Peregrine Falcons and The Washington State Department of Transportation

Marion Carey
Wildlife Biologist
Washington State Department of Transportation
Olympia, WA

Abstract

Recovering populations of threatened and endangered wildlife face increased altercation to natural habitats. Peregrine falcons (*Falco peregrinus*) have demonstrated a strong ability to adapt to urban habitats. This can present a dilemma for agencies with both the responsibility to operate and maintain transportation facilities as well as the need to protect sensitive wildlife. Peregrine falcons have been nesting on an aging steel span bridge in Washington State in both 1996 and 1997, and each year the peregrine's nesting cycle has coincided with the need to complete maintenance and construction work on the bridge. Due to the short, weather driven construction season, not all maintenance activities can be completed outside of their nesting season. The Washington State Department of Transportation (WSDOT) entered into a formal consultation with the United States Fish and Wildlife Service under Section 7 of the Endangered Species Act. As part of this formal consultation, a management plan was developed for the bridge. It identifies three levels of impacts that may result from the various maintenance and construction activities which occur on the bridge. The management plan outlines previously agreed upon conservation and mitigation measures to avoid and minimize impacts. By establishing agreed upon conservation measures and mitigation, the management plan provides a road map to help simplify the consultations between USFWS and WSDOT on this bridge. In addition, it will serve as a model for other bridge sites in Washington which become occupied by peregrine falcons.

Introduction

The main wildlife impacts that are addressed by most state departments of transportation (DOT) involve movement of animals across roadways, habitat loss, and potential construction or operating noise disturbance to threatened and endangered species. As urban areas and development replace and modify many natural habitats, urban-tolerant species are adapting to the point that man-made structures are replacing natural nesting, perching and roosting habitats. While Texas DOT has discovered bats roosting on their bridges, Washington State DOT (WSDOT) has addressed the issues of having gulls and pigeon guillemots nesting on and in piers and other structures at ferry docks, and more recently peregrine falcons nesting on a steel girder bridge. The use of urban structures by urban tolerant wildlife can lead to conflicts between wildlife's nesting needs and construction needs, as has occurred with the peregrines which are nesting on a WSDOT bridge.

Most wildlife species are protected by one or more state or federal regulation. Peregrine falcons are a listed endangered species and fall under the jurisdiction of the Endangered Species Act (ESA) of 1973 as amended. Thus WSDOT addressed it's peregrine/bridge conflict under the auspices of the ESA. Washington is not the only state which has encountered peregrines nesting on bridges; at least eight states have reported peregrines nesting on their bridges. In most cases, monitored bridge sites have lower fledging rates that other urban sites (Frank 1994). We anticipate that with the recovering peregrine population and the attractiveness that urban areas have to peregrines, this situation may become commonplace. We are offering our experiences as one example of how this potential conflict has been successfully addressed.

Peregrine Falcon Life Histories

Peregrines frequent open habitats near water where they can fly and hunt with ease. Nesting normally occurs on the face of steep cliffs, where the birds make a small scrape on a high ledge which lets them look out over their territory (Amaral 1982). Peregrines are wide-ranging hunters which specialize on taking avian species in flight. Normal prey species include rock doves, bandtail pigeons, shorebirds, robins, flickers, jays, swallows, sparrows, starlings and other passerines (Craig 1986).

In the Pacific Northwest, courtship can be initiated anytime from January through the end of March depending on if the birds migrated out of the territory for the winter or spent the winter in their territory. Courtship activities normally last from 6 to 8 weeks (Pagel 1991). Once the nest site has been selected and mating has occurred, up to four or five eggs will be laid. Egg laying can take any where from two to eight days, and incubation will last from 30 to 35 days. Incubation normally occurs in March and April. Once the chicks hatch, they spend from 38 to 54 days in the nest before they fledge. Fledging can take up to 14 days, and then the fledglings can spend from several weeks to months associated with their parents. The fledglings depend upon the parents for food for several weeks as they gain their flying skills (Sherrod 1983).

If the nest attempt fails any time through April, the birds may attempt to recycle. Recycling takes approximately 14 days, and will result in the whole nesting schedule being pushed back. The nesting cycle is outlined in Figure 1.

