1990 SNOWY PLOVER STATUS REPORT

FISH SPRINGS NATIONAL WILDLIFE REFUGE

The snowy plover (Charadrius alexandrinus) is a small shorebird associated with saline and alkaline flats in the interior West, including Utah. It is represented by a number of subspecies, that are found throughout many areas of the world. In Utah, it is represented by the Western Snowy Plover (Charadrius alexandrinus nivosus) and is a Species of Special Concern throughout its range in western North America. It has been State-listed as THREATENED and ENDANGERED, respectively, in Oregon and Washington, but is not federally listed. In Utah, little was known about the snowy plover population until the first organized surveys in 1988. Fish Springs NWR participated in these surveys from 1988-1990, thus acquiring its first real glimpse of this migrant shorebird. Some interesting and surprising insights were gained of this species during that time.

General:

Snowy plovers arrive at Fish Springs (and Utah) around early April and depart by October. Early arrival in 1990 was April 4, with the last observation on September 25. Nesting begins about mid March, though the peak season is generally mid May to mid June. On the Refuge, hatching appears to begin around the third week of May with late hatching observed on July 28 (in 1990). These hatching dates are based on limited data, so earlier and later dates are likely, dependent on weather and other environmental conditions.

Nesting typically occurs on open alkaline flats with little or no vegetation. Salicornia is the most common, scattered vegetation near the nest site, while saltgrass (Distichlis spicata), greasewood (Sarcobatus vermiculatus) and saltbush (Atriplex spp.) usually comprises the general, surrounding area, but not the nest site. Nests usually consist of a shallow scrape in the ground and may be lined with small bits of debris, such as vegetation, mud and salt chips.

Typically, 3 eggs are laid with incubation taking about 27 days. The chicks fledge within 31 days. Male snowy plovers usually incubate the eggs at night, while the females incubate during the day. Snowy plovers are sometimes polygamous, thus the female may desert the newly hatched brood and renest with another male; thus leaving brood rearing to the male. Nothing is known of hatching success or predation rates at Fish Springs, though studies elsewhere suggest that predation rates can be substantial.

Fish Springs Population:

Prior to 1989, the population of snowy plovers was thought to be quite small. Census data rarely reported more than 12 plovers on the Refuge at any one time. In 1986, a July 29 count of 100

individuals was recorded and 80 were recorded on September 12. These are believed to be the 2 highest census counts to that date. No other information was noted with these high counts.

In early June 1989, Fish Springs participated in the statewide census of snowy plovers in Utah. In preparation for the census, a preliminary survey was conducted to determine the best locations on the Refuge to observe and census snowy plovers. This survey was conducted in the early evening and produced 88 plovers, the highest total since 1986 and much higher than any of the daytime counts conducted around that time. Subsequent census' were conducted in the late evening on June 2, then early morning and late evening of June 3. These counts produced 126, 116 and 174 plovers, respectively, plus 4 broods with 11 chicks. These high numbers of plovers were re-verified on May 28, 1989 when 151 birds were censused. This indicated that the observed plovers were probably members of a breeding or summering population and not a transient flock.

In 1990, 164 and 151 plovers were tallied, respectively, on May 24 and June 28, thus substantiating the sightings from 1989. The increase in snowy plovers may be a recent phenomenon created by the flooding of the Great Salt Lake in the early 1980's. The peak counts of plovers in 1986 correspond with the dramatic increase of white-faced ibis that same year. The latter were apparently displaced from traditional breeding grounds during the GSL flooding. Another reason for the increased plover numbers may be attributed to census timing.

Standard twice-monthly Refuge census' are generally conducted after 8 am, with suitable plover habitat reached by late morning. These census' do not always tally snowy plovers or they tally few birds. All peak counts in 1989 and 1990 were conducted within 1.5 hours after sunrise and 1.5 hours before sunset. Therefore, Refuge census' would underestimate the snowy plover population. Increased plover use during daylight hours was observed to increase later in the season, when breeding was on the decline. These birds were often congregated together at specific sites near water, with open mud or saltflats.

Observations in 1989 and 1990 suggest that the majority of the snowy plovers observed do not nest on the main part of the Refuge, i.e., inside the dike system. Census data and the lack of suitable breeding habitat support this theory. Nesting appears to occur on suitable sites outside the main dikes and into the surrounding desert. Many of the plovers probably utilize sites on adjacent military land. Observations at sunset noted small flocks of plovers leaving the Refuge and flying north into the surrounding desert. The Refuge appears to function primarily as a foraging site for the surrounding nesting snowy plovers. Plovers forage primarily around water edges, as their diet consists of a variety of aquatic-based invertebrates. Low numbers of plovers nest on the Refuge and they are probably influenced by the amount of available nesting areas in any

specific year. Marsh drawdown activities appear to have increased on-Refuge nesting.

Observations Versus Timing

The early morning and late evening peak counts correspond with the timing for nest duty changeovers. Rough estimates of the sex ratio during peak counts shows that up to 75% are males, though this aspect needs to be further verified. Typically, snowy plover populations consist of a higher proportion of males, which serves as a source of new mates for the polygamous females, that have "abandoned" their broods. The high proportion of males noted may also correspond to the pattern and timing of nest duty changes, since males usually incubate at night and females during the day. Increased feeding activity would be expected of males that have just finished incubating. Studies have shown that the non-incubating adult typically will remain in the vicinity of the nest. This would account for the lack of sightings during the day, since most plovers apparently nest off the visible portion of the Refuge.

As stated earlier, late season counts tallied an increased number of daytime snowy plovers. These birds were apparently finished breeding and more intent on refueling for their southward migration, thus remaining within the Refuge impoundments. As of yet, there has been no observations of significant pre-migration staging, though most plovers have appeared to leave the Refuge about the same time.

Observations Versus Weather

Weather appears to be correlated with plover sightings. Precipitation, whether low or high amounts, serves to fill many ephemeral desert pools. The filling of ephemeral pools would create an abundance of foraging sites throughout the surrounding desert, and thus, the presumed nesting areas. Observations show a dramatic decline in Refuge foraging during these periods. On May 24, 111 plovers were observed along a seep area in Harrison Unit, with 164 total for the Refuge. Three days of light rain (0.29") occurred from the 28th to the 30th. A subsequent count on May 30 produced less than 12 birds along this seep, though this had been a highly favored site for about 2 weeks prior to the rain. Few birds were observed elsewhere on the Refuge.

As the ephemeral pools dry, plover use increases. Refuge impoundments also start drying considerably during the summer, starting in May. This substantially increases the amount of foraging habitat available to the plovers, as well as increasing the difficulty in censusing, as birds spread out.

Weather is expected to play a considerable role in snowy plover utilization on and around the Refuge, with the Refuge's importance increasing during hot, dry periods.

Snowy Plover Habitat on the Refuge

Available plover habