Least Tern Nesting at Human Created Habitats in Central Nebraska

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Abstract.—Least Terns (*Sternula antillarum*) have been documented as nesting along the central Platte River of Nebraska since 1949. The very first accounts of birds were on an island "which was formed in the dredging of sand" (Wycoff 1950). Since that time more than 90% of the documented nests occur on human created habitats consisting of commercial gravel mines and constructed river islands. From 1991 to 2005, Least Tern nests were monitored at sandpits that were managed specifically for nesting Least Terns and islands constructed in the Platte River and managed specifically to provide nest sites for Least Terns. In addition a set of sandpits which did not receive any management were monitored from 1994 to1997 to compare reproductive output to the managed sandpits. During the study period 647 Least Tern nests were documented at all sites. Of the nests observed 125 were on unmanaged sandpits, 473 were on managed sandpits and 49 were on islands. Hatching success for those nests was 38% on unmanaged sandpits, 65% on managed sandpits and 71% on constructed riverine islands. A total of 639 Least Tern chicks were observed to have fledged from these nests. Production of fledged chicks per nest for each type of nesting site were unmanaged sandpits 0.56 fledglings/nest, managed sandpits 1.13 chicks/nest and islands 1.04 chicks/nest. Nest success and fledgling survival was significantly greater at managed sandpits than unmanaged sandpits in the 1994 to 1997 time period. *Received 20 March 2007, accepted 10 November 2007.*

Key words.—central Platte River, fledge ratio, islands, Least Tern, human created habitats, nest success, sandpits, *Sternula antillarum.*

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Least Terns (*Sternula antillarum*) (AOU 1998) were documented as common nesters in northeast Nebraska along the Missouri River by the late 1800s (Bruner *et al.* 1903). Historical accounts of Least Terns nesting on the Platte River in Nebraska were near North Platte, Nebraska in 1916 and again in 1926 through 1930 (Tout 1947). Additional records of nesting on the South Platte River near North Platte were made in 1948 and 1949 (Ducey 1985). The first documented nesting of Least Terns in central Nebraska (Lexington, NE to Chapman, NE) were on a human created island in the Platte River near Lexington, Nebraska in 1949 (Wycoff 1950). Least Terns were documented as nesting at this site or nearby sandpits until 1959 (Wycoff 1960). Faanes (1983) found Least Terns nesting at both river islands on the central Platte River and at sandpits adjacent to the central Platte River in 1979.

Interior Least Terns were listed as an endangered species in 1985 (U.S. Fish and Wildlife Service 1985) at which time systematic surveys began along the central Platte River in Nebraska (defined for this study as the reach from Lexington to Columbus, Nebraska). Surveys of all potential habitats along the central Platte were not conducted in each year, however, of all Least Tern nests found over 90% have been on human created habitats (Sidle *et al.* 1991; Lingle 1993a; Sidle and Kirsch 1993; Jenniges 2005). Human created habitats referred to in this study are of two kinds: sandpits and riverine islands. Sandpit habitat is a by-product of commercial gravel mining and consists of small groundwater fed lakes with gently to steeply sloping piles of fine sand substrate either in peninsulas or as islands. Riverine islands were created and managed purposely as nesting habitat for Least Terns and Piping Plovers (*Charadrius melodus*) (Currier and Lingle 1993; Plettner 1993).

From 1985 to 1990 the central Platte River and all sandpits within 4.8 km of the river were surveyed for nesting Least Terns (Lingle 1993a). These surveys documented 447 Least Tern nests from 1985 to 1990 with 83% on sandpits, 10% on natural river islands and 7% on human created islands (Lingle 2004). In 1991 all Least Tern nesting was on either human created islands or at sandpits adjacent to the river with the vast majority on adjacent sandpits (Sidle *et al.* 1991). From 1991 to 2005, 342 out of 344 Least Tern nests identified during annual mid-June censuses along the central Platte River were on human created islands or sandpits (Jenniges 2005). Documentation of nest locations along the central Platte River is relatively complete, information on the fate of those nesting efforts is limited (Lingle 1993a; Jenniges 2005).