During the spring and fall when the peregrines are moving between their breeding territories and their wintering grounds, they will follow shorelines where prey species such as shorebirds concentrate. Young birds may accompany their parents during migration. The Washington shoreline, especially the Skagit Flats and Aberdeen areas provides important feeding and wintering habitat for peregrine falcons (Pacific Coast American Peregrine Falcon Recovery Team 1982). They may also winter in urban areas or on their territories. There is one peregrine, nicknamed Freeway, who winters under a highway bridge in Seattle.

Peregrine Falcon Decline

In the 1950's, peregrine populations began to decline and declined to the point that breeding peregrines were extinct in the eastern United States (Pacific Coast American Peregrine Falcon Recovery Team 1982). In Washington, surveys in the late 1950's failed to find any peregrines. The reasons for the declines were examined and the major cause was determined to be DDT and other pesticides which caused eggshell thinning and abnormal behavior of adults (Pacific Coast American Peregrine Falcon Recovery Team 1982). Efforts to reestablish the populations focused on captive breeding and release of captive- reared young. Many of the young which were hacked out at traditional peregrine habitat suffered from severe predation from great horn owls and other predators (Pacific Coast American Peregrine Falcon Recovery Team 1982). In a effort to increase the population and numbers of successfully hacked out

birds, biologists began to look for predator free release sites. Urban areas with their tall buildings and abundant prey populations in the form of pigeons, sparrows and starlings, in addition to their lack of predators, became popular hack sites (Cade and Bird 1990). Urban hack sites helped contribute to the overall population levels of the falcons and increased the number of falcons utilizing urban settings. But not all peregrines found nesting in urban sites are birds that were hacked out in urban sites; some are birds which were hacked out at natural sites or are natural-reared birds (Cade and Bird 1990).

Peregrine Falcon Recovery in Washington State

Management and monitoring of the species in Washington began in 1978 (Allen 1990). Historical information on population levels and eyrie locations is sketchy. In 1980 a minimum of 12 historical sites, located on the outer coast, San Juan Islands and Columbia River Gorge, were documented (Allen 1990). Since 1978 the number of breeding pairs has increased from 1 pair in 1978 to 15 pair in 1990 (Allen 1990). Increased peregrine numbers are attributed to natural recolonization, and reintroduction through hacking conducted in the late 1980's. Currently there are no established hacking stations in the state, and peregrines are no longer being released to augment the current population.

Case History: Lewis and Clark Bridge

The Lewis and Clark bridge, is a 69 year old steel span bridge which spans the Columbia River in city of Longview. The bridge is 5,400 feet long, and is 245 feet tall at it's highest location. It is supported by seven large and numerous small piers, of which four are located within the Columbia River, which is over 3000 feet wide in this area. The bridge requires regular safety inspections and maintenance including replacing rivets, stabilizing cracks, and painting. Many of these activities are temperature and weather sensitive, and must occur during Washington's summer season.

Land use in the immediate vicinity of the bridge includes the port of Longview which has a very active log yard and mill in addition to other industrial use on the northern bank, and the town of Rainier on the southern bank. Wide sandy beaches are present along the southern river banks. These beaches may be underwater during major storm events.

In addition to traffic, railroad and industrial disturbances, there is a large amount of ship traffic in this section of the river, as large ships work their way up and down the river between the Pacific Ocean and the Port at Portland.

The Lewis and Clark bridge connects Washington and Oregon and is jointly owned by both the Washington and Oregon Departments of Transportation. Under the current agreement, Washington is responsible for maintaining the bridge. The peregrine falcon nest site has actually been located on the Oregon side of the bridge for the last two years, but the birds appear to spend most of their time foraging in Washington. Due to the unique location of the Lewis and Clark Bridge and the nest site, jurisdiction of the peregrines is shared by both states. Federal Jurisdiction is also shared between the Washington and Oregon USFWS offices. To date, both the Oregon State Department of Wildlife and the Oregon office of the USFWS have allowed their Washington counterparts to address the situation. We expect that this situation will continue.

