

Cliff Length: To nearest tenth of kilometer. Circle estimated or actual.

Height of Nest on Cliff: To nearest meter, distance from bottom of cliff to nest site. Circle estimated or actual.

Dominant Habitat Types: Indicate at least 1 and up to 3 major habitat types within 0.5 km of nest site. Also indicate distance (km) to nearest perennial water.

Elevation Above Sea Level: To nearest 20 feet.

Aspect of Slope/Nest: True Direction in degrees, 0 to 360. 00=none (flat).

Nest Condition

For cliff ledges: **Good**: Large well-drained, flat, area, with good (stable) substrate for scrape or stick nest (size is relative to species, a large area would provide nearly fledged nestlings with room to move about and flap without being in danger of falling from ledge).

Fair: Adequate size for species, mostly flat with area for scrape or nest.

Poor (Remnant): Small, sloping, poorly drained;

For stick nests: Good and Fair are both useable nest sites; Poor (Remnant) is not useable.

Overhang: The portion of the nest site used for nesting (scrape and surrounding area) is sheltered from most elements (rain, hail, snow), except for extreme conditions (very windy, etc.).

Accessibility: To ground predators such as foxes or coyotes.

Distance to Human Activity: To nearest tenth of kilometer.

Human Activity Visible from Nest: Self-explanatory.

Types of Human Activity: Closest and most prominent.

Circle Any That Apply: Self-explanatory.

Banding Information: Fill in as appropriate. Banders must complete appropriate BBL data forms/database.

Appendix C – Definition of Terms for Raptor Observations

Alternate Nest
: An unoccupied nest site within the nesting territory of one pair of birds.

Breeding Territory
: The area within which courtship, copulation, nesting and food seeking usually occur.

Eyrie
: The actual ledge on a cliff containing eggs or young used by a pair of raptors during current nesting season.

Fledged Young
: Young that have flown for the first time. For survey purposes, young that have reached 80% or more of their respective fledging age are considered fledged young.

Nest Site
: The actual site of the nest or ledge. More than one nest site may be present within the territory of a pair of birds but used in different years.

Nest Territory
: An area that contains, or historically contained, one or more nests (or scrapes) within the breeding territory of a pair of mated birds, and where no more than one pair has ever bred in any year.

Nestling
: Young of the year between hatching and 80% of fledging age.

Occupied Nest Territory
: A nesting territory where one or two birds showing an affinity for the nesting territory during the breeding season were observed.

Productivity
: The number of nestlings raised to banding age, expressed both as number per total pair and number per successful pair.

Successful Breeding
: Raising at least one nestling to banding age or older.

Unoccupied Nest Territory
: A nesting territory where no bird showing an affinity for the territory during the breeding season was observed (investigators must spend a minimum of 4 hours at the territory during the incubation period to make this determination).

Appendix D – Breeding Status Terminology for Raptor Observations

1. Unoccupied:
   A nesting territory where no bird showing an affinity for the territory during the breeding season was observed (investigators must spend a minimum of 4 hours at the territory during the incubation period to make this determination).

2. Occupancy Unknown:
   A nesting territory where no bird showing an affinity for the territory during the breeding season was observed but investigators spent less than 4 hours at the territory during the incubation period.

3. Occupied--Non-breeding:
   A nesting territory where one or two birds showing an affinity for the nesting territory during the breeding season were observed but no eggs were laid (note: this category requires confirmation that no eggs were laid, therefore only those nests that were frequently observed can be assigned to this category).

4. Occupied--Breeding:
   An occupied nesting territory where eggs were laid (evidence includes young in nest, eggs or eggshells, or adults seen incubating) but where final breeding success was not determined.

5. Occupied--Unsuccessful Breeding:
   An occupied nesting territory where breeding was attempted but where no young reached 80% of its fledging age (for example, eggs destroyed or otherwise lost, eggs failed to hatch, or young hatched but died prior to fledging).

6. Occupied--Successful Breeding:
   An occupied nesting territory where one or more young reached 80% of its fledging age.

7. Occupied--Breeding Status Unknown:
   An occupied nesting territory where breeding or non-breeding could not be determined.

8. Occupied--Breeding Status Unknown, No Young Fledged:
   An occupied nesting territory where breeding or non-breeding could not be determined but it was certain that no young fledged.

Appendix E – Field Data Form-USFWS

Field Data Form – USFWS Peregrine Falcon Monitoring Form

----Return this form to your State or Regional Coordinator ----

Observation Date: (M/D/YR)_____ Nest Site Name or #_____

Which Territory Visit is this? (circle one) 1st 2nd 3rd 4th

Nest Site (circle one): Manmade Natural

Observation Time: Begin_____ End_____
(Should be at least 4 hrs if occupancy, nest age, or nestling number are in question)

Observer(s)_____

Phone:_____
Email:_____Agency/NGO_____

WEATHER: Precipitation_____ Wind (speed estimate)_____

Temperature_____ Cloud cover (%)_____

Note conditions at beginning (beg.) and ending (end) of observation period if different

Observation post: (distance in meters)_____

Approx. Nesting Phase: (determined how?)_____
___
_____
_____

Peregrines present: (define as ad. male, ad. female, ad. unknown, subad. Male, subad. Female, or subad. Unknown, and number of each.)_____
_____

Behaviors observed:_____

Nest observed? Y N Feeding at nest observed? Y N Eggs observed? Y N Unk

How many eggs?_____Young observed (AGE)?_____

How many young?_____ Other Observations:_____

Appendix F – Front and Back Sides of the Raptor Observation/Eyrie Record Card

RAPTOR OBSERVATION CARD (JAN 2006)

OBSERVER NAME AND ADDRESS	TERR./AREA NUMBER	NEST/LEDGE
	LATITUDE/	
	UTM-N	
	LONGITUDE/	
TERRITORY AREA DESCRIPTON	UTM-N	
	DATUM/	
	ZONE	
	TERRITORY NAME / WAYPOINT	

SPECIES (COMMON NAME OR AOU ABBREV.)

DATE	TIME START	TIME END	SUR MET	NO. ADS	NO. SUB	NO. EGG E A	NO. NEST E A	AGE NEST E A	NO. FLG E A	ACTIVITIES
SEASON SUMMARY	TOTAL TIME									STATUS

SURVEY METHOD			ACTIVITY / BEHAVIOR (MAY BE MORE THAN ONE)					
1. FOOT	7. AUDIO		1. PERCHED		7. BODY CARE		13. COPULATE	
2. VEHICLE			2. FLYING		8. COURTSHIP		14. RESPOND TO CALL	
3. BOAT			3. HUNT/FORAGE		9. NEST BUILDING		15. OTHER:	
4. PLANE			4. FEEDING ADULT		10. INCUBATING			
5. HELICOPTER			5. TERR. DEFENSE		11. BROODING			
6. INCIDENTAL OBS.			6. VOCALIZING		12. FEEDING YOUNG			

MAP, NOTES, OR PHOTO ATTACHED? 1. YES 2. NO OTHER?

REMARKS (MOULT, PREY, ETC.) OR SKETCH

RAPTOR NEST CARD (JAN 2007)		TERR.	NEST	YEAR

TREE NEST				CLIFF/GROUND NEST			
TREE SPECIES:				STRUCTURE			
1. LIVE TREE		4. ARTIFICIAL		1. ROCK/CLIFF		3. DIRT SLOPE	
2. SNAG		5. CAVITY TREE		2. INTERMIT. ROCK/VEG		4. VEG. SLOPE	
3. NEST BOX/PLATFORM		6. OTHER		PERCENT ROCK:		5. LEVEL GROUND	
TREE HEIGHT (M)			E A	NEST SITUATION		4. OPEN HILLSIDE	
TREE DIAMETER (DBH)(M)			E A	1. LEDGE ON CLIFF		5. ON GROUND	
HEIGHT OF NEST IN TREE (M)			E A	2. STICKNEST ON CLIFF		6. OTHER	
ELEVATION OF NEST (M)				3. CAVITY/POTHOLE			
ASPECT OF SLOPE (N, NE)				CLIFF HEIGHT (M)			
ASPECT OF NEST (N, NE)				CLIFF LENGTH (M)			
NEST CONDITION				CLIFF HEIGHT ABOVE RIVER/VALLEY (M)			
1. GOOD 2. POOR 3. REMANANT ONLY				HEIGHT OF NEST ON CLIFF (M)			
DOMINANT LAND COVER				NEST ACCESSIBILITY (to ground predators)			
				1. EASY 2. MOD. DIFF. 3. VERY DIFF.			
				OVERHANG AT NEST?	1. YES	2. NO	
DIST. WATER (KM), TYPE				AFTERNOON SHADE?	1. YES	2. NO	
DIST. TO HUMAN ACTIVITY (KM)				HUMAN ACT. VISIBLE?	1. YES	2. NO	

TYPE OF HUMAN ACTIVITY							
1. TRAIL		5. BUILDINGS	9. MINING				
2. ROAD		6. AGRICULTURE	10. OIL AND GAS				
3. BOATING		7. CONSTRUCTION	11. LOGGING				
4. AIRCRAFT		8. RESEARCH	12. OTHER (DESCRIBE):				

CIRCLE ANY THAT APPLY:					
1. PHOTO OF CLIFF			5. FEATHER SAMPLES COLLECTED		
2. PHOTO OF EYRIE			6. BLOOD SAMPLE COLLECTED		
3. EGGS(S) COLLECTED			7. PREY REMAINS COLLECTED		
4. EGG SHELLS COLLECTED			8. OTHER NOTES:		

BANDING DATA

AGE	SEX	FWS/LEG	COLOR/CODE/ORIEN/LEG