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Osprey Summer: Ospreys Nesting on Flaming Gorge

Ron Stewart
Utah State University

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Final document on the preparation of the Master's Project:

OSPREY SUMMER:
Ospreys Nesting on Flaming Gorge

Prepared by: Ron Stewart

December 3, 1991

Prepared for Masters Committee:

Nelson Wadsworth _____
Committee Chairman - Department of Communications

Penny Byrne _____
Committee Member - Department of Communications

Gar Workman _____
Committee Member - Department of Natural Resources

Introduction

The osprey, sometimes known as the "fish hawk" is one of Utah's rare and unique raptors. The osprey's diet is almost exclusively fish. Considering the osprey has evolved both physically and behaviorally to catch fish, their distribution is quite limited in a state as dry as Utah. Most ospreys only pass through Utah on their northern or southern migration but a few stop, build nests, hatch and raise their young.

The osprey population in Utah is actually increasing. Unlike most wildlife, man's ability to alter his environment has improved some habitat for osprey in the form of reservoirs. Utah's largest colony is found at Flaming Gorge Reservoir. Before the dam was constructed, the Green River was a muddy, turbulent river offering little habitat for the osprey. The dam created a deep reservoir but the clear water enables the osprey to see its prey. Rocky pinnacles lining the shore of the reservoir provide excellent nesting sites Fish in the reservoir and in the Green River supply an ample prey base.

The Flaming Gorge osprey population is unique because presently, they nest exclusively on the rocky pinnacles and cliff ledges adjacent to the reservoir. Although nest sites on pinnacles and man-made objects are well known, ospreys more commonly nest in trees.

History

Early sightings of ospreys in Utah were widely scattered. Personal recollections of local residents and people working in the area and data recorded after the construction of Flaming Gorge dam indicate ospreys nested in small numbers in the Uinta Mountains. One or two nests probably existed in the Horseshoe and Kingfisher canyon area of Flaming Gorge prior to the reservoir. Biologists studying the fisheries and wildlife in the Uinta Mountains in the 1950's remember seeing nesting ospreys at many of the high mountain lakes. However recent fisheries studies have not documented any nesting activities on these waters. (Workman, Larson personal communications). Today, only one or two mid-summer sightings of male ospreys fishing these high mountain lakes indicate ospreys might be nesting in the high Uinta Mountains.

After Flaming Gorge dam was built, water clarity in the Green River and the reservoir increased. Improved habitat allowed the osprey population in Horseshoe canyon to increase. Ospreys also colonized new areas along the canyon section of the reservoir. The reservoir, while deep, is clear; thus the fish eating birds can see their prey and take them while they are near the surface of the water. Below the dam, the Green River flows clear so ospreys fish there as well although no nesting activity has yet been documented along this portion of the river.

Management

Most work done on the osprey in Utah has been done in the Flaming Gorge/Green River area. The first Flaming Gorge Reservoir osprey survey was done in 1975. The Utah Division of Wildlife Resources records indicate this survey was probably incomplete. In 1976, a more complete survey found five nests; four of which were active with a total of six young. The yearly surveys document a slow but steady increase in the population. In 1981, 13 nests were located; eight were active and 11 chicks were observed. During the 1988 survey, biologists found 34 nests, 14 were active and 25 chicks were observed.

Studies in 1989 found 21 nesting pairs and one trio. The adults raised 37 chicks. In 1990, 22 nesting pairs raised 24 chicks. Both years, 20 nests had eggs but five nests failed before they hatched. The success rates of chicks raised from hatching to the fledgling stage (2.47 young/nest in '89 and 1.6 in 1990) indicate this area has an excellent success rate. Preliminary data indicates this figure may have dropped considerably in 1991. Biologists believe it was due to a combination of factors including the weather during the early nesting period and possible aerial predation and/or human disturbance later in the nesting season.

In 1976, the DWR started a banding program. By the end of 1991 season, the biologists have banded a total of 139 chicks. A few bands have been recovered near the reservoir but, more importantly, single bands have been returned from El Salvador; Guaymas, Mexico; Chone, Ecuador; and La Paz, Honduras. From these four returns, it is clear Utah ospreys migrate considerable distances during their life cycle.

Most of the nest sites located in early surveys were in the Horseshoe Canyon area. However, only one nest was active in 1988 and '89 and all one were abandoned by 1990. Several theories as to why the area was abandoned include: 1) a change in prey base, the Utah chub population has declined in recent years; 2) an increase in boating use in the canyon which has caused more regular disturbances and has made fishing more difficult; 3) an increase in populations or a prey base change by aerial predators (great horned owls, golden eagles and falcons are present in this area). Biologists believe it is probably a combination of all of the above.

Recent surveys have observed an increase in nests in the lower reservoir area between Jarvies Bay and the dam, and near Kingfisher Island. Two master's degree studies (Stewart 1992 and Crawley - a student at BYU) have observed the ospreys to determine habitat use, seasonal life-cycle and human conflicts. These studies indicated that while this population of ospreys is extremely tolerant of humans, some human activities greatly disturb the birds and may lead to nest failure. The most disruptive activity was people hiking along the shore near the nest sites and climbing in/or around the nests. Boats moving directly toward a nest and boats stopping directly under a nest also can disturb the birds. Recent observations indicate jet skis and other similar small boats tend to disturb the birds more than the larger boats. Generally, if the boat is away from the shore and not moving directly at a nest, it is ignored by the nesting ospreys.

Project Definition

Wildlife managers are facing a world of changing wildlife values. While participation in more traditional forms of wildlife recreation such as hunting and fishing, are stagnant or slowing increasing, there is a rapidly growing public interested in wildlife viewing. This change in recreational uses has and will continue to cause conflict as the newer group demands to be heard while the older groups try to maintain traditional privileges.

