

Revival of Zuni Eagle Husbandry in a Modern Context

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Since 1940, Native Americans have been required to apply to the United States Fish and Wildlife Service (USFWS) to obtain eagle carcasses or other parts. An increase in tribal populations and a revitalization of cultural practices has increased the demand for eagle parts and led to delays in filling requests. In a cooperative effort with the USFWS, the Pueblo of Zuni Indian Tribe recently revived the ancient Zuni practice of live eagle husbandry in order to both maintain this cultural practice and make eagle feathers more widely available to tribal members. This is being accomplished in a manner consistent with modern raptor husbandry techniques, but in a Zuni-based context. Environmental professionals have assisted the project greatly, especially concerning the life history and behavioral needs of the birds and the implications for eagle conservation. Although we have explored and decided against the idea of breeding captive eagles so that their young may be released into the wild (because it goes against traditional Zuni beliefs), this is certainly a feasible option for other, similar facilities and would be strongly supported by the USFWS, conservation groups, and wildlife professionals.

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It is likely that most people have seen Native American religious and ceremonial dress or photographs or drawings of these. Much of this attire makes use of various animal parts, including eagle feathers. The process by which Native Americans obtain eagle feathers for ceremonial use—including dance garments and religious offerings—is relatively obscure, however. It is an often long and complicated process, and it has become increasingly difficult in recent years for many Native Americans to meet their religious obligations.

Although the 554 federally recognized Native American tribes in North America are diverse and encompass a broad range of lifestyles and cultures, some broad generalizations can be made about how tribes have made use of animal parts. For thousands of years, Native Americans gathered many animals for subsistence living and sustenance of their cultures. Each animal had its place in a particular culture. Naturally, certain tribes had a particularly meaningful relationship with certain animals, such as the Great Plains tribes and the bison (*Bison bison*), or the tribes of the Pacific Northwest and the salmon (*Oncorhynchus* spp.). Nearly all tribes, however, held the eagle in special reverence (Tyler, 1979). After the relatively geographically limited California condor, eagles are the largest raptor in North America, so this respect was not surprising. Cultural practices with regard to eagles differed widely, but many tribes actively captured live adult eagles or took chicks from nests.

Zunis have a long history of eagle husbandry. The earliest Western explorers, from Coronado in 1539 (Castaneda, 1990) through Cushing (1893), reported seeing live eagles tethered or otherwise kept at the Pueblo of Zuni (Bunzel, 1932; Ferguson and Hart, 1985; Wheeler, 1872). Edmund Hillers, accompanying John Wesley Powell through Zuni in 1879 (Phoebe A. Hearst Museum of Anthropology, 2002), photographed several eagles either in cages or tethered above them in several places around the village of Zuni (Figure 1) and outlying settlements. Many older Zunis remember a time when a relative or neighbor kept a live eagle. For Zunis, the care of eagles was an enormous responsibility, and a variety of religious ceremonies surrounded the handling and care of the birds.

Before the passage of the Bald Eagle Protection Act in 1940, Native Americans were free to collect eagles and eagle feathers from the wild for religious and ceremonial use (the Act was amended in 1962 to protect golden eagles as well). This law, while providing much needed protection for these

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Figure 1. Historical photo of a Zuni man and his eagle, taken in 1879 by Edmund Hillers. The modern facility incorporates some of the elements shown here, including the use of adobe, stone, and stick latillas. (Source: A:Shiwi/A:wan Museum, Zuni, New Mexico. Used by permission of the Smithsonian Institution.)

species, also had a chilling effect on Native American religious ceremonies by prohibiting the take and possession of eagles. The passage of other laws, including the Migratory Bird Treaty Act in 1936 and the Endangered Species Act in 1973, strengthened this prohibition. Although some of these laws made exceptions for Native American use of eagle parts for religious purposes, the conflict over use of eagle parts has a complicated history that has reached as high as the United States Supreme Court (Albert, 2002).

The National Eagle Repository was established in 1974 as a means of providing Native Americans with eagle feathers and other parts. Located in Commerce City, Colorado, the Repository receives all eagles that die and are recovered within the United States and sends them out, mostly to Native American tribal members. The facility sends out approximately 1,200 whole eagles per year, along with hundreds of other parts (United States Fish and Wildlife Service, 2000). While this facility does an excellent job of supplying feathers and parts to many Native Americans, there are not enough eagles to meet the demand of every tribal member who needs one. The waiting period for a whole eagle has grown steadily over the past decade, and is now approximately three and a half years, with the wait for a juvenile golden eagle (one of the most desired types) nearly four years (Wiist, 2001).

In this article, we describe a method of eagle husbandry at Zuni that is helping to meet the tribal need for feathers.

The project broke new ground in several areas of administration and federal-tribal cooperation. It was the first project of its kind, and the facility has become the first Native American raptor center. The most novel aspects of the project are the incorporation of ancient traditions with modern husbandry of a federally protected species, the unique administrative steps we took to insure the project met federal guidelines and stayed within the law, and the unique educational programs that we have developed. In addition, the project and others like it may help wild populations. Although we have explored and decided not to pursue the implementation of captive breeding, rearing, and release of eagles into the wild (mainly for Zuni cultural reasons, some of which are proprietary information), we believe this aspect of the project is entirely feasible and would be relatively easy to implement. We hope that other tribes that develop projects such as this would implement such a plan. We also hope it is of interest to tribal resource managers and federal wildlife administrators that regularly work with Native American tribes.

Need for Feathers at Zuni

Zuni is the largest of the 19 New Mexico Indian Pueblos, both in area and in population. The Zuni Reservation encompasses nearly 300,000 hectares (more than 3,000 square kilometers) of canyons, mesas, rangelands, and wetlands in western New Mexico and eastern Arizona (Figure 2). Perhaps because of this remoteness, it has also remained one of the most traditional Native American tribes in North America. The Zuni language is the primary language spoken in most home and social situations, and the vast majority of people still practice the Zuni religion.

Because of the large number of Native American tribes in the Southwest (there are 78 federally recognized tribes in Oklahoma, New Mexico, and Arizona), most requests to the Repository come from this region. In fiscal year 2000, 561 of 1,488 (38%) orders for whole eagles or eagle parts came from Region 2 (one of 7 regions), which encompasses Arizona, New Mexico, Texas, and Oklahoma (United States Fish and Wildlife Service, 2000).

The need for eagle feathers at Zuni is particularly acute. In recent years, as many as 7% of the requests to the Repository from Region 2 have come from Zuni. Part of the reason for this is that Zuni tribal members use feathers in unique ways, such as offerings in which the feathers cannot be re-used. With several thousand tribal members religiously active, the need for offering feathers can be

extensive. It should be noted that many of the feathers used in offerings are not wing and tail feathers (flight feathers), but the more numerous body (or contour) feathers.

Initial Contacts with the Bureau of Indian Affairs and the United States Fish and Wildlife Service

In a 1995 meeting between one of the authors and the United States Fish and Wildlife Service (USFWS) on other matters, the issue of eagles was raised. The author was aware of Zuni's history of eagle husbandry and wondered if such a practice might be re-instituted to at least partially meet Zuni's need for feathers while at the same time reviving an ancient tradition. A meeting was set up with officials of USFWS to discuss what avenues the tribe might pursue. The USFWS outlined three options:

1. Collecting a nestling and raising it. This option had the advantages of being in harmony with the traditional Zuni method of eagle collection and, if there were any nests on Zuni land, it would be a relatively straightforward procedure to get the permit. In addition, fratricide (killing of one offspring by another) is frequent among young birds of prey, including golden eagles (Kochert et al., 2002). This is presumably an adaptive response to times when food may be limited, to insure survival of at least one nestling, usually the strongest. Thus, removing one chick from a nest might have relatively minimal recruitment consequences on wild populations. At the time of the meeting, however, there were no known active nests on Zuni land (Zuni Fish and Wildlife Department, 2002), and we began to explore the process of obtaining both a federal permit and land owner permission for looking at eagle nests off Zuni land, in conjunction with the options outlined below.
2. Applying *en masse* to the Repository and redistributing feathers slowly among tribal members. This would entail enlisting tribal members to apply through the normal process to the National Eagle Repository. Once a tribal member received a bird, (s)he would donate it to the tribe for redistribution of the feathers, a procedure that would allow more tribal members access to feathers, while admittedly diminishing the number of feathers available to the original recipient of the bird. Although we looked into this possibility, we suspected that anyone who waited three to four years for his or her eagle would be hesitant to part with it.

