

Wintering Bald Eagles Along the Colorado River Corridor

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The construction and operation of reservoirs have had a dramatic influence on wintering and migrant bald eagles (*Haliaeetus leucocephalus*; Southern 1963; Spencer 1976; Steenhof 1978; Stalmaster 1987). In contrast to reservoir-induced destruction of riverine habitat upon which many wintering bald eagles have traditionally relied, reservoirs may harbor, in some instances, new or alternative food sources (Spencer 1976; Jenkins 1992). In addition to hunting the shorelines and surface waters of reservoirs, eagles congregate below some dams in winter to feed on fish that are killed or stunned while passing through the turbines or to hunt in ice-free water (Steenhof 1978).

Commercial river guides on the Colorado River first noted winter bald eagle concentrations on the southern Colorado Plateau below Glen Canyon Dam at Nankoweap Creek in the early 1980's (Fig. 1). Before this, bald eagles were considered uncommon along the Colorado River in Grand Canyon National Park (Brown et al. 1987). A preliminary study by Brown et al. (1989) concluded that wintering bald eagles had increased in numbers, particularly below Glen Canyon Dam, because of a combination of regulated discharge of cold water from the dam and the introduction of rainbow trout (*Oncorhynchus mykiss*). Although trout were introduced by the National Park Service into

tributaries of the Colorado River in the 1920's, it was not until after the dam was completed (1963) that trout numbers increased in the Colorado River. By 1988 the mouth of Nankoweap Creek had become a concentration

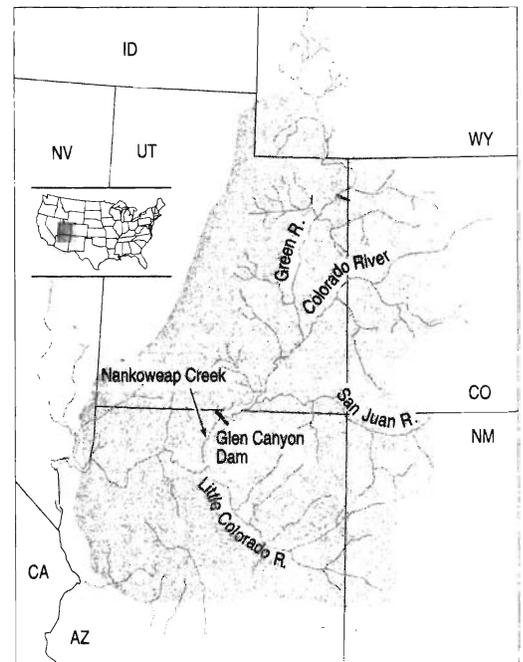


Fig. 1. The Colorado Plateau.

point for foraging because of the ease with which spawning trout could be obtained by eagles.

The concentrations of wintering and migrant bald eagles at Nankoweap are analogous to how eagles formerly concentrated at McDonald Creek in Glacier National Park, Montana (McClelland 1973). There, the introduction of non-native kokanee salmon (*Oncorhynchus nerka*) eventually attracted hundreds of migrant bald eagles (McClelland et al. 1982). The subsequent introduction of exotic zooplankton into Flathead Lake recently caused the collapse of this salmon population and ended the concentration of wintering eagles. In Grand Canyon National Park, it was felt that if the number of spawning trout remained high in the Colorado River tributaries, bald eagles might continue to concentrate there for food, as happened along McDonald Creek at Glacier National Park.

This article outlines the 1989-94 status of wintering bald eagles along the Colorado River corridor, from the Glen Canyon Dam through Grand Canyon National Park. We also discuss the trends of bald eagle numbers as determined from monitoring eagle and fish populations throughout the river corridor.

We determined the annual status of bald eagles from 1990 to 1994 by direct ground observations from the river bottom at the confluence of Nankoweap Creek and the Colorado River, and from aerial censusing flights from January through April.

Trends

Aerial Surveys

Wintering bald eagles were present each year along the Colorado River corridor from late fall (October-November) through early spring (March-April). During the 1990-91 aerial censusing surveys, peak numbers occurred in January and February, so aerial surveys in subsequent years were confined to December through March (Fig. 2). Eagles were observed on every flight, with numbers ranging from 2 (in March 1993) to 23 (in February 1991). Bald eagles were generally distributed evenly along the river corridor except in January and February, when conditions were suitable and rainbow trout were spawning in tributaries (Leibfried and Montgomery 1993). During these 2 months birds concentrated at the small tributaries.