Traditional users feel they have paid for the wildlife they enjoy. During times of crisis, they donated time and money to preserve wildlife populations when nobody else cared, often at great expense to themselves. The newer user groups are looking for a voice in management. A few even feel hunting and fishing should be completely eliminated. Arguments on both sides are often philosophical and can be extremely emotional. Wildlife managers are caught in the middle of these two very polarized points of view.

To meet the needs of today, wildlife managers are expanding their efforts. Wildlife habitat is being identified, protected and enhanced. Animal populations are being studied so managers can protect, stabilize or control numbers without endangering the population. But looking at the natural world isn't enough, while wildlife does quite well without people, people look to wildlife to improve the quality of their life. Human/wildlife conflicts need to be identified and impacts minimized. As a result, wildlife managers are turning to information and education programs to inform people about wildlife and the importance of habitat as well as about the values the different publics share, the threats wildlife face and how to direct energies toward common goals. The future of wildlife will depend on informed publics making informed decisions.

Wildlife biologists felt a growing concern over human impacts on wildlife with the increase and changes in recreation at Flaming Gorge. Part of the impact was a growing awareness of the osprey population as the birds and their nests are quite visible along the shores. The biologists realized not only did they need to learn more about the osprey population at Flaming Gorge, but that this was a perfect opportunity to let the public know more about the birds.

Proposal

My proposal was to photographically document a segment of the life history of this unique osprey population with a 35mm camera. I planned to follow one or more nesting pairs through their reproductive season. Documentation would start when the adults arrived and began to build nests. It would continue through the summer when the eggs hatched and the adults cared for their young, to the fall when the ospreys flew south again for the winter. This cycle was documented at two nests in 1989 and replicated at a new nest site in 1990.

The final product was to be a media presentation (using slides) on the seasonal history of the Flaming Gorge population of ospreys. The length and nature of the presentation was chosen and designed to be used in one of the Flaming Gorge visitors centers and for use in school or classroom situations. The presentation would include original slide photography, sound for audio and a corresponding educational script.

The finished product is about 14 minutes long and in the format of a slide show using two projectors. During a recent refurbishing of the Red Canyon Visitors Center, the Forest Service made the decision to install a large screen video to replace their previous video/slide capabilities. They will be given a video of the slide program for their use. The school program will be a single projector slide/tape program and/or a copy of the video.

Methods and Techniques

In 1989, blinds were set up close to two of the nest sites to reduce stress and interruptions caused by human activities. In 1990, one blind was set up at a different site. Photography was done from behind the blinds, from other sites along the shore and from a boat giving good coverage of the birds' activities. Coverage included as many activities as possible such as mate selection, mating, nest building, incubating, hunting, flying, perching, feeding and taking care of the young.

A- Blinds

Two small (two man) canvas tents were purchased and modified for use as photography blinds. The tents were actually a modular add-on room used for larger tents. The tents were similar to a normal pup tent except they had a single pole on one end and a T shaped pole on the other making the tent more box-shaped. Regular tents were used because of the length of time the blinds were to be set up and the weather conditions this area receives during the spring and summer. The blinds needed to be sturdy enough to stand up under snow storms, strong winds and thundershowers which frequent the Flaming Gorge area.

The original tent included a large window under the T pole. This was modified by adding an additional layer of camouflaged mosquito netting and then cutting both layers of the netting into six-inch strips. The layers were overlaid so the slice on one layer was covered by the netting of the other. An additional window was added to one side of the tent and modified the same way. Placement flexibility was maintained by ordering the additional window on the left side of one tent and the right on the other. Camera lenses could then be slipped through the layers of mosquito netting without leaving large, exposed holes for the ospreys to see into the blind.

The tents were ordered without a floor so they could be placed over rocks, brush and other obstacles. They were placed as close to the nests as possible but care was taken to place them far enough away so as not to interfere with normal activities of the birds. This was done by retreating well away from the blind and watching to see if the birds returned to the nest site. Generally, within 15 minutes the birds returned to normal activities. On one occasion in 1990, the blind was placed too close to the male's main perching site. When he refused to return to the perch, the female grew agitated. The blind was removed and relocated at a different nest site because no other reasonable location existed for a blind at the first nest.

B- Photography

The main camera used was a Nikon FE-2 with an autowinder. This unit was backed up by a Nikon FM and an Olympus XA. Lenses used (with the Nikon cameras) included a 35-70mm f/2.8 Tokina zoom, a 90mm f/2.5 Tokina macro, a 180mm f/2.8 Nikkor, a 300mm f/4.5 Nikkor and a Tokina doubler. During the course of the shooting, the 300mm alone or with the doubler were the most used lens or lens combinations. Whenever possible, the camera was mounted on either a tripod or a monopod. Film used was predominantly Kodachrome 64 with a scattering of Kodachrome 200, Ektachrome 200 or 400 and Fujichrome 400 depending on lighting conditions and availability of film.

During the summer of 1989, at least one day per week was spent in the blinds. Usually a second and occasionally a third day (during holidays) a week was either committed to the blinds, or along the bank and/or in the boat in order to photograph the birds away from the nest. (A boat was needed to reach most of the osprey nests and the blind sites. The DWR donated an old aluminum boat and motor for this study.) Days usually consisted of 12 to 18 hours of observation and photography. Several 24-hour watches were also done to record daily activities.

In August, 1989, I took a 10-day trip to Yellowstone National Park to meet with Terry MacKinney, ornithologist for the park. Discussions included osprey life cycle, management and human/osprey interactions. After the meeting and tour, several days were spent trying to get photos of ospreys fishing as well as ospreys nesting on other natural structures beside pinnacles.