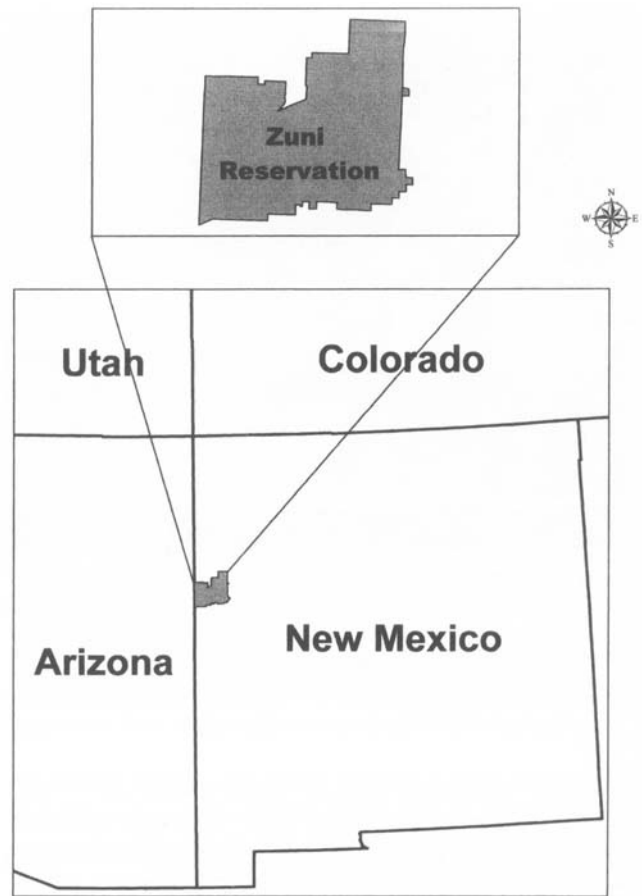


Figure 2. Zuni Reservation lands in New Mexico. The Zuni tribe also owns land in Arizona (not shown for privacy reasons).

3. Constructing an eagle sanctuary. One interesting fact that came out of the meeting with USFWS was that there are great numbers of nonreleasable eagles in need of permanent placement at suitable facilities. Each year in the United States, hundreds of eagles are injured and killed from collisions with cars and power lines, electrocution from power lines or transformers, or being illegally shot. Nearly all of the zoos that have the capacity to take such birds are full, as are rehabilitation and education centers. (Wild release of eagles, usually the preferred option for birds capable of survival, is not just a matter of setting them out in the wilderness. "Hacking," or training birds to hunt and live on their own, is a complicated, time-consuming, and often expensive procedure.) If constructed, a facility could be stocked with these nonreleasable birds. The main drawback to this option was the cost. We estimated that it would take at least \$50,000 to construct an appropriate facility.

As we explored all three options simultaneously, it soon became apparent that a captive facility was the most feasible option. It would be relatively easy to get many birds and it would not have any impact on wild eagle populations. Such a facility would save the lives of many eagles that would otherwise be euthanized if appropriate facilities could not be found.

Steps Toward the Captive Facility

Although the Zuni people had centuries of experience in handling eagles, current laws and other social paradigms mandated that we take a more modern approach to raptor husbandry. This approach of melding traditional and modern has become a hallmark of our approach to resource management at Zuni. Some of our sources of information are described below.

Printed Material

The first step in developing the sanctuary was to determine exactly what was needed to safely and humanely handle, feed, and care for a number of birds. We gathered as much extant literature as we could on raptor care and management (e.g., Arent and Martell, 1996; Beebe, 1992; Johnsgard, 1990; Kochert et al., 2002; Noll-Ueblacker, undated).

