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*Kansas Natural Heritage Inventory*

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## Nesting Piping Plover and Least Tern on the Kansas River

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Kansas Natural Heritage Inventory, Kansas Biological Survey, 2041  
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**ABSTRACT** – A portion of the Kansas River in northeastern Kansas was surveyed by boat and air in 1996 and 1997 for nesting colonies of piping plover (*Charadrius melodus*) and least tern (*Sterna antillarum*). Both species were found breeding on sandbars at a total of five sites along a 30-km reach of the Kansas River. In 1996, at least two breeding pair of piping plovers and seven breeding pair of least terns were documented. In 1997, at least one pair of piping plovers and five pairs of least terns bred. These are the first known breeding records for the piping plover in Kansas and the first breeding records for the least tern on the Kansas River. We suspect that breeding habitat for these species increased after heavy flooding in 1993 scoured riparian vegetation and created new sandbars. Such flood events are now rare on the Kansas River because much of the flow in the basin is controlled by impoundments constructed since the 1950's.

**Key words:** *Charadrius melodus*, *Sterna antillarum*, breeding biology, shorebirds, Great Plains, Kansas River.

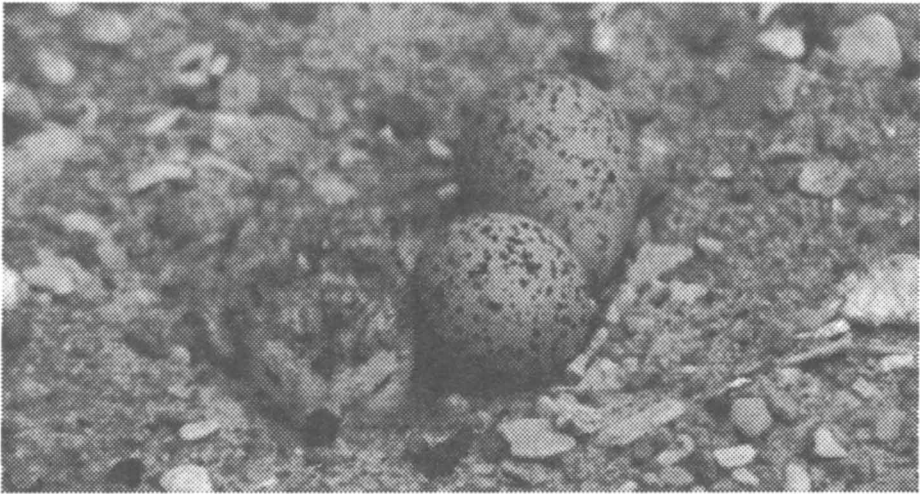
The piping plover (*Charadrius melodus*) and least tern (*Sterna antillarum*) occupy beaches, alkali flats, and open sandy habitats in North America. In the Great Plains, the piping plover is a threatened species that breeds from Nebraska north to the southern Prairie Provinces in Canada (Haig 1992). In the central Plains, nesting occurs mostly on sandbars on the Platte, Loup, Niobrara, and Missouri rivers in eastern and central Nebraska and the Missouri

River in South Dakota (Haig et al. 1988). Breeding also has been documented in the Oklahoma panhandle at Optima Reservoir (Boyd 1991) and in southeastern Colorado (Kingery 1989). No breeding records exist for Kansas where the species is a rare transient (Thompson and Ely 1989). The least tern is an endangered species that breeds along rivers and salt flats at scattered locations throughout the Great Plains (Whitman 1988, Thompson et al. 1997). In Kansas, it presently breeds at Quivira National Wildlife Refuge (Boyd 1990, 1992), along the Cimarron River (Schulenburg et al. 1980, Boyd 1990, 1992), and at the Jeffrey Energy Center in Pottawatomie County (Kansas Natural Heritage Inventory unpubl. data).

On 10 July 1996, one adult piping plover on a nest with three eggs was found along the Kansas River upstream of Wamego, Kansas. When flushed from the nest, the adult performed a broken wing display before returning to the nest (Fig. 1). Only the one adult was seen during 20 min. of observation. The nest was located on a shallow ridge of coarse sand less than 20 m from the river. The site was on a new channel of the river created during high water in 1993. The sandbar was approximately 700 m long, up to 500 m wide and was unvegetated except for patches of recently established willow (*Salix* sp.). When this site was revisited on 17 July the nest contained two eggs and one chick (Fig. 2).