In 1990, after going through the previous year's slides, several gaps were identified and plans made to photograph these activities. Foremost were slides of fishing activities and nest building/mating activities. Again a blind was set up and one to two days a week were spent in the blind for the months of April, May and half of June. After June, more time was spent in coves and confined areas hoping to photograph ospreys fishing.

On three occasions, a lure was set to try to bait ospreys into a cove or close to shore. A rainbow trout was tied to a float with a six foot piece of one pound test fishing line. The float was then tied to a 100 foot anchor line and set adrift. Ospreys flew over several times during the exercise but they never went after the fish nor gave any indication of seeing these fish.

Another Yellowstone trip was planned in 1990 to try to get photos of ospreys fishing there as well. While ospreys were observed fishing repeatedly, all of the shots taken both in Yellowstone and at Flaming Gorge were either too far away, blurry, too dark or otherwise unusable. During the course of my investigations I found other film makers' accounts of their attempts to film fishing activities. Generally they either resorted to filming at a fish hatchery or it took several years to film one or two strikes.

C- Audio

Osprey sounds were recorded two ways. One, by using a hand held recorder and placing it near the nest. The recorder was placed on voice activation and left on while I was in the blind. Another attempt was made by connecting a small clip-on microphone to a branch in the nest and stringing a cord back to the recorder in the blind. Neither method worked well because both picked up background noises, especially boats and other human sounds.

D - Script Development

The script was written and modified several times during 1989 and 90. Drafts were reviewed by DWR biologists, I & E personnel, teachers and the narrator who checked it for accuracy, appropriateness to the level of education and readability. The final version was then given to Clay Johnson, the narrator, who recorded the script on a reel to reel recorder at KVEL, a Vernal radio station.

The recording of the narration and slides were then taken to Ken Miller and Nancy Bostick to do the music. The recording was played while the slides were flipped manually. Ken took notes and then later played music to the sound of the recording. When he was satisfied, he used a synthesizer and a four channel recorder to record his music.

The recording of the music, bird sounds and narration were then taken to a professional studio in Orem where they were mixed together. This took two hours and was the first time anyone working on the project was paid. The narration and music have been donated.

A two slide projector dissolve unit was borrowed from Project Wild, a DWR program, and used to add the tones signaling changes in the slides. The completed program is a two slide projector slide/tape show.

During the course of the study, I also assisted another Master's student on his study, assisted DWR biologists working the the reservoir and consulted with biologists and resource managers on the ospreys in the area.

COSTS and RESPONSIBILITY

Equipment	Proposed Cost and Responsibility	Actual Cost and Responsibility
Film and Video		
35mm slide film	$200/Student, DWR, USFS	~$300/Student; ~$300/DWR**
35mm film processing	$200/Student, DWR, USFS	~$300/Student; ~$300/DWR**
video tapes	$380/USFS	not used
35mm Camera Equipment		
Nikon camera	* /student	* /Student
180mm lens	* /student	* /Student
300mm lens	* /student	* /Student
2x doubler	* /student	* /Student
tripod	* /student	* /Student
wide angle lenses	* /student	* /Student
(desired lens 600-800mm)	?/?	not available
batteries and misc.	(not identified)	$~50/Student
Video Camera Equipment		
video camera	* /USFS?	not made available
video tape recorder	* /USFS?	not made available
On Site Equipment		
Blinds	$? /DWR, BYU	$200/DWR**; ~$250/Student
boat/motor/gas	* /DWR, USFS	Boat, motor/DWR; ~$100 (gas, maintenance)/DWR
binoculars and/or spotting scope	* /DWR or * student	binoculars/Student; spotting scope/DWR

Costs continued

Equipment	Proposed Cost and Responsibility	Actual Cost and Responsibility
Transportation and Overnight Accommodations		
travel	$? /Student, DWR, USFS	~$500/Student#
use of trailer or camping	$ * /DWR, Student	$? camping/Student#
meals	$? /Student	+~$600/Student#
Production Equipment		
2 slide projectors (for use in production only, not part of a permanent show)	* /DWR, Student	* /DWR, Student
light table	* /DWR, Student	* /Student
sync unit	* /DWR, USU?	* /DWR
maps and graphics	$? /Student	~$15/Student
slides of maps & graphics	$? /Student, DWR, USFS	~$15/DWR**
3/4 inch video editing equip	* /DWR, USU	not used
audio tapes	* /USFS	~$15-20/Student
audio editing equipment	* /DWR/USU?/studios	$70 studio/DWR**; donation/ KVEL Radio, Ken Miller
reproductions of slide show	$? /Interested agency	$355 (two copies)/DWR**
reproductions of video	$? /Interested agency	
microphone	(not identified)	$25/DWR
music	$? /? (student)	Donation/Ken Miller
narration	$? /? (student)	Donation/Clay Johnson (KVEL)

Costs continued

Totals

Student#	=	~$2,015 plus equipment
DWR	=	~$ 763 plus equipment
USFS**	=	$ 600
Grand##	=	~$3,378

* Equipment already available, does not have to be purchased.
~ Approximate costs.
** USFS gave DWR $600 for project but due to mix-up, money went to BYU. DWR covered $600.
+ Approximately 60-80 days in field (not counting trips to Yellowstone). Estimate at $10/day for 60 days.
# Yellowstone trips not included, all expenses paid by student.
Local field work only, does not include Yellowstone trips or other costs involved such as attending Utah State University or travel to Logan or Salt Lake City etc..