Habitat management for Least Terns along the Platte River begin in 1990 and focused on the creation of riverine nests sites (Currier and Lingle 1993). In 1991 as part of a Federal Energy Regulatory Commission relicensing effort for a hydro-electric generating plant which utilizes Platte River water the Nebraska Public Power District began construction and management of nesting habitat for Least Terns (Plettner 1993). These habitats consist of two main types created riverine islands and sandpits. The objective of habitat management was to attract nesting birds and maintain fledge rates above the 0.3 fledglings per pair thought to maintain populations in EA Engineering (1988). Management actions were evaluated by monitoring of all nests and reproduction at created islands and managed sandpits. In addition to monitoring to see if management objectives were met it was desirable to evaluate if management efforts actually made a difference over what was naturally occurring, therefore a group of sandpits with known nesting but no management were monitored from 1994 through 1997. This paper summarizes information obtained from the 15 years of monitoring effort of Least Tern nests on all monitored sites. The differences in reproductive parameters at managed and unmanaged sandpits in the 1994-1997 time frame are examined to look at the effectiveness of the management during that 4 year time frame.

METHODS

Study Area

Monitoring of nests occurred at three constructed riverine islands in the central Platte River and at seven sandpits along the central Platte River (Fig. 1). All created islands and managed sandpits were within a 40-km reach along the central Platte River between Odessa, Nebraska and Lexington, Nebraska. Managed sites were Bluehole Sandpit, Johnson Sandpit and Elm Creek Island were near Elm Creek Nebraska, Overton Island near Overton, Nebraska and Lexington Island and Lexington Sandpit near Lexington, Nebraska.

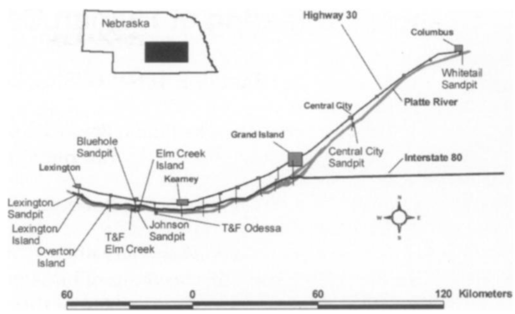

Figure 1. Location of Least Tern nesting sites monitored along the central Platte River in Nebraska.

Sandpits that were monitored but unmanaged include one south of Odessa, Nebraska (T&F Odessas), one near Elm Creek, Nebraska (T&F Elm Creek), one south of the river channel at Central City, Nebraska (Central City) and one between the Platte and Loup Rivers near Columbus, Nebraska (Whitetail). Nests at these sandpits were monitored from 1994 through 1997.

Management activities at the managed sandpits and created islands included vegetation control measures to maintain the bare sand nesting substrate, people management and predator management. Methods of vegetation control have been similar at both the sandpits and islands. Different vegetation control measures were evaluated by comparing percent vegetative cover in randomly placed plots on the nesting sites and by setting up a series of experimental vegetation control plots at one site. Vegetation control methods evaluated were human labor, mechanical control, and chemical control. Vegetation control using pre-emergent herbicides in the spring before Least Terns arrive was chosen based upon results of the measurements taken. In addition large equipment, such as bulldozers and excavators, was used to remove vegetation that grew in areas that could not be treated chemically. Management at all sites included people management through the use of signs indicating the presence of nesting endangered species and exclusionary fencing. Predator control measures included electric fences at all sites with nesting birds. Where feasible on sandpits, fences were 1.3 m tall permanent 4- to 6-strand high tensile electric wire in front of 9-cm^2 mesh horse fence covered with fence that has 2.5-cm openings. On islands and at sandpits where permanent fences were not feasible 1.2-m high electric mesh fences with alternating hot and ground wires are temporarily installed during the nesting season. All fences were powered by 12-V electric fence controllers and batteries were charged using solar panels. In addition the U.S. Department of Agriculture Wildlife Services was contracted to remove predators from the area immediately surrounding the managed sandpit nesting sites. Predator removal was not implemented at the constructed island nest sites.