Ground Surveys at Nankoweap

The trend of bald eagle numbers at Nankoweap Creek was for birds to closely parallel spawning trout numbers (Fig. 3). During 1990-91 we recorded the highest known bald

eagle concentration at Nankoweap Creek with up to 26 eagles present on a peak day (Fig. 4). About 70-100 individuals were documented during the eagle concentration (when at least 10 eagles were present each day) from 8 February to 8 March 1990. The previous high of 18 wintering eagles was recorded at Nankoweap in February 1988 (Brown et al. 1989). The trend was for fewer numbers of trout and birds in following years (Fig 3). For example, in 1993 when spawning was extremely low in Nankoweap Creek, there were concomitantly low numbers of eagles. In 1994 spawning trout numbers were also low in the creek and few bald eagles were found in the area.

Other Areas of the Plateau

During 1992-94 when the numbers of wintering bald eagles along the Colorado River were low (Fig. 3), concentrations of bald eagles were reported at other locations on the southern Colorado Plateau. For example, in 1992, Bureau of Reclamation pilots (personal communication) noted eagle concentrations at the junction of the Green and Colorado rivers (Fig. 1). During 1993 the Arizona Game and Fish (personal communication) reported up to 20 eagles at Lake Mary, just east of Flagstaff, Arizona. These birds were feeding on some of the thousands of rainbow trout the agency had stocked into the lake during the winter. In 1994, another year of low bald eagle numbers along the Colorado River corridor, we received numerous reports from state and federal agency biologists of small eagle concentrations at elk and deer carcasses over the southern Colorado Plateau.

Status

The status of bald eagles along the Colorado River, especially in portions of Grand Canyon National Park and Glen Canyon National Recreation Area, has been improved by an increase in numbers of introduced rainbow trout. For example, at Nankoweap Creek, the trend went upward from a few birds starting in the mid-1980's to peak numbers in 1990-91. In following years (1992-94), poor rainbow trout spawning resulted in low numbers of bald eagles in this region. Creek morphology and flow conditions varied among years and influenced the availability of trout, and thus eagle numbers.

Bald eagles at Nankoweap, however, can be the largest such concentration in the southwestern United States. The 70-100 individual eagles recorded during 1990 represent what is believed to be one-fourth of the entire population of bald eagles wintering to the south of the Grand Canyon (in Arizona and northern Mexico). We expect that wintering eagles will continue to

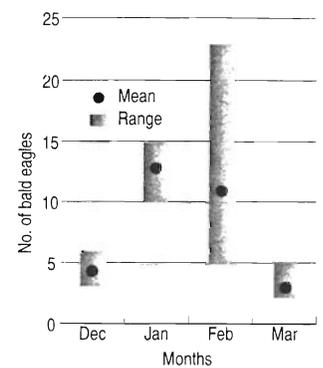


Fig. 2. Average number of bald eagles detected each month (1990-94) during aerial surveys along the Colorado River from the junction of the Little Colorado River north to Glen Canyon Dam.

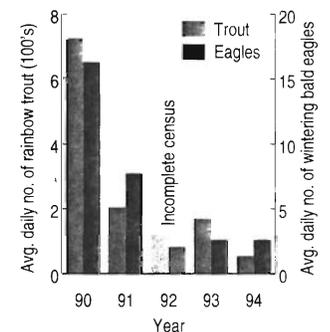


Fig. 3. Average daily numbers of rainbow trout and bald eagles at Nankoweap Creek in Grand Canyon National Park, AZ. 1990-94.

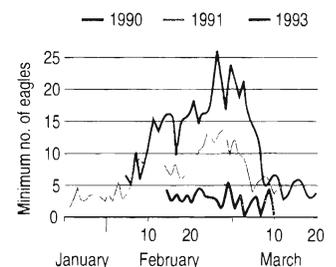


Fig. 4. Bald eagle abundance at Nankoweap in 1990, 91, and 93.

frequent this region if annual spawning trout are present.

Bald eagle counts along the Colorado River corridor during the winters of 1990-94 mirrored the bald eagle numbers at Nankoweap Creek. Their numbers peaked during late February and early March and varied greatly among years. Higher concentrations of bald eagles noted in other areas of the southern Colorado Plateau, when lower numbers were recorded along the Colorado River, suggest widespread eagle movements over the region. Bald eagles appear to concentrate in areas that have the most abundant and available food resources, and these locations change annually.

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