Script

The following is a copy of the script:

OSPREY SUMMER

Ospreys Nesting on Flaming Gorge

By Ron Stewart

SLIDE	AUDIO
long fade in: osprey flying	sounds of ospreys -- fade into music
quick fade: osprey approaching nest	music continues:
QF: osprey landing on nest	
QF: slide with graphics, *Ron Stewart presents*	
QF: hold 6 seconds; slides with graphics, *OSPREY SUMMER: ospreys nesting on Flaming Gorge*	
QF: shot of Flaming Gorge in snow,	music drops, narration begins: IT'S SPRING, A TIME OF SEASONAL CHANGE,

spring flowers,	A TIME OF NEW BEGINNINGS,
osprey on wing osprey feeding young	A TIME WHEN BIRDS, LIKE OSPREYS, MIGRATE NORTH TO RAISE THEIR YOUNG.
flower	IT'S APRIL, AFTER SPENDING THE WINTER IN CENTRAL AND SOUTH AMERICA,
Map of North America: fades to map of Flaming Gorge	UTAH'S LARGEST POPULATION OF OSPREYS RETURNS TO BUILD NESTS, LAY EGGS AND RAISE THEIR YOUNG ON THE ROCKY PINNACLES OF FLAMING GORGE RESERVOIR.
CU: male osprey landing on nest wings bent, shot of male landing	OLDER, MALE OSPREYS RETURN FIRST, FOLLOWED A FEW DAYS LATER BY THE YOUNGER MALES AND FEMALES.
CU: shot of male male and female on nest	OLDER BIRDS, THOSE WHICH HAVE NESTED BEFORE, ALMOST ALWAYS PICK THE SAME PARTNER AND USUALLY RETURN TO THE SAME NEST AS LAST YEAR.
birds building new nest	THE YOUNGER BIRDS COURT PARTNERS AND PICK PLACES TO BEGIN BUILDING. SOMETIMES THEY TAKE SEVERAL WEEKS TO DECIDE ON JUST THE RIGHT SPOT.
shots of nest	A GOOD NEST SITE IS PROTECTED FROM PREDATORS, SECURE FROM THE WIND AND CLOSE TO GOOD FISHING AREAS.

shot of Gorge	THE NARROW CANYON AREAS IN THE UTAH PORTION OF FLAMING GORGE RESERVOIR MEET THESE NEEDS.
entrance to Horseshoe Canyon	HOWEVER, RECENTLY THE HORSESHOE CANYON SECTION OF THE RESERVOIR HAS BEEN ABANDONED.
map of Horseshoe Canyon	IN THE 70'S AND EARLY 80'S, HORSESHOE CANYON WAS THE MAJOR NESTING AREA FOR OSPREY.
high canyon walls in Horseshoe Canyon	THE CANYON WAS AND STILL SEEMS TO BE PERFECT OSPREY NESTING HABITAT.
shots of nests (3 slides)	THERE ARE ABUNDANT SITES FOR NESTING. THE CANYON IS PROTECTED FROM THE WEATHER AND THE STEEP CANYON WALLS PROTECT AGAINST PREDATORS.
	BUT SOMETIME IN THE MID 80'S, THE OSPREYS BEGAN TO ABANDON THE AREA.
	SIX OF THE 13 NESTS FOUND IN THE CANYON WERE OCCUPIED IN 1982.
	IN 1988 AND 89, ONLY ONE NEST WAS OCCUPIED AND NONE OF THE CHICKS SURVIVED EITHER YEAR. IN 1990, NO ACTIVE NESTS WERE FOUND.

biologist working on osprey (banding) nest with part of chub	BIOLOGISTS DON'T KNOW EXACTLY WHY, BUT MANY BELIEVE IT RELATES TO CHANGES IN THE NUMBERS OF FORAGE FISH --ESPECIALLY THE UTAH CHUB.
fisheries biologists	FISHERIES BIOLOGISTS RARELY SEE THE LARGE SCHOOLS OF UTAH CHUBS ONCE COMMON TO THIS AREA,
Yellowstone tree nest	MOST OSPREYS BUILD THEIR NESTS IN TREES BUT SOME BUILD ON ROCKY PINNACLES, TELEPHONE POLES OR OTHER MAN-MADE STRUCTURES.
pinnacle nest	THE FLAMING GORGE POPULATION IS UNIQUE, ALL OF THE ACTIVE NESTS ARE BUILT ON PINNACLES.
large pinnacle nest	IT'S NOT SURPRIZING REALLY. PINNACLES, PROVIDE A SOLID BASE THAT DOESN'T SWAY IN THE WIND. AND PINNACLE NESTS, LIKE THIS ONE, ARE DIFFICULT TO CLIMB INTO.
bird flying with nesting material	NEST BUILDING IS PART OF THE COURTSHIP DISPLAY.
male flying	ANOTHER PART IS THE AERIAL DISPLAY PERFORMED BY THE MALE OSPREY. IT BEGINS BY CALLING TO THE FEMALES WHILE FLYING.

male flying and carrying fish	THE MALE'S FLIGHT USUALLY TAKES TWO FORMS, BOUNCING UP AND DOWN LIKE A YO-YO OR A SERIES OF DIVES AND HOVERS.
similar shot of male carrying fish -- alternate shots to imitate yo-yo	USUALLY THEY CARRY SOMETHING LIKE A FISH OR NESTING MATERIAL TO SHOW THEIR HUNTING AND DOMESTIC SKILLS.
female on nest	WHEN A MALE ATTRACTS A FEMALE, SHE TAKES OVER THE NEST AND HE CATCHES FISH FOR HER.
male bringing food	BY THE TIME SHE IS READY TO LAY EGGS, SHE RELIES ALMOST EXCLUSIVELY ON THE MALE FOR FOOD.
bird building nest on old nest site	EVEN MATED PAIRS RENEW THEIR COMMITMENT BY PERFORMING COURTSHIP DISPLAYS AND BY BUILDING ONTO THEIR NESTS.
shot of an impressive nest	IT TAKES YEARS TO BUILD A NEST LIKE THIS ONE.
shot of mating	MATING USUALLY TAKES PLACE AT THE NEST, WHERE THE FEMALE SPENDS MOST OF HER TIME.
female arranging nest materials (both birds)	BESIDES FISHING, THE MALE GATHERS MOST OF THE NEST MATERIALS WHICH HIS MATE ARRANGES TO HER SATISFACTION.