Nest Monitoring

Nest monitoring began the first week of May in all years from 1991 to 2005. If no nests were detected, a site was visited once a week until the first week of July. If nests of Least Terns and/or Piping Plovers were detected, visits were made every other day and at a minimum twice a week. Not all sites were monitored in all years and not all sites had nesting Least Terns in all years (Table 1). During each visit the location of potential nests were plotted on aerial photos or hand drawn maps of the area if photos were unavailable. A potential nest was defined as the location of a single adult bird in an incubating posture. If a bird in incubation posture was observed in the same place on two consecutive visits it was called a nest with an initiation date the same as the first observation. Also, any scrape in which at least one egg was observed was called a nest.

All observations took place from distances great enough so that the birds were not flushed from nest or illicit mobbing behavior from non-incubating adults. Observation distances ranged from 20 m to 200 m. Observations were made using 10× binoculars or variable power spotting scopes. Intrusion into the immediate vicinity of the nests was only to determine cause of loss when it was noted that nests or chicks were lost. When such visits were conducted, an attempt was made to locate all active nests that could be found in 15 min and count eggs.

Each nest was observed until hatching or loss. A nest was considered successful if it hatched at least one egg. Once hatched, an attempt was made to keep each brood separate. Visits continued until all chicks were fledged or lost. No birds were marked so the estimated number of breeding pairs was defined as the maximum number of nests and broods present on a single visit (Kirsch 1996). Results presented as fledglings per pair were calculated using this estimate. Results are also presented as fledglings per nest. Chicks were considered fledged when they were 21 d of age or observed flying a distance of more than 3 m. Age of chicks was based on known hatch dates and observed characteristics (e.g., feathering, size). Additional data collected for each nest included date of first observation, predicted hatch date, actual hatch date, number of initial chicks observed and number of chicks observed at age 15 d.

Data Analysis

Nest success was calculated as both apparent nest success and with Mayfield method (Mayfield 1975). Equations used for the Mayfield (1975) nest success estimator were $P = (1\text{-}N/E)^h$ and confidence intervals were $P \pm 2(SE)$ where $SE(P) = (\{P\text{-}P2\}/N)^{1/2}$ (Murphy *et al.* 1999). The nests monitored were highly detectable, easily observed on a regular basis after detection and losses were often catastrophic making it likely that the apparent nest success is the most accurate estimate of true nest success (Kirsch 1996; Johnson and Shaffer 1990). Individual chicks were not marked, however the small size of the nesting areas, low density of broods, frequency of visits and the ability to observe birds from a distance without disturbing them allowed for what we believe is a realistic estimate of the number of fledglings. The timing of nest initiation for successful and unsuccessful nest as well as comparisons of nest initiation dates between types of nesting areas was done using one-way analysis of variance (Zar 1984). Linear regression (Neter *et al.* 1985) was used to model nest success in relationship to first observed date through the nesting season. Chi-square analysis (Zar 1984) was used to examine if nest success and chick survival to fledgling was different at managed and unmanaged sandpits. Constructed islands were not included in this analysis due to the small sample size from islands. All statistical analysis was conducted using Statistix Version 8 (Analytical Software 2003).

RESULTS

A total of 2,002 h were made in direct observation of nesting Least Terns by one or two observers between 1991 and 2005. Managed sandpits and islands were monitored from the time of creation or management begin through 2005. Unmanaged sandpits were only monitored in the years 1994-1997. During the study period a total of 647 Least Tern nests were observed; 473 at managed sandpits, 125 at unmanaged sandpits, and 49 at constructed river islands (Table 2).

The earliest Least Tern nest was observed on 20 May and the latest nest initiation was observed on 02 August. Nest initiations increased rapidly, peaking in late May through early June, and then declined throughout the remaining nesting season (Fig. 2). For

Table 1. Areas monitored for Least Tern nesting along the central Platte River. *Indicates the area is known to have had nesting outside the dates indicated but was not part of this monitoring effort.