Site Visits

We visited other facilities that cared for eagles, both long term and short term, including the Wildlife Center in Espanola, New Mexico; the Birds of Prey Foundation in Broomfield, Colorado; the Los Angeles Zoo; and the Rio Grande Zoo in Albuquerque, New Mexico. While each of these locations housed eagles and other birds of prey in very different ways, it soon became clear that the similarities in care were greater than the differences.

Enlisting the Support of Regional and National Organizations

Within the first few months of the project, we joined the American Zoo and Aquarium Association because we realized that this organization provided ready access to raptor husbandry experts and a forum (via publications and meetings) to get out our message about the need for eagles, and to keep up with the latest developments in the field of raptor care. Dr. Michael Hutchins, Director of Conservation Science, and Dr. Michael Wallace of the Los Angeles Zoo were helpful and supportive in the initial stages of the project. They offered advice and assistance

with the technical design of the facility. We have since had helpful contact with other organizations, such as the American Association of Avian Trainers and Educators. Once we knew the type of facility we needed, we began to search for funding. With the assistance of a visiting university student, we researched public and private foundations, wrote several grants, and were pleased to receive quick affirmative responses from five private foundations, totaling \$52,000.

Initially, we explored the possibility of breeding eagles in captivity. It was thought that in this way, birds that were removed from the wild could contribute to restoring wild eagle populations and the circle would be completed. After careful consultation with religious leaders, however, it was decided for cultural reasons to not pursue the idea. Other, similar facilities could play a vital role in breeding birds for wild release, however: it would take relatively little additional space and infrastructure, the birds breed readily in captivity (Cesere, 1999), and the idea would be supported by USFWS, conservation groups, and wildlife professionals. Even if not actively sending birds back into the wild, this facility and others may assist wild populations by taking the pressure off rehabilitation facilities that are already full of nonreleasable birds, so they can turn greater attention to potentially releasable birds.

Facility Design and Construction

After visiting several captive raptor facilities, we were fairly cognizant of the physical aspects needed in the facility. The Code of Federal Regulations for falconry (50 CFR 21.29, which may not necessarily apply to permanently disabled birds) describes the minimum requirements for housing captive birds of prey. In addition to providing for the physical needs of the birds, however, we wanted to create an aesthetically appealing structure that would greatly exceed the minimum needs of the birds and that would fit with the surroundings.

Two architects played a key role in completing this step. Donna Cohen and Claude Armstrong were immediately enthusiastic about the project and agreed to design the facility for only the cost of supplies. We sent descriptions of the features we liked, literature on the design of other facilities, and photographs of the Zuni area to the architects, and they began to design the facility, completing conceptual sketches, rough sketches, and the final blueprints and scale model of the planned facility.

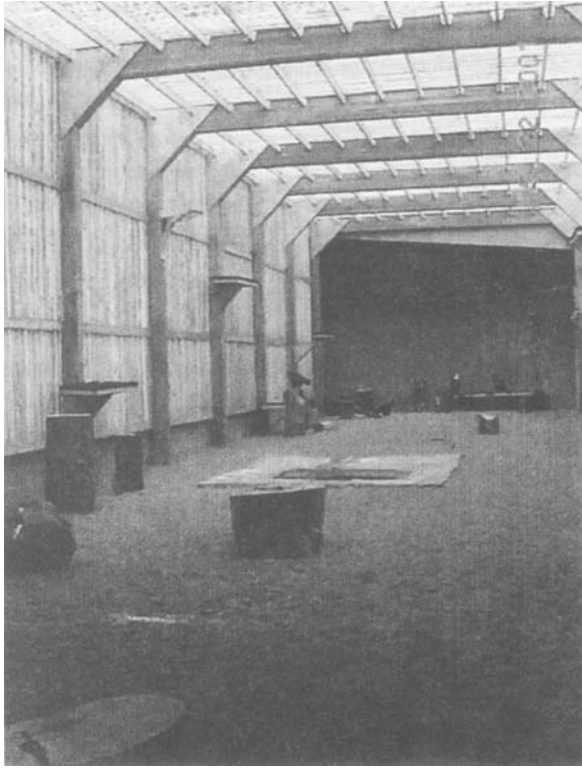


Figure 3. The inside of the flight cage, Zuni eagle sanctuary, showing the main flight area. The smaller cages for flightless birds are to the right. The variety of perches for birds of different flight capabilities is evident on the left.