shot of the nest bowl	JUST BEFORE EGG LAYING, SHE COMPLETES A BOWL IN THE CENTER OF THE NEST BY LINING IT WITH SOFT MATERIAL.
shot of eggs	SHE WILL USUALLY LAY BETWEEN 1 AND 3 EGGS. THE EGGS ARE LAID ONE AT A TIME AND USUALLY ONE TO TWO DAYS APART.
parent sitting on eggs	BOTH PARENTS INCUBATE THE EGGS BUT USUALLY THE FEMALE SITS ON THE EGGS LONGER. ALSO, SHE PREFERS TO TAKE THE NIGHT SHIFT.
male on nest with female flying away with fish	THE MALE CATCHES FISH FOR HER AND OFTEN SITS ON THE EGGS WHILE SHE EATS.
chick and egg	THE CHICKS HATCH IN FIVE TO SIX WEEKS. THEY HATCH ONE OR TWO DAYS APART SO THE FIRST CHICKS ARE LARGER THAN THE YOUNGER CHICKS.
three sizes of chicks	THE YOUNG ARE BORN HELPLESS. TOTALLY DEPENDENT ON THEIR PARENTS FOR PROTECTION AGAINST THE WEATHER, PREDATORS AND FOR THEIR FOOD.

different shot of chicks showing down (with fish)

OSPREY CHICKS HAVE A FINE COVERING OF OFF-WHITE OR BUFF COLORED DOWN WHEN THEY ARE BORN. THIS IS REPLACED BY A COARSER, WOOLY, GREY-COLORED DOWN WITHIN A COUPLE OF WEEKS.

begin series of three shots of single chick falling over chick facing away

AT FIRST, THE CHICKS, CALLED NESTLINGS, DO LITTLE BESIDES EAT AND SLEEP. THEIR EYES OPEN WITHIN A FEW HOURS AFTER HATCHING.

chick turning toward parent

WITHIN A COUPLE OF WEEKS, THEY HAVE DEVELOPED ENOUGH TO BEGIN MOVING AROUND THE NEST. EVEN SO, THEY SEEM TO BE ALL FEET AND EXTREMELY CLUMSY.

chick falling over

shot of neck feathers

THE CHICKS GROW QUICKLY. THEIR FIRST TRUE FEATHERS START APPEARING AROUND THE HEAD AND NECK AT ABOUT TWO WEEKS.

shots of darker feathers filling in

AS THEY GROW OLDER, DARKER BODY FEATHERS FILL IN THE GREY SPACES. THE LAST FEATHERS TO GROW ARE THE OUTER WING AND TAIL FEATHERS

chick(s) hidden under parent

EVEN THOUGH THE FEATHERS HAVE BEGUN TO FILL IN, THE CHICKS ARE STILL DEPENDENT ON THEIR PARENTS FOR PROTECTION.

chicks hiding in nest	SO WHENEVER THE PARENTS ARE FRIGHTENED AWAY FROM THE NEST, EVEN FOR SHORT PERIODS OF TIME, SURVIVAL OF THE CHICKS HANGS IN THE BALANCE.
clouds (rain storm)	THE BIGGEST THREAT TO THEIR SURVIVAL IS THE WEATHER.
chicks under parent on a bright, sunny day chick and female in rain storm	PROTECTION AGAINST THE SUN IS AS IMPORTANT AS PROTECTION DURING A RAIN OR THE OCCASIONAL SNOW STORM.
chicks on nest above reservoir	WHILE THE CHICKS ARE IN THE NEST, THEIR ONLY RELIABLE SOURCE OF WATER IS FROM THE FISH THEY EAT.
chicks under parent	HUDDLING UNDER THE PROTECTION OF THEIR PARENTS WINGS AND TAIL IS THE CHICKS' ONLY DEFENSE AGAINST DEHYDRATION.
female with fish female feeding young	THE CHICKS ARE ALSO DEPENDENT ON THEIR PARENTS FOR FOOD. THEIR DIET IS ALMOST EXCLUSIVELY FISH THAT'S WHY OSPREYS ARE ALSO CALLED FISH HAWKS.
male with fish showing feet and legs	THEIR LARGE STRONG FEET, SHARP TALONS AND LONG LEGS ARE SPECIALLY ADAPTED FOR CATCHING THEIR PREFERRED PREY.

biologist with chick showing the foot and talons

THE BOTTOM OF AN OSPREY'S FOOT IS RIDGED WITH SHORT SHARP SPINES TO HELP RETAIN A GOOD GRIP ON THE SLIPPERY SCALES OF A FISH.

talons & bottom of foot

adult bird on branch showing feet and talons

THE OUTER TOE ALSO ROTATES AROUND SO THE OSPREY HAS TWO TALONS FACING FORWARD AND TWO TOES FACING BACKWARD GIVING EXTRA DEXTERITY AND STABILITY FOR CATCHING AND GRASPING A STRUGGLING FISH

bird flying with fish

FINALLY, WHEN THE OSPREY FLIES, IT TURNS THE FISH SO IT FACES INTO THE WIND. THIS CUTS DOWN WIND RESISTANCE AND ADDS TO THE STABILITY DURING FLIGHT.

bird on branch

OSPREYS HUNT IN TWO WAYS, BY SITTING ON A BRANCH AND WAITING FOR A FISH TO SWIM BY OR BY FLYING OVER THE WATER ACTIVELY LOOKING FOR FISH.

bird flying

bird on branch, water visible

FLYING IS THE MOST EFFECTIVE WAY BUT IT COSTS TEN TIMES MORE IN TERMS OF ENERGY. AS A RESULT, OSPREYS WILL PERCH NEAR THE WATER FOR LONG PERIODS OF TIME.