Peregrine falcons were first discovered on the bridge by Washington State Department of Fish and Wildlife (WDFW) biologists in 1996, as WSDOT was preparing to complete a summer long maintenance and repair project on the bridge (Leighty 1996). This discovery lead to immediate discussions with the USFWS and the hiring of a falcon monitor. Based on discussions with USFWS, the order of work was scheduled so that work began as far from the nest as possible. The goal was to avoid working in the vicinity of the nest until after the young had fledged. The falcon monitor observed the birds both during the day and occasionally at night, while construction was occurring to determine if the construction activities influenced the birds. Unfortunately, the birds failed in the incubation stage of their reproductive attempt, and did not recycle. Once the nest failure had been confirmed, the project was allowed to proceed without restrictions.

Due to miscommunications and misunderstandings on the part of the WSDOT regional and contract offices, a new maintenance contract was issued for the 1997 construction season without regard for the possibility that peregrines may again be nesting on the bridge. Once the Environmental Affairs Office became aware of the situation, a falcon monitor was hired and a informal consultation was initiated with USFWS.

The first step in determining possible impacts to the pair from the 1997 project was to monitor the peregrines and determine where they were in their nesting chronology. Based on the monitor's observations, it was determined that birds were completing the laying process and were about to initiate incubation. The proposed project activities and timing was compared to the peregrines nesting chronology (Figure 2). Variations in project timing were examined based on the peregrines reproductive status. Due to the length of the project and the temperature and weather dependent nature of the project activities, the project could not avoid intruding into the nesting season. To minimize impacts to the peregrines, a sensitive nest zone with a radius of 600 feet was established using the professional judgment of peregrine authorities. Construction activities were scheduled to occur outside the sensitive nest zone, and the birds were monitored to evaluate the progress of their reproductive activities, and to assess the effects of the construction activities on their behavior.

Even with the adjustment of the construction schedule, work in the sensitive nest zone could not be entirely avoided during the nesting season. There were several finger joints only two hundred feet from the nest site which need to be repaired prior to starting the paving. Therefore, various options, including obtaining an incidental take permit, were considered. After carefully examining the options with both the USFWS and the Washington Department of Fish and Wildlife (WDFW), the selected alternative was to remove the chicks and foster them out to other local peregrine nests. While several contingency plans had been developed to carry out this option, the eggs failed to hatch at the end of the incubation cycle, and the chick fostering option was not needed. While three eggs were recovered from the nest, there was no evidence to indicate that the construction activities contributed to the hatching failure. All construction activities which had occurred prior to the failure of the nest, had occurred well over 800 feet from the nest site. Due to the distance, all construction generated noise was expected to blend in to the ambient noise levels by the time it reached the nest site. During all observations, the pair incubated the eggs normally. To date, however, the eggs have not been evaluated for other possible causes of failure, such as elevated PCB levels or the presence of other pesticides. Eggs collected from other Columbia Gorge sites have shown signs of contamination. Through discussions with the USFWS, the project was allowed to continue without restrictions, after it was determined that the pair was not recycling.

Long Term Planning Solution

The continual need for maintenance and the persistent attraction that peregrines have for the bridge, indicates the potential for yearly conflicts. To avoid revisiting this issue continually with the USFWS on an informal basis, we decided to enter into a formal consultation with USFWS. The intent is to provide all reasonable protection to the peregrines by establishing guidelines for necessary maintenance and construction activities. As part of the formal consultation, we developed a management plan which establishes the protocols to address the peregrines during the necessary construction and maintenance activities. The plan will be in effect for 5 years, but does not address the eventual removal of the bridge.

The purpose of the management plan is to identify all of the potential impacts to the peregrines that may occur from all necessary maintenance and construction activities on the bridge. The plan

outlines the approved timing and conservation methods for the project. The first step was to itemize all anticipated work activities. Maintenance and construction activities covered under the plan include: safety inspections, rivet replacement, expansion and finger joint repair and replacement, replacement of acme panel joint, removal and replacement of existing asphalt overlay, installation and repair of ladders, catwalks and rails, repair of potholes, replacement of concrete bridge deck, pressure washing, sandblasting of corrosion, bridge painting, bridge washing, bridge drain flushing/cleaning, resetting/replacing bearings, repair of cracks, temporary traffic modifications and signing, utility line inspection, and utility line installation and repair.