Site	Location	Years monitored	Years with nesting	Years managed
Johnson Sandpit	Elm Creek	1991-2005	1991-2005*	1991-2005
Lexington Sandpit	Lexington	1992-2005	1992-2005*	1992-2005
Bluehole Sandpit	Elm Creek	1994-2005	1994-2005	1997-2005
Overland Sandpit	Central City	1994-1997	1994-1997	None
T&F Odessa	Odessa	1994-2005	1994, 1995, 1997	None
T&F Elm Creek	Elm Creek	1994-2002	1994, 1995	None
Whitetail	Columbus	1997	1997*	None
Elm Creek Island	Elm Creek	1991-2005	1991, 1995-1998	1991-2005
Overton Island	Overton	1993-2005	1993, 1995-1999	1993-2005
Lexington Island	Lexington	1992-2005	None	1992-2005

Table 2. Number of Least Tern nests at sites monitored along the central Platte River 1991 to 2005.

Year	Managed Sandpits	Unmanaged Sandpits	Islands	Total
1991	7	NA	1	8
1992	31	NA	0	31
1993	29	NA	4	33
1994	34	46	0	80
1995	36	30	14	80
1996	30	19	13	62
1997	34	30	10	77'
1998	31	NA	4	35
1999	24	NA	3	27
2000	21	NA	0	21
2001	25	NA	0	25
2002	37	NA	0	37
2003	47	NA	0	47
2004	43	NA	0	43
2005	44	NA	0	44
Total	473	125	49	647

successful nests (N = 406) the average observation time was 20.9 ± 0.4 d. Thirty-two successful nests (8%) were observed for over 25 d (Fig. 3) the upper end of incubation duration in Thompson *et al.* (1997). Only two broods were observed in areas where a nest had not been detected.

There was no discernible pattern of the timing of nest loss (Fig. 3). Average observation time for unsuccessful nests was 14.8 ± 1.1 d. Twenty (8%) unsuccessful nests were observed longer than the average of 21 d for successful nests. On six occasions the adults eventually abandoned the eggs, which were addled; one or more adult incubated one nest for 47 d. Fourteen of these 20 long incubating nests were lost to either unknown causes or depredation. Seven of these long incubated nests were subsequently depredated with five by Coyote (*Canus latrans*) or domestic dog and two by Raccoons (*Procyon lotor*).

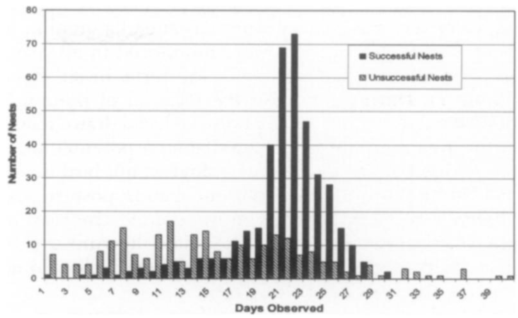

Figure 3. Length of time Least Tern nests were observed along the central Platte River, Nebraska.

There was a significant difference (p = 0.0009) in the average date of first observation of successful nests (N = 407) as compared to unsuccessful nests (N = 238) with successful nests detected 4 d earlier on average. A regression analysis (R-squared 0.44) of the trend (Fig. 4) for proportion of successful nest by week of initial observation shows a significant (p = 0.01) decline in nest success through the nesting season; earliest observed/initiated nests were more likely to hatch.

Overall 406 of 647 nests were successful in hatching (Table 3) and there were no direct observations of nest loss. Depredation events were inferred using evidence such as tracks or talon and wing marks in the sand at or near the nest bowl of a known lost nest.

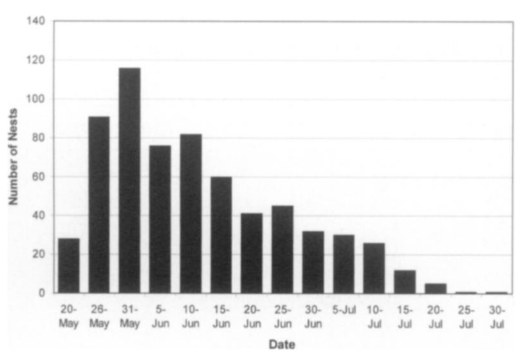

Figure 2. Nest initiation dates for Least Terns at sites monitored along the central Platte River, Nebraska 1991 to 2005.