similar shot; bird on branch, water visible, flying away

IF THEY SEE A FISH, THEY GO AFTER IT. IF THEY DON'T SEE FISH AFTER AN HOUR OR SO, THEN THEY USUALLY FLY TO ANOTHER PERCH OR BEGIN AERIAL HUNTING.

bird flying in clouds	AERIAL HUNTING IS DONE EITHER BY CIRCLING LIKE A VULTURE, HUNDREDS OF FEET ABOVE THE RESERVOIR, OR BY FLYING ALONG AT ABOUT 40 TO 50 FEET ABOVE THE WATER.
shot of feet extended for the dive successful catch, bird returning	THEY CATCH FISH BY DIVING FEET FIRST. THEY MIGHT HOVER BRIEFLY BEFORE THE DIVE OR GO DIRECTLY FROM FLIGHT. NOT ALL DIVES ARE COMPLETED AND THOSE THAT ARE, AREN'T ALWAYS SUCCESSFUL
rainbow trout feeding.	AT FLAMING GORGE, OSPREYS FEED MOSTLY ON RAINBOW TROUT AND UTAH CHUB.
male with fish on perch, wings extended	THE MALE CATCHES ALMOST ALL OF THE FISH FOR BOTH HIMSELF AND HIS FAMILY.
male with a fish on perch eating	AFTER A MALE CATCHES A FISH, HE USUALLY FLIES TO A PERCH.
male eating male flying	HE RESTS A FEW MINUTES BEFORE EATING THE HEAD AND PART OF THE BODY. ONLY AFTER HIS MEAL WILL HE DELIVER THE REST OF THE FISH TO HIS MATE.

female calling	sounds of a female calling
	THE FEMALE DOESN'T LIKE WAITING FOR HER MEAL SO SHE CALLS TO GET HIS ATTENTION. WHEN THE CHICKS GET OLDER, THEY JOIN IN.
female and chicks calling	sounds from several nests
	WHEN SEVERAL NESTS OF FEMALES AND CHICKS GET IMPATIENT, THEY CAN CREATE QUITE A RACKET.
(begins chick feeding series seven shots) male delivering fish	ONCE THE FISH HAS BEEN DELIVERED, THE FEMALE FEEDS HERSELF AND HER CHICKS BY TEARING IT INTO BITE SIZED PIECES.
female taking fish	
shots of female feeding chicks	IN GOOD YEARS, THE MALE CAN SUPPLY ENOUGH FISH FOR ALL OF THE CHICKS SO THERE IS LITTLE FIGHTING FOR FOOD.
	IN POOR FISHING YEARS, THE OLDER, LARGER CHICKS PUSH THEIR YOUNGER SIBLINGS AWAY AND TAKE THE MAJORITY OF FOOD FOR THEMSELVES.
	STUDIES ONGOING AT FLAMING GORGE INDICATE THIS POPULATION HAS ONE OF THE HIGHEST CHICK SURVIVAL RATES IN THE WORLD.
chicks next to parents, one month old	BY THE TIME THE CHICKS ARE A MONTH OLD, THEY ARE ALMOST THE SAME SIZE AS THEIR PARENTS

female together with chicks	FEMALE OSPREYS ARE LARGER THAN THE MALES AND THE FEMALE CHICKS GROW FASTER THAN THEIR MALE SIBLINGS.
chicks trying their wings	BY THE SIXTH WEEK, THE CHICKS ARE OLD ENOUGH TO START TRYING TO FLY.
close up chick flapping	THEIR WING FEATHERS HAVEN'T COMPLETELY FILLED IN YET BUT THE CHICKS TRY THEIR BEST.
chick above nest	ALMOST EVERY TIME THERE IS A BREEZE, ONE OR MORE OF THE CHICKS WILL FLAP THEIR WINGS,
chick landing on nest	OCCASIONALLY CATCHING ENOUGH AIR TO LIFT THEM UP OFF THE NEST.
chick outside nest	BY MID-AUGUST, APPROXIMATELY EIGHT WEEKS AFTER HATCHING, THE SPECKLED CHICKS HAVE STARTED TO FLEDGE OR FLY.
chick flying	THE CHICKS USUALLY DO QUITE WELL ON THEIR FIRST FLIGHTS, ONLY HAVING TROUBLE WITH THE LANDINGS OR UNUSUAL WINDS.
chicks chasing each other	THE CHICKS LEARN THE ART OF FLYING BY CHASING EACH OTHER AND OTHER BIRDS
peregrine chick	INCLUDING THIS YOUNG PEREGRINE FALCON WHO FLEDGED EARLIER.

male chasing peregrine	WHEN THE PEREGRINE GOT A LITTLE TOO AGGRESSIVE, AN ADULT MALE OSPREY CAME TO THE RESCUE.
chick perched near water	BESIDES FLYING, THE CHICKS MUST ALSO LEARN THE ART OF FISHING.
male delivering food chick eating at nest site	AFTER THE CHICKS FLEDGE, THE MALE WILL CONTINUE TO DELIVER FOOD TO THE NEST, BUT BY THE FIRST OF SEPTEMBER, MOST OF THE FEMALES HAVE BEGUN THEIR SOUTHERN MIGRATION
single chick on nest	BY MID-SEPTEMBER MOST OF THE MALES AND THE OLDER CHICKS HAVE LEFT THE RESERVOIR.
empty nest chick on branch	OCTOBER, THE NESTS ARE EMPTY, THE ONLY OSPREYS ON THE RESERVOIR ARE THE OCCASIONAL MIGRANTS FROM THE NORTH.
map showing South and Central America	THE MIGRATION AND THE FIRST FEW MONTHS AFTER FLEDGING ARE THE HARDEST FOR THE CHICKS. THOSE THAT SURVIVE WILL SPEND THE NEXT 18 MONTHS IN CENTRAL AND SOUTH AMERICA BEFORE RETURNING AS ADULTS.
adults returning	THE ADULTS WILL RETURN AGAIN IN APRIL
two adults on nest	TO REBUILD THEIR NESTS

female feeding chicks

female feeding older chicks

The End

Credits:

-Script and photography by Ron Stewart

-Narration by Clay Johnson

-Music by Ken Miller & Nancy Bostic

-Special thanks to:
Utah Division of Wildlife Resources.
Flaming Gorge National Recreation Area, U.S. Forest Service.

AND RAISE ANOTHER BROOD OF CHICKS.

music swells and continues to end of credits

Reviews

In early September 1991, the completed show was shown for the first time at Naples Elementary School in Vernal. The show was presented to the second, fourth and fifth grades in three different showings. The students and teachers were given a chance to ask questions and were asked to comment and critique the show. The students were also asked questions to see how well they understood the program.

Questions generally related to how the photography was done and physical characteristics of the bird, size, weight and wingspan. When asked for negative responses to the program, the second graders said they didn't like sharp beaks and claws. Fourth and fifth graders felt it was too short and a couple of students said it would be better if there was an actual photo of a bird fishing. The rest of the comments were all positive.

Teachers' comments included wanting to see an actual photo of a fishing osprey and wanting the program to be available to show in classrooms without having to set up the two projector program. (This is planned as part of my job with the Division of Wildlife Resources.) A couple of teachers also asked for background materials so they could talk about ospreys before or after the slide show (also being done for the DWR). Positive comments included they felt the show was as good or better than other educational programs they have access to including National Geographic and Nature. The show has since been shown to DWR employees and a few other individuals who happened to be there at that time. Comments were similar to the teachers.

Perhaps the best clue to the acceptance of the program was the level of the kids other activities while it was shown. Four of the nine teachers expressed amazement of the lack of squirming the kids did. Some shifting was done to get a better look at me or the two projector slide unit initially but after their curiosity was satisfied, the kids paid close attention to the program. This and the correct answers the kids gave to my questions, leads me to believe it is written as intended, for a fourth grade audience.

Conclusion

The media presentation Osprey Summer, Ospreys Nesting on Flaming Gorge has been completed. The two projector slide show was field tested at Naples Elementary where it was reviewed by the second, fourth and fifth grades. Teachers and students there feel the program is informative, educational and is written and done in a very understandable manner.

The presentation lacks one important item however, it does not have a clear photo or series of photos showing an osprey diving into the water after its prey. There is a photo used during that section that shows a bird with its talons and legs outstretched but it is slightly fuzzy. If, at some time in the future, I happen to actually get one or more of these photos, the slide series will be modified.

Arrangements are being made to video tape the two projector slide- show for use in schools and visitor centers. This tape should be completed by mid November, 1991. A one slide tray show will also be done so that larger groups can see it as video is best limited to small groups because of the size and clarity of the machines. Individuals at the USFS have expressed an interest in having a photo display done for one of the visitor centers or their offices but no funds have been identified.

If the ospreys continue to have the nesting success they had in 1989 and 90, their future looks extremely bright. Observations made while photographing and observing ospreys have and will help the DWR and the USFS make future management decisions on the ospreys. Biologists will continue monitoring and banding the birds to determine population structure, recruitment, migration patterns, aerial predation and more of their life history.

Appendix I

Life History of the Osprey

Description

Adult ospreys are a large, dark brown and white raptor. They stand 21 to 24 inches tall with a wing span from 4 1/2 to 6 feet. Males have an almost clear white chest and belly while females have mottled brown markings across the chest. Both sexes have a white head with a brown stripe crossing the eye.

While flying, they are most easily distinguished by the white belly, dark brown or black carpal markings (elbows), dark brown wing tips and bands on tail. Juveniles look like the adults except their chests are muddier and the dark brown feathers on their backs, wings and tail are tipped with gold, making them look like they are wearing strings of golden pearls.

Range and Taxonomy

Osprey distribution is almost global. They can be found along the waterways; oceans, seas, lakes, rivers and streams; on almost every continent . Breeding populations can be found in Europe, Asia, North and Central America, Australia and on many of the Pacific, Atlantic, Mediterranean, and Caribbean islands. Some wintering populations migrate to the southern tip of Africa and others south to about 40 degrees latitude in South America.

Breeding populations in the northern temperate to subarctic climates tend to be migratory. These populations migrate north to Europe, Asia or North America to breed and south to Africa, India, the Middle East, Southern Asia, or Central and South America to winter. The Australian populations and populations closer to the equator and/or the tropics, tend to be full-time residents, breeding and wintering in the same area.

Most birds with broad distributions, like the osprey, are usually composed of numerous populations of similar species belonging to a single genus. The osprey is taxonomically considered one species with four subraces: *P.h. cristatus*, Australasian (Australia and southern Asia); *P.h. ridgwayi* Caribbean; *P.h. haliaetus*, Palearctic (Europe, Mediterranean, and Asia, north of the Himalayas Mountains) and *P.h. carolinensis*, North American. The first two are full-time resident populations and the last two are migratory populations.

The reason the osprey has not undergone the speciation other birds have is because the northern populations are generally long distance migrants. The migrating birds often winter or pass through areas with full-time resident birds. There are records of mixed breeding pairs and these infrequent pairings have been enough to keep the populations from becoming isolated and differentiating into different species.

Reproduction

Ospreys return to North America each spring to breed and raise their young. The older males return first, followed a few days later by females and younger males. In Utah, they usually return in late March and early April. Older birds, which have successfully nested before usually return to the same nest they occupied the year previously. If one partner does not return, the other will usually find another mate. Younger birds and occasionally unsuccessful partners will court partners and select new sites to begin building their nests.