Many of these activities require the use of noisy equipment such as jack hammers, which will raise noise levels well above ambient levels which are between 77 and 92 dbh depending on the amount of truck traffic. While the peregrines are somewhat acclimated to noise, and the movement of automobiles and trucks across the bridge, they are not acclimated to vehicles stopping or to human activity above or below the bridge deck. Most of the peregrine activity is below the deck. Besides their eyrie, the peregrines have also been observed perching, roosting, hunting and caching food below the deck. They have not been observed using the above-deck areas. Under the management plan, maintenance and construction activities are divided into three categories. Category I projects and activities are those which have minimal impacts on peregrines because they occur, or are rescheduled to occur, outside of the peregrine falcon nesting season. They also include projects which occur during years that there is no peregrine falcon breeding activity on the bridge. Since peregrines may be present on the bridge year round, all projects have the potential to cause minor disturbance to perching or foraging peregrines, but activities which fall in the nesting season are considered to have the greatest potential to impact the peregrines by disrupting nesting.

Category II projects and activities are those which occur during the nesting season, but are not expected to disturb the reproductive success of the birds. These projects either occur outside the sensitive nest zone and do not have any highly disturbing elements such as scaffolding and tarps installed above and or below the bridge deck or they occur inside the sensitive nest zone after the reproductive cycle has been completed. Some of these activities may cause temporary short term changes in food caching and the perching behavior of the birds, but they are not expected to effect the nesting behavior or success.

Category III projects and activities are those which will disturb the birds and disrupt or potentially disrupt their nesting cycle. These are activities which due to the nature of the activity must occur during the nesting season and within the sensitive nest zone while the birds are nesting. Projects which are expected to fall into the Category III designation include bridge deck replacement and bridge painting. These activities will take a long period of time to complete and are temperature and weather sensitive, thus making the avoidance of the nest and nesting season impossible. Some Category III projects may eliminate the reproductive efforts of the peregrines for the year. Specific conservation measures were developed for each level or category of impact.

- For Category I and II projects, the conservation measures were designed to avoid and minimize impacts. These include items such as scheduling work to occur outside the nesting season, observing the bridge to determine if peregrine breeding activities are occurring, locating the nest and delineating a sensitive nest zone, and scheduling work to occur outside the sensitive nest zone. Measures for Category III projects which would potentially impact the reproductive success of the peregrines are based on minimizing lost reproduction and mitigating for the lost reproductive success.

The success of the management plan will depend on how well it is utilized and adhered to. The maintenance of the bridge is the responsibility of several different sections and individuals within WSDOT. Responsible parties include the Utilities Engineer, the Bridge and Structures Office, the Regional Construction and Environmental office, and the Bridge Maintenance Superintendent. All of the above individuals and offices had the opportunity to contribute to and comment on the draft plan. For the management plan to be successful, all of these stakeholders need to be involved in the implementation of the plan. To assist in the implementation, a detailed flow chart outlining the procedures to follow for each project was developed, and a copy of the plan has been provided to each office.

Conclusion

Due to the reoccurring utilization of a large aging steel span bridge by a nesting pair of peregrines, WSDOT entered into a formal consultation with USFWS to allow for the completion of the necessary maintenance and construction activities on the bridge. As part of the formal consultation, a management plan was written which outlines previously agreed upon strategies for avoiding, minimizing and mitigating impacts to nesting peregrines. The plan addresses both the needs of the peregrine and the maintenance needs of the bridge. It not only simplifies the ESA consultations on this bridge, but will serve as a model for other bridges if they become occupied by nesting peregrines as the peregrine population increases.

References Cited

Allen, H. 1991. Status and management of the peregrine falcon in Washington. Pp. 72-74 in Pagel, J.E. (ed). Proceedings; symposium on peregrine falcons in the Pacific Northwest. Rouge River National Forest.

Amaral, M. 1982. Recommended restrictions for protection of peregrine falcons in Alaska - A summary of opinions. In: W.N. Ladd and P.F. Schempf (eds) Proceedings of a symposium and workshop: Raptor management and biology in Alaska and Western Canada. U.S. Fish and Wildlife Service Alaska Regional Office. pp. 217-233.

Cade, T.J. and D.M. Bird. 1990. Peregrine falcons, Falco peregrinus, nesting in an urban environment: a review. Canadian Field -Naturalist 104(2):209-218.

Craig, G. 1986. The peregrine falcon. In: Audubon wildlife report 1986. R.L. DiSilvestro (ed.) National Audubon Society, New York. pp. 807-82

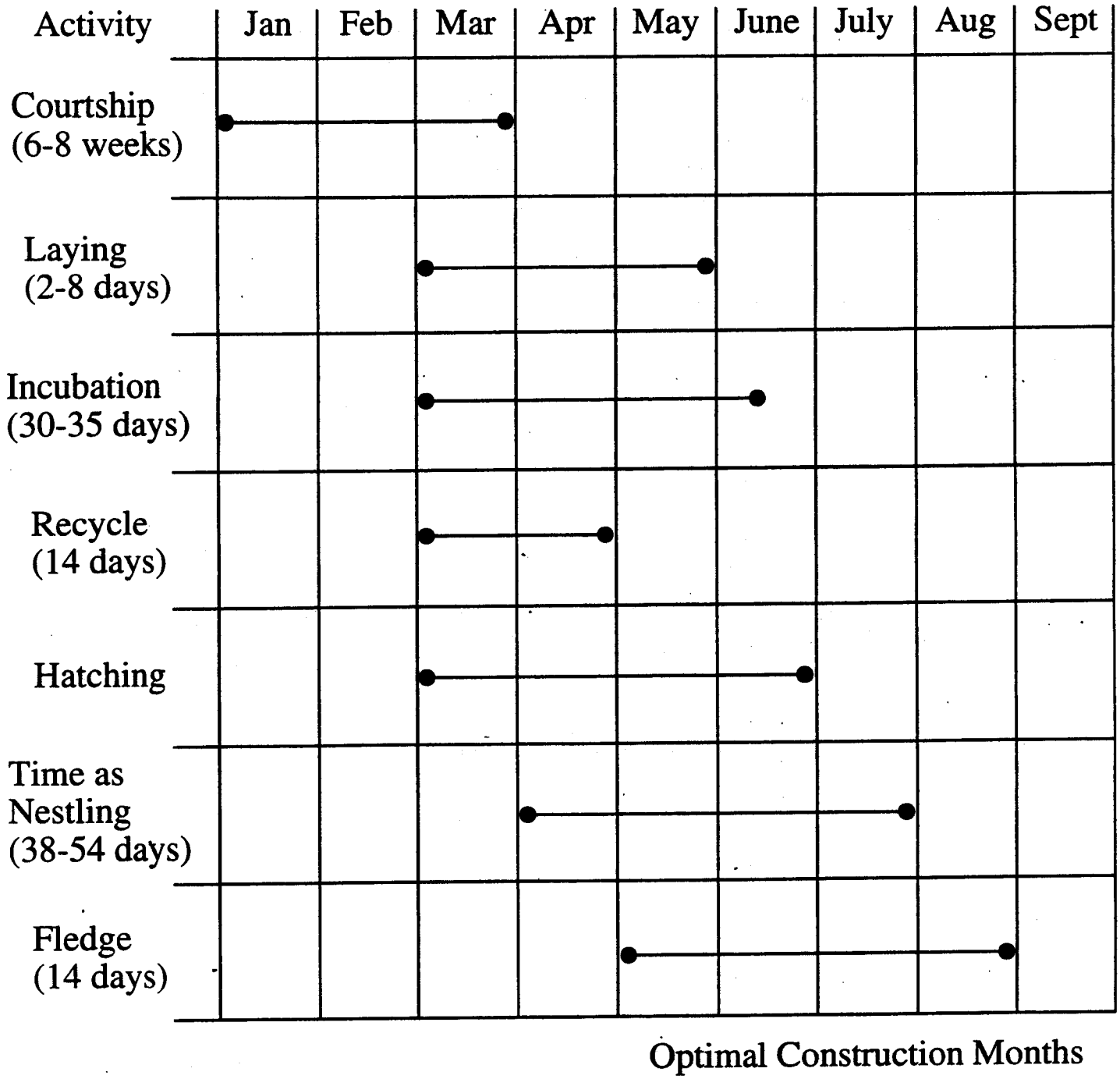
Frank, S. 1994. City Peregrines: a ten-year saga of New York City falcons. 313pp. Surrey, B.C. : Hancock House 1994.

