National Park Service
U.S. Department of the Interior
Pacific Coast Science and Learning Center
Research Project Summary May 2007

Monitoring Cliff-nesting Raptors at Pinnacles National Monument

The Question: *Are the numbers of nesting pairs of cliff-nesting raptors or the young they produce changing over time at Pinnacles National Monument?*

Pinnacles National Monument was established in 1908 to protect the spectacular rock formations, caves and associated natural features for their scientific value and for public enjoyment. The volcanic cliffs and spires delight many thousands of hikers and rock climbers each year. These rock formations also provide a place for cliff-nesting raptors to raise their young. The three species of cliff-nesting raptors at Pinnacles are Prairie Falcons (*Falco mexicanus*), Peregrine Falcons (*Falco peregrinus*) and Golden Eagles (*Aquila chrysaetos*). Each year approximately a dozen pairs of these raptors nest among the Pinnacles rocks. The majority are prairie falcons. Studies show that Prairie Falcons, Peregrine Falcons and Golden Eagles are highly sensitive to human disturbance, especially during the breeding season. The density of nesting Prairie Falcons at Pinnacles is among the highest known anywhere, even though many climbers and hikers share their cliffs and peaks. This outcome is due to the success of the Breeding Raptor Monitoring Program.



Gavin Emmons





Gavin Emmons

Prairie falcons (top), peregrine falcons (bottom left) and golden eagles (bottom right) are three species of raptors that nest at Pinnacles National Monument.



Gavin Emmons

A raptor biologist posts an advisory sign warning hikers and climbers that raptors are nesting beyond the sign.

The Breeding Raptor Monitoring Program allows cliff-nesting raptors to nest and breed successfully by collecting data to make the best management decisions. Data from this program allow managers to selectively place voluntary closure advisories in areas only when necessary to protect cliff-nesting raptors, leaving open as many areas as possible for public enjoyment. Closing areas only when necessary creates a greater willingness of the public to abide by the temporary seasonal advisories.

The Project: *Visit cliff-nesting raptor territories regularly throughout the breeding season to locate nests and track the status of the nestlings.*

The Santa Cruz Predatory Bird Research Group, under the direction of the Cooperative Park Studies Unit, initially carried out the Pinnacles Breeding Raptor Monitoring Program in 1984 and 1987. Since 1988 the program has been conducted on a yearly basis entirely by National Park Service staff. The program was initiated in response to the perception that visitor use was negatively impacting cliff-nesting raptors. The original intents were to collect data on the timing and success of breeding, to observe the effects of human-raptor interactions, and to discourage human entry into cliff-nesting raptor territories whenever possible.

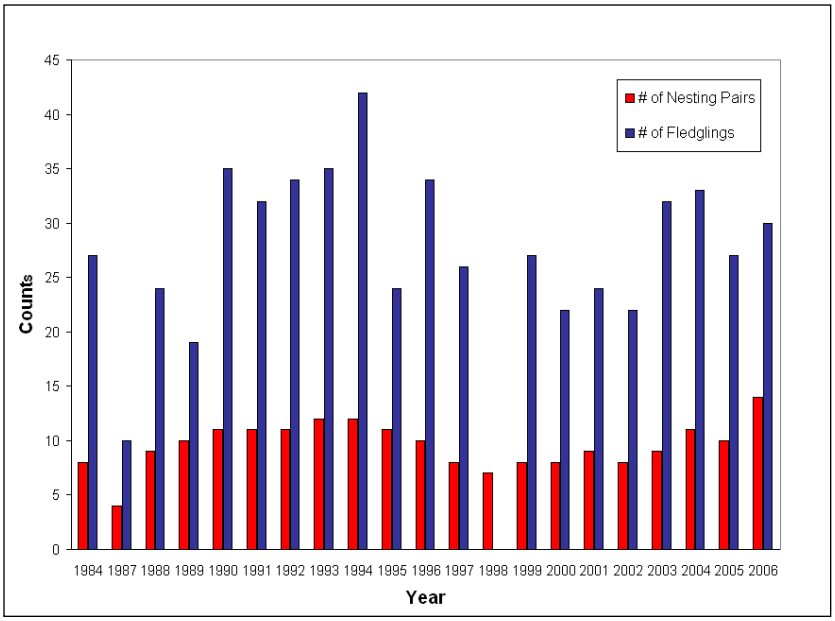
The raptor monitoring season begins in January when advisories are placed on all historic raptor territories. Field biologists visit all known territories on a regular basis as the breeding pairs select nest sites and lay eggs, and the young hatch and eventually fledge. If a territory is not occupied by a certain date, the advisory is lifted. Once all young have left the nests, all advisories are lifted. Data collected during the season include the number and location of occupied nest sites; number of eggs laid, hatched and fledged; and the extent of human entry into occupied territories.

The Results: *Although numbers of Prairie Falcon pairs and young produced vary from year to year, the overall trend appears stable. Additionally, most visitors appear to be complying with advisories.*

Although the park intensely monitors all cliff-nesting raptors, Prairie Falcons are by far the most abundant of these. It is the only raptor species at the park for which we have enough data to evaluate long-term trends.

In 2006, Prairie Falcons appeared to have a fairly normal year at Pinnacles in terms of nests occupied, young produced and the seasonal timing of nesting, hatching and fledging. Looking at the full twenty years of data, the overall trend seems to be one of stability, even though the number of nest sites does fluctuate from year to year.

Falcons did occasionally respond to the presence of hikers on open trails, but these responses were minor. Falcons responded to five off-trail hikers by circling and wailing above their respective territories, but the falcons did not display behavior that threatened nesting success. To their credit, no climbers were observed in advisory areas in 2006.



The numbers of Prairie Falcon nesting pairs and their fledglings have stayed stable over a twenty year period. In 1998, there were no fledglings because no Prairie Falcon eggs hatched.

Although the year was normal for prairie falcons, it was unusual for many other species. It was the second consecutive year in the last 48 in which Peregrine Falcons have successfully nested at Pinnacles. Limited monitoring of tree-nesting raptors also yielded interesting results for three of these species. It was the first time that Long-eared Owls (*Asio otus)* and White-tailed Kites (*Elanus caeruleus*) were observed breeding here, and the first time in two decades that Turkey Vulture (*Cathartes aura*) reproduction was seen. Overall, a dozen breeding raptor species were recorded, many of them in new nest sites.

Additional Resources:

Pinnacles National Monument "Raptor Page"
http://www.nps.gov/pinn/naturescience/raptors.htm

For More Information:

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The Pacific Coast Science and Learning Center is one of 17 centers across the country working to increase the effectiveness and communication of research and science results in the national parks by facilitating the use of parks for scientific inquiry, supporting science-informed decision making, communicating relevance and providing access to research knowledge, and promoting resource stewardship through partnerships.