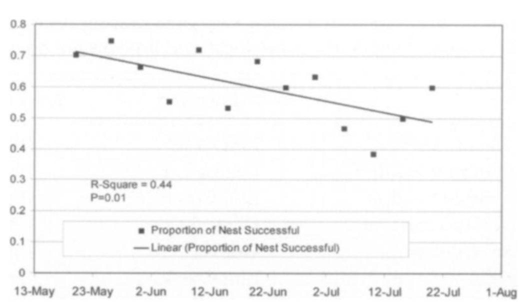

Figure 4. Regression analysis of the proportion of observed Least Tern nests which were successful through the nesting at human created habitat along the central Platte River, Nebraska.

Table 3. Nest success for Least Terns nesting at sites monitored 1991-2005. Success shown as apparent as well as the Mayfield estimate with 95% confidence intervals calculated.

Management type	Number of nests	Apparent nest success	Mayfield nest success	Mayfield lower 95% C.I.	Mayfield upper 95% C.I.
Unmanaged sandpits	125	38%	36%	29%	45%
Managed sandpits	473	65%	64%	59%	68%
Managed riverine islands	49	71%	69%	56%	84%
Total	647	63%	61%	57%	65%

Of the 241 nests suspected lost to predation, 147 (61%) were lost to depredation by Coyotes or domestic dogs. Other suspected predators in descending order of attributed depredation events includes snakes (12%), Mink (*Mustela vison*) (12%), Raccoon (7%), hawks/owls (6%), Skunk (*Mephitis mephitis*) (2%), Great Blue Heron (*Ardea herodias*) (1%) and Canada Goose (*Branta canadensis*) (1%). In each case with Canada Geese tracks and egg remains indicated they either stepped on eggs or kicked them out of the nest bowl while walking. In addition there were 56 nests for which the cause of loss was not determined. It is the opinion of the authors that much of this undetermined nest loss was likely due to small predators such as mink which leave little sign of their presence. Weather associated losses accounted for 21 nests. Loss to some weather events are easily determined and in this study include finding dead adults on the nest after a hail event, eggs smashed by hail and eggs found down slope washed from the nest bowl during heavy rain. Humans were the cause of destruction at eight nests. Nine nests were abandoned before the end of incubation, cause of abandonment was unknown.

A total of 852 Least Tern chicks were observed initially from 392 successful nests; for 15 nests no initial estimate of chick numbers was made although the nest was observed to hatch (Table 4). Of the 407 nests known to have hatched, 314 (77%) were estimated to have fledged at least one chick. It is estimated that 639 chicks fledged during this study, 75% of chicks hatched. Of fledged chicks 162 (25%) were observed in flight at an average age of 19 ± 1 d. All other chicks were considered fledged when they reached 21 d without observing sustained flight. Observed causes of chick loss were rare, with a single observation of predation by a Red-tailed Hawk (*Buteo jamaicensis*) and one case of chick abandonment late in the nesting season. Based on available evidence predation was suspected in 38 incidents of chick loss with Mink being the most common predator. Other identified causes of chick loss, in descending order of occurrence, were Coyotes/dogs, hawks/owls, Raccoons, snakes and cattle. The cause of approximately half of all suspected chick losses could not be determined. Weather related mortality such as chick loss during high winds, or cool wet periods were difficult to identify but, likely accounts for a portion of the suspected chick loss.

Overall, 647 nests produced an estimated 639 fledglings for a ratio of 0.99 fledglings per nest. Using the definition that pairs are

Table 4. Least Tern reproductive output at nesting sites monitored. Successful nests are those that hatched at least one egg, successful broods are those broods where at least one chick fledged.

Management type	Total nests	Successful nests	Estimated successful broods	Number of initial chicks observed	Number of chicks fledged	Percent of chicks fledged
Unmanaged sandpits	125	48	32	101	54	53%
Managed sandpits	473	309	254	679	534	79%
Managed river islands	49	35	28	74	51	70%
Total	647	392	314	854	639	75%

equal to the maximum number of active nests (incubating adults) and broods (adults with chicks) present there were 553 pairs total for a fledgling per pair ratio of 1.15 (Table 5).