Leighty, R.L. 1996. Peregrine falcon monitoring report: Lewis and Clark Bridge 433/1 Emergent Deck Repair, Cowlitz County. Prepared for WSDOT September 1996.

Pacific Coast American Peregrine Falcon Recovery Team. 1982. Pacific Coast recovery plan for the American peregrine falcon (Falco pregrinus anatum). 86 pp.

Pagel, J. E. 1991. Protocol for observing known and potential peregrine falcon eyries in the Pacific Northwest. pp. 83-96 in Pagel, J.E. (ed). Proceedings; symposium on Peregrine falcons in the Pacific Northwest. Rouge River National Forest.

Sherrod, S.K. 1983. Behavior of fledging peregrines. The Peregrine Fund. Published by Pioneer Impressions, Fort Collins Colorado.



Adapted from protocol for observing known potential peregrine falcon eyries in the Pacific Northwest by Joel E. Pagel, 1992.

Nesting Chronology/Carey

Figure 1
Typical Nesting Chronology of Pacific Northwest Falcons

M	T	W	Th	F	S	S	
14	15	16 Incubation	17 Incubation	18 Incubation	19 Incubation	20 Incubation	April
21 Incubation	22 Incubation	23 Incubation	24 Incubation	25 Incubation	26 Incubation	27 Incubation	
28 Incubation	29 Incubation	30 Incubation	1 Incubation	2 Incubation	3 Incubation	4 Incubation	
5 Incubation	6 Incubation	7 Incubation	8 Incubation	9 Incubation	10 Incubation	11 Incubation	
12 Incubation	13 Incubation	14 Incubation	15 Incubation	16 Incubation	17 Brood (1)	18 Brood (1)	May
19 Brood (1)	20 Brood (1)	21 Brood (1)	22 Brood (1)	23 Brood (1)	24 Brood (1)	25 Brood (1)	
26 Brood (1)	27 Brood (1)	28 Brood (1)	29 Brood (1)	30 Brood (1)	31 Brood (1)	1 Brood (2)	
2 Brood (2)	3 Brood (2)	4 Brood (2)	5 Brood (2)	6 Brood (2)	7 Brood (2)	8 Brood (2)	
9 Brood (2)	10 Brood (2)	11 Brood (2)	12 Brood (2)	13 Brood (2)	14 Brood (2)	15 Brood (2)	June
16 Brood (2)	17 Brood (2)	18 Brood (2)	19 Brood (2)	20 Brood (2)	21 Brood (2)	22 Brood (2)	
23 Brood (2)	24 Brood (2)-39	25 B - F	26 B - F	27 B - F	28 B - F	29 B - F	
30 B - F	1 B - F	2 B - F	3 B - F	4 Brood-49	5 Fledge	6 Fledge	
7 Fledge	8 Fledge	9 Fledge	10 Fledge	11 Fledge	12 Fledge	13 Fledge	July
14 Fledge	15 Fledge	16 Fledge	17 Fledge	18 Fledge	19 Fledge	20	
21	22	23	24	25	26	27	
28	29	30	31	1	2	3	
4	5	6	7	8	9	10	
11	12	13	14	15	16	17	August
18	19	20	21	22	23	24	
25	26	27	28	29	30		

Bird Grid/Carey

Sign installation

Ladder work- above bridge deck

Finger joint work

Paving

Assume - 2 weeks close brooding
2 weeks close feeding
39 - 49 days to fledging

Figure 2

Lewis and Clark Bridge Construction and Peregrine Reproductive Schedule- 1997