**Figure 1.** Piping plover performing broken wing display near nest on the Kansas River.



**Figure 2.** Piping plover nest on the Kansas River containing one chick and two eggs.

Also on 17 July at another site approximately 1 km upstream, a nesting colony of least tern was discovered on a large (approximately 200 m x 700 m) sand spit. Fourteen adults, 12 juveniles, and one egg were counted. The sand spit was along the old channel of the river that had been cut off during the 1993 flood. The tern nesting activity was located on the highest portion of the spit about 500 m from the river. Also at this site were two adult piping plover with at least two fledged young. The plovers were foraging near the river on the same sandy spit and on an adjacent sandbar.

During an aerial survey of the Kansas and Republican rivers on 18 June 1997, least terns were seen on the Kansas River at Silver Lake (one bird), ca. 6 km downstream of Wamego (five birds) and ca. 6 km upstream of Wamego (eight birds). On 16 July 1997, the Kansas River was surveyed by boat from the confluence of the Big Blue River to 6 km downstream of Wamego. Least terns were observed at two sites. The first site was the 1996 least tern nesting site where a pair of adults was observed. The second site was ca. 2 km farther downstream on a large sand island where nine adults, one fledged juvenile, and four nests with one or two eggs each were observed. Piping plovers were also seen at two sites. One adult with two downy young was observed on a large sandbar downstream of the confluence of the Big Blue River, and a second adult was seen foraging on a sandbar downstream of Wamego. In addition, on 6 July 1997 one adult piping plover was observed foraging near the 1996 plover nest site.

These are the first breeding records for the piping plover in Kansas and also the first breeding record for the least tern on the Kansas River, although it has bred on upstream tributaries in the watershed (Schulenberg et al. 1980) and nested at the Jeffrey Energy Center site (ca. 10 km north of the Kansas River) since 1994. Little is known about historic use of the Kansas River by piping plover and least tern.

We speculate that the recent presence of these two species on the Kansas River is due to habitat created by the 1993 flood. Peak discharge at Wamego in 1993 was 199,000 cfs (USGS 1997), which is over six times greater than the average peak annual flow on the Kansas River for the previous 30 years (Table 1). Extensive flooding along the Kansas River in 1993 scoured sandbars of vegetation and created new sandbars. These open, sparsely-vegetated sites were being used by piping plover and least tern for nesting in 1996 and 1997. However, in the absence of additional scouring floods, these areas are likely to become increasingly less suitable for nesting by these species due to vegetation encroachment. The hydrology of the Kansas River basin has been substantially altered by construction of impoundments and other developments. At present, 18 large reservoirs and over 13,000 smaller impoundments (Mundorff and Scott 1964) control over 80% of the Kansas River drainage (Simons, Li & Associates 1984). Water release practices from these reservoirs have changed natural flow conditions on the Kansas River by reducing peak flows, altering the timing of peak flows, and trapping sediment (Simons, Li & Associates 1984, Saunders et al. 1993). Annual peak flows on the Kansas River at Wamego were substantially higher prior to a major dam construction period in the 1950's and 1960's (Table 1). On other prairie rivers, the effects of water release practices from upstream reservoirs have allowed vegetation encroachment of sandbars, reduced sandbar formation, and produced higher flows during the nesting season, all of which have negative effects on nesting piping plover and least tern (Schwalbach 1988, Sidle et al. 1992, Ziewitz et al. 1992).

**Table 1.** Annual peak discharge figures for Kansas River at Wamego, Kansas. The 1922-1952 period is prior to most impoundment construction in the watershed, and the 1962-1992 period is after substantial impoundment construction. Data are from U.S. Geological Survey (1997).

Period	Mean annual peak discharge (SE)	No. years with peak discharge >70,000 cfs	Maximum discharge(year)
1922-1952	60,258 (72,660)	9	400,000 (1951)
1962-1992	32,012 (14,199)	1	72,900 (1973)

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