Monitoring of unmanaged sandpits occurred during the nesting seasons of 1994 through 1997. During this time period 134 Least Tern nests were observed on managed sites and 125 Least Tern nests were observed on unmanaged sites. Managed sandpits had an apparent nest success rate of 70% and unmanaged sandpits had an apparent nest success rate of 38%. Chi-square analysis indicated that the occurrence of successful nests on managed sandpits was higher than expected based upon nest success at unmanaged sandpits (chi-square = 26.32, $P < 0.001$). From 1994 through 1997 Least Terns initiated nests significantly earlier ($P = 0.0001$) on managed sandpits than they did on unmanaged sandpits or islands (Fig. 5).

From 1994 to 1997 on managed sandpits, 73% of all observed chicks survived and fledged for a total of 155 fledglings. On unmanaged sandpits, 53% of all observed chicks survived with 54 chicks fledging. Chi-square analysis showed that chick survival (chi-square = 11.9, $P = 0.001$) on managed sandpits was higher than expected based upon survival at unmanaged sandpits.

DISCUSSION

The use of human created habitats for nesting by Least Terns has been recognized throughout their range (Hill 1993; Sidle and Kirsch 1993; Krough and Schweitzer 1999; McFarlane 2005; Boylan *et al.* 2005; Fischer *et al.* 2005) and the importance of these habitats along the central Platte River is evident from the first records of Least Tern nesting along the Platte River in central Nebraska (Wycoff 1950, 1960; Lingle 1993a). Kirsch (1996) studied the use of natural riverine sandbars and human created sandpits along the lower Platte River downstream of Columbus, Nebraska and found terns showed no preference of riverine sandbars over sandpits or visa versa. Mortality of young and productivity also did not differ between these two habitat types and it was suggested that terns may not perceive sandbars and sandpits as different (Kirsch 1996).

Measures of nest success and fledge ratios from human created habitats along the central Platte River are at the upper extent of the ranges reported from other studies for Least Terns (Gore and Kinnison 1990; Smith and Renken 1993; Brunton 1997; Kirsch and Sidle 1999; Krough and Schweitzer 1999; Dugger *et al.* 2000; Szell and Woodrey 2003). Most data from the central Platte and 80% of the nests reported in this paper were on areas managed specifically for the successful nesting of Least Terns and Piping Plovers. Management included vegetation control and predator management techniques such as predator removal and barrier fences. Predator management techniques have been hypothesized to increase Least Tern productivity in other areas (Koenen *et al.* 1996) and have been shown to be effective at increasing recruitment of Piping Plovers (Mayer and Ryan 1991; Larson *et al.* 2002), The data on productivity at managed sandpits presented in this paper was significantly higher than at unmanaged pits during the same time frame, indicating that management is effective in improving productivity of Least Terns.

Table 5. Fledge ratios for Least Terns at sites monitored along the central Platte River. Results present as fledglings per nest and fledglings per pair. A pair is defined as the maximum number of nest and broods present during a single visit.

Management type	Number nests	Number of pairs	Fledglings per nest	Fledglings per pair
Unmanaged sandpits	125	97	0.43	0.56
Managed sandpits	473	409	1.13	1.31
Managed river islands	49	47	1.04	1.09
Total	647	553	0.99	1.16

Despite observed relatively high reproductive rates, abundance of adult Least Terns counted in mid-June of each year along the central Platte River is steady to declining (Jenniges 2005). Potential reasons for this are overestimation of reproduction, low site fidelity or emigration. The unique ability to monitor these sites without disturbing the birds, small colony size and frequent visits lead us to believe our estimates of reproduction are reasonable. Lingle (1993b) found that only 29% of adult terns returned to nest at the site where they were banded and 26% of chicks returned their natal site indicating there is fairly low site fidelity and high emigration rates. Emigration from the area may even be higher now then when Lingle (1993) did his study. Sidle and Kirsch (1993) found that new sandpits were being colonized at the same rate that older sandpits were being abandoned. In 1991 there were eleven sandpits with nesting Least Terns along the Platte River from Lexington to Chapman (Sidle *et al.* 1991). By 2001 that number had declined to six sandpits (Platter River Program, unpublished 2005) with three of those six sandpits specifically managed for nesting Least Terns. The reason(s) for the decline in sandpit habitat is driven by the ability of mine operators to profit from material that once was left as spoil and which made up the nesting substrate, mine operators may also be actively eliminating potential habitat to avoid conflicts with endangered species and mining operations at active sandpits (Marcus *et al.* 2007).

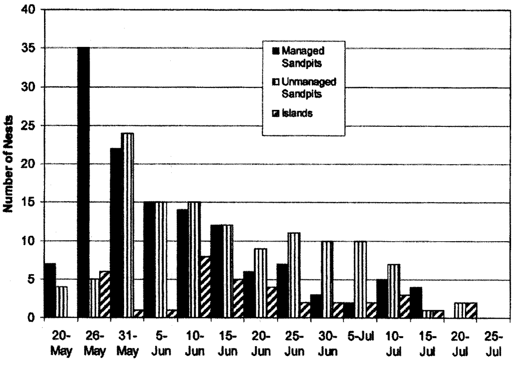

Figure 5. Nest initiation dates for Least Tern nests at managed sandpits, unmanaged sandpits and created islands 1994-1997.

The majority of nesting Least Terns are on sandpits along the central Platte River (Sidle *et al.* 1991; Sidle and Kirsch 1993; Jenniges 2005) however, the focus of habitat management remains on riverine habitat creation. The number of nests on natural river formed islands without mechanical modification; 17 nests in 1979 all flooded before fledging (Faanes 1983), 36 nests between 1985 and 1990 of which 18 hatched and produced no known fledglings (Lingle 2004) and post-1990 all but two nests have been on human created habitats with no estimate of success (Sidle *et al.* 1991; Jenniges 2005). It was assumed the lack of suitable sandbars limited the number of nesting Least Terns and led to the recommendation for construction of riverine islands to provide habitat for nesting Least Terns in the central Platte River (Zwietz *et al.* 1992; Sidle and Kirsch 1993). The Platte River Whooping Crane Maintenance Trust and Nebraska Public Power District constructed a total of six islands (Currier and Lingle 1993; Plettner 1993) with limited success in bird occupation of those islands. However, the only documented successful fledging of Least Terns from central Platte River islands comes from islands where the bare sand nesting substrate was created by some human activity such as vegetation clearing. Zweitz *et al.* (1992) concluded that channels wide enough to attract terns may be too flat to provide islands high enough to be safe from flooding and that higher islands had become vegetated, suggesting that higher flows were needed to scour vegetation off those islands. Ecological studies of riverine vegetation in the current river system found that vegetation establishes on low sandbars which then grow in elevation during subsequent high flows that deposit sediment into the vegetation but did not eliminate it (Johnson 1994). These same processes may have always been in place and thus the lack of documented successful nesting on riverine islands and the lack of historical nesting data on the central Platte River. Current management efforts that are trying to create nesting habitat through sediment manipulation and flow management need to evaluate the processes by which sandbars form, vegetate and grow in elevation as well as evaluate what Least Terns use for nesting.

Sidle and Kirsch (1993) suggested that management of Least Terns and Piping Plovers at existing sandpits should continue. The number of Least Tern chicks fledged per nesting pair on three managed sandpit areas indicates that sandpit management is one option for producing fledged chicks, but the survival of chicks after fledging needs to be further evaluated. Because new sandpits no longer offer suitable nesting habitat efforts also need to be put into to evaluating the restoration of older sandpits as nesting habitat. Relying on the aggregate mining industry to provide habitat as a by-product of their economically driven activity is no longer sufficient, if may be necessary to work with the mining industry to provide habitat if it is desired. Efforts to date at trying to create riverine habitat have had a limited success, leaving management of existing sandpits and potentially restoration of old sandpits that had nesting as the most viable short term option of increasing the number of nesting Least Tern in central Nebraska.

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