Courtship displays are important, even among older birds paired with their same partners. Nest site selection and construction are part of the courtship displays. The male selects the nest site and begins construction, usually before the females arrive. Good nest sites are secure from predators, windproof and close to good fishing areas. Most ospreys build their nests in trees but pinnacles and man-made structures are sometimes preferred as they can be better in windy areas.

Another part of the courtship displays is more visual. The male will call to the females while flying. The courting flights usually take two forms, calling while bouncing up and down like a yo-yo or a series of dives and hovers. Usually the male carries a fish or nesting material to present to the female. When a female is attracted, she takes over his nest and begins to arrange it to her satisfaction while he supplies most of the nesting materials and begins to supply fish for her. By the time the female is ready to lay eggs, she relies almost exclusively on the male for food.

Mating usually takes place on or near the nest site where the female spends most of her time. Just before she lays eggs, she will construct a nest bowl and line it with downy feathers, moss, shredded bark and other soft material. She usually lays between one and three eggs, although occasionally a female will lay four. The eggs are laid one at a time and usually one to three days apart. Both parents incubate the eggs but the female takes longer shifts while the male hunts for her.

The chicks hatch in five to six weeks. They hatch one to three days apart so the first chicks have a few days to grow larger than their younger siblings. The young are born blind, helpless and totally dependent on their parents. They have a fine covering of off-white down which is replaced by a coarser, wooly grey colored down within a couple of weeks.

Growth and Development

At first the chicks do little besides eat and sleep. Their eyes open within a few hours after hatching and within a couple of weeks they have developed enough to begin moving around the nest. Their feet seem to grow faster than the rest of their bodies so for the first month or so, they seem to be all feet and extremely clumsy.

Young chicks look quite reptilian until their feathers begin to fill in. The first feathers begin appearing around the head and neck at about two weeks and as they grow older, darker body feathers fill in the grey spaces. The last to form are the wing and tail feathers.

By the time the chicks are a month old, they are almost as large as their parents. Female ospreys are larger than the males and the female chicks grow faster than their brothers. By the sixth week, the chicks are old enough to try their wings. The wing feathers haven't completely filled in yet but the chicks will flap their wings whenever there is a breeze. By mid-August, eight to ten weeks after hatching, the speckled chicks are ready to fledge. The males tend to fledge first, possibly because the females are still growing. The chicks do well on their first flights, only having trouble with unusual wind patterns and landings.

During the next month the chicks need to perfect their flying and also learn the art of fishing. The males will continue to deliver food to the nests or directly to the chicks but by the first of September, most of the females have left the area and have begun their southern migration. The males and older chicks follow within a couple of weeks until by October, the only birds left are the very youngest and migrants from the north.

Food, Habitat, and Behavior

Young ospreys are entirely dependent on their parents for food and shelter. Ospreys feed entirely on fish and have physically adapted to catch their preferred prey. The bottom of the osprey's foot is ridged with short, sharp spines to help retain a good grip on the slippery scales of the fish. Sharp talons and the ability to rotate the outer toe so two talons face forward and two backward give extra strength, dexterity and stability to catch and grasp a struggling fish.

The osprey catches fish by diving feet first. Long, heavy, strong legs and overlarge feet allow the osprey to reach under the water. If the foot touches something, its extra fast reflexes snap the foot closed, driving the talons into the fish.

The osprey's wing shape and movement also are adapted to hunting. Ospreys have long, narrow wings with unusual dexterity. Unlike most birds, the osprey can hover in one spot while fishing. After plunging into the water, the osprey can stretch its wings up out of the water and bend the outer tips to catch enough air to fly out with its fish. Once in the air, the osprey will usually do a shiver and shake off the water in an action similar to a dog's.

Ospreys also have adapted behaviorally to catch and manage fish. Studies have shown flying is 10 + times more energy expensive than sitting so the osprey will fish from a perch to conserve energy. Ospreys tend to sit for long periods of time watching the water for fish but the most effective method of fishing is to fish while flying.

Fishing while flying tends to take two forms, flying low over the water and flying high and circling. Flying low is an active form of fishing while flying high, the birds are probably trying to locate a school or suitable water to fish. Generally the osprey will hover briefly before diving but in some areas, where the fish are more easily spooked, ospreys will dive directly from flight.

After a successful dive, the osprey may rest briefly on the water before flying out. Once in the air, the osprey rotates the fish so it faces forward into the line of flight. This cuts down on wind resistance and allows more control over the slippery fish.

Male ospreys generally feed themselves first before delivering the rest to their mates and offspring. The male will fly to a perch to eat the head and part of the body. This assures the male will be in good physical condition to continue hunting. If his first priority was to the nest, then in poor fishing years he could become too weak to fish and since he is the only provider, the male, female and all of the chicks could starve. In good fishing years, the male can catch enough fish to support all of his charges, in poor years, the larger chicks push the younger, smaller chicks aside.

Appendix II

Viewing Opportunities

Flaming Gorge Reservoir hosts the only breeding colony in the state and is by far the best, most reliable viewing area. Other breeding pairs reported include one to two pairs at Fish Lake and one or two pairs at Navajo Lake. Other possible sites include Panguitch Lake, Strawberry Reservoir, some Uinta Mountain lakes and some of the mountain lakes above Cedar City.

During the spring and fall migrations, (end of March and April, September and early October, respectively) ospreys might be seen along any major waterway in the state. Sightings are common along the fish bearing marshes, lakes, reservoirs and streams around the Great Salt Lake; the Wasatch Mountains from the Idaho border to Zions National Park; the Uinta Mountains and along the Green and Colorado Rivers.