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## PREDATION BY OSPREY ON ENDANGERED HUMPBAC CHUB

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*Key words:* humpback chub, *Gila cypha*, Osprey, *Pandion haliaetus*, Grand Canyon, Colorado River, Little Colorado River, predation.

The humpback chub (*Gila cypha*) is a large-river cyprinid endemic to the Colorado River Basin and is federally protected by the Endangered Species Act of 1973. Currently, only five populations are known, each in isolated canyon areas of the Colorado River and its tributaries (Valdez and Clemmer 1982). In the Grand Canyon a viable population occurs within a 12-km reach centered near the confluence of the Colorado and Little Colorado rivers. The chub spawn in the Little Colorado River (LCR) in early summer and are dispersed in the mainstem the remainder of the year (BIO/WEST, unpublished data). There also appears to be a resident population of chubs in the LCR.

Direct observation of avian predation on fish is common, especially for trout (e.g., Anderson et al. 1974, Wasowicz 1991). Although numerous potential predators exist in the Grand Canyon, direct observation of bird predation on humpback chub has never been reported.

Avian piscivores in the Grand Canyon include waterbirds such as herons, gulls, and mergansers, as well as raptors such as eagles and ospreys. Bald Eagles (*Haliaeetus leucocephalus*) have been observed congregating at Nankowep Creek (52.1 miles downstream from Lee's Ferry) in late winter to feed on rainbow trout (*Oncorhynchus mykiss*) moving into the creek from the mainstem to spawn.

Osprey (*Pandion haliaetus*) are considered "rare-transients" in the Grand Canyon, utilizing marsh/open water and riparian habitat as they pass through the canyon as migrants in the spring and/or fall (Brown et al. 1981). Most North American ospreys are migratory, wintering in Latin America and the Caribbean

Basin with concentrations in northern South America (Poole 1989).

On 6 September 1991 we observed an adult Osprey flying over the mainstem Colorado upstream with a fish in its talons. We had a clear view of the prey as the bird passed overhead along the shoreline at low level. The fish was positively identified as an adult humpback chub by its distinct deep body shape, its elongated, slender caudal peduncle with a deeply forked tail, and its light gray color. This observation occurred at river mile 57.1, about 6.9 km upstream of the confluence with the LCR. It is not known whether the chub was taken in the mainstem Colorado River or in the LCR.

It is likely that the Osprey captured, rather than scavenged, the fish. With rare exceptions, Osprey catch and eat live fish only. Poole (1989) found that live fish comprised over 99% of the diet of Osprey populations reviewed in literature. Osprey regularly scavenge carcasses for nesting material (Poole 1989), but these birds do not nest in the Grand Canyon.

Further possible evidence of avian predation had been discovered several months prior to this observation. On 14 May 1991 a radio-transmitter, which was previously implanted by BIO/WEST biologists into an adult humpback chub, was discovered on the bank of the LCR, approximately 30 m from the confluence. The transmitter was found among boulders, 3-4 vertical meters above the water surface. No remains of the fish were located in the area, but one white feather was found stuck to the transmitter. An Osprey was observed frequenting the LCR confluence area on 12 and 13 May. We believe this fish

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was taken by an Osprey, rather than found dead and removed from the water by a scavenger (e.g., coyote, raven, ringtail). Before its tag was discovered on the bank, the fish was successfully monitored for three months following implanting and had moved nearly one mile to the confluence and then up the LCR, indicative of a healthy fish. To date, we have never discovered a dead ("floater") fish out of 75 implanted humpback chub monitored for 6–12 days every month but December. Also, humpback chubs staging at the confluence, prior to migration up the LCR to spawn, were observed swimming near the surface of the water in May. Osprey can forage only to about 1 m below the water's surface and therefore are able to catch fish only near the surface of the water (Poole 1989).

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