The Completed Sanctuary

The basic structure (Figures 3 and 4) is composed of vertically oriented 2" × 2" lumber to allow exposure to sun, wind, rain, and other weather which the birds seem to enjoy. It has one 31 × 7.7 × 5.5 m (high) flight area and four 6.2 × 4.6 × 2.4 m (high) areas for flightless birds. The facades on the east and west ends are made from locally quarried Zuni sandstone, and the lumber on the ends is from sustainably harvested trees (mistletoe diseased trees thinned to promote forest health) that were milled at the Zuni Community Sawmill. The substrate is river-washed pea gravel, and all the cages have shelter where the birds can escape the elements. The front of the facility faces south toward one of Zuni's sacred mesas and a location over which golden eagles are occasionally sighted. Other functional features include water dishes in each of the cages and a wide variety of perches for the birds (foot infections are perhaps the primary cause of ill health in captive raptors). Most of the perches are covered with Monsanto Astro-turf® brand synthetic carpet, which minimizes wear on the feet, strengthens and cleans them, and keeps them elevated from dirty or fecal-covered



Figure 4. The Zuni eagle sanctuary from the west side, showing details of hand-worked native sandstone, stick latillas on the door, and lumber milled from the Zuni sawmill. The overall architecture incorporates the "blocky" multi-layered construction found in Zuni and other New Mexico Pueblos.

surfaces. Many of the smallest details, such as doors and perches, are works of art created by the Zuni craftsmen who worked on the project. In November 1999, the American Institute of Architecture recognized the facility with a special award for design excellence.

Other Elements

Education

In addition to their roles as providers of feathers and spiritual inspiration, the eagles themselves are a fascination for adults and young members of the local area, both Zuni and non-Zuni. We have developed a full-scale educational system, featuring hands-on programs in which people can carefully handle eagle feathers and, for Zuni youngsters, stories in the Zuni language. The highlight of the educational program is our imprinted and glove-trained golden eagle female, O:lo ("golden" in the Zuni language) (Figure 5), a partial-wing amputee. This bird has a docile personality and we have trained her to participate in on-site and classroom visits. More than 2,500 people had the chance to meet O:lo last year, either in their classrooms or at the sanctuary. In controlled situations, the bird is also tolerant of limited touching and stroking, an act which can be a spiritual experience for many Native Americans.

Mentoring

We recently established a partnership with the Zuni Senior Center and are planning to have Zuni elders come to



Figure 5. The Zuni eagle sanctuary's "educational bird," O:lo, who is taken to classrooms. O:lo is an adult female golden eagle whose right wing was partially amputated after a broken bone became infected. She was trained by the sanctuary staff to tolerate and even enjoy the presence of and contact with humans.

interact with youth and share stories and customs about eagles. The elders will provide an excellent link between the modern facility and lessons about ecology, and the ancient practices and customs associated with eagle care.

Partnerships

In addition to the concrete benefits provided by the facility itself, the program has strengthened our ties with the local community and surrounding agencies. No fewer than 25 organizations have participated in either funding or supporting the project, including the USFWS, the National Park Service, the Bureau of Indian Affairs, and dozens of local and national non-governmental foundations and organizations.

Training in Raptor Care

The Zuni Fish and Wildlife Department handles all the daily care needs of the birds, such as feeding and basic health care, and our staff has become trained in many aspects of raptor medicine and basic care. With generous assistance (via training) from Dr. Ned Gertz and the Rio

Grande Zoo in Albuquerque and the New Mexico Wildlife Center in Espanola, New Mexico, we now provide much of the physical treatment for the birds ourselves. We can thus diagnose health problems early on. We have also trained ten Zuni high school work-study students in aspects of raptor care; the birds are free-flying, and the students take an active role in their feeding. The birds are fed a varied diet consisting generally of lab or farm raised rats or quail, Birds of Prey Diet® (horse meat, corn, and vitamins), and fresh roadkill. The whole animals (rats and quail) are particularly nutritious because the birds eat the entire animal, including organs and bones; this also minimizes our cleanup time. The diet is supplemented with Vita-Hawk® vitamin powder.

Feather Harvesting

The facility is serving its intended purpose well, providing literally thousands of feathers per year for Zuni religious and cultural leaders. These feathers are distributed in a manner developed by the Zuni Tribal Council. One aspect of the project that surprised us mildly in a less than positive way, however, was the number of feathers shed annually by the birds. Before thoroughly researching this information, we assumed that eagles, like most other birds, would undergo a complete molt once a year (Terres, 1995); however, Kochert et al. (2002) indicate that adult birds require 2–3 years to replace a complete set of feathers, and this is consistent with our observations.

Conclusions: The Future of the Zuni Eagle Sanctuary and Recommendations

The sanctuary has been such a success that the tribe is exploring ways in which it can expand the project, and we have already developed plans for a physical expansion with additional flight and holding cages. Elements that have been particularly successful include the educational and tourism aspects; however, the Pueblo of Zuni, like many rural or Native American communities, is ambivalent about tourism and the lost privacy that this often entails. Although we do not turn away visitors when someone is available to show the facility, we do not openly encourage visitation. Some community members have expressed concern that turning the facility into a tourist destination would detract from the original purpose of the sanctuary, i.e., the deeply religious aspects of caring for eagles. While we do not charge money for entry into the facility, this could be done in other situations to offset the cost of operations and maintenance.

From an administrative standpoint, one of the biggest lessons we learned was that innovative projects such as these—especially those that need to run in or through a bureaucracy or federal agency—are most successful when the individuals in key decision-making positions are supportive. We are deeply grateful to the staff of Region 2 of the USFWS (again, particularly the individuals that approved this project) for their support; however, we believe we were able to foster that support with an open, honest, and forthright approach, many face-to-face meetings, and a respect for *their* position as overseers of endangered wildlife.

There are literally dozens of eagles that need permanent homes every year. Before the start of this project, we had no special training in eagle husbandry, other than what was practiced traditionally. The cost was relatively minor, and the facility continues to operate safely every day. Given the vast number of tribes that are in near-constant need of eagle feathers, this facility could serve as a model for other Native American communities. These facilities have the potential to directly and indirectly aid in the recovery of eagle populations at the same time as they provide much-needed feathers for religious and cultural purposes.

Acknowledgments

This completion of this project was a long complicated process that involved the commitment, support, and energy from literally hundreds of people. We especially want to thank the current and previous Pueblo of Zuni Governor and Tribal Council, the Zuni Heritage and Historic Preservation Office, Nancy Kauffman and Lynn Starnes of the United States Fish and Wildlife Service, Hilary Jones, the Fund of the Four Directions, the Christopher Reynolds Foundation, the Chamiza Foundation, the Angelica Foundation, and the Lannan Foundation. We also wish to thank (in alphabetical order): Claude Armstrong; the Audubon Birds of Prey Center; the Bird Treatment and Learning Center in Anchorage, Alaska; and Danny Booqua, Al Cesere, Andres Cheama, Albert Chopito, Donna Cohen, Reese Collins, Sam Crowe, Waldo Davis, Dewey Deysee, Darrell Dutukewa, James Enote, Diana Flynt, B.J. Golec, Michael Hackett, Michael Hutchins, Jerome Kallestewa, Shirley and Jack Kendall, Kenny Kessler, Cordell Lasiloo, Sharon Lieber, Ernie Mackel, Kamille McKeever, the Nashville Zoo at Grasmere, the National Foundation to Protect America's Eagles, Julius Othole, Loren Panteah, Melissa Peyketewa, Dr. Kathleen Ramsay, Alex Seowtewa, Octavius Seowtewa, Frank Shoemaker, Perry Tsadiasi, Sigrid Ueblacker, Christy Van Cleve, Clifford Waikanewa, Michael Wallace, the Wildlife Center, Gabriel Yuselew, Pablo Zamora, the Zuni Conservation Project, the Zuni Housing Authority (including the late Roy Flack), and the Zuni Rental Enterprise. We apologize for any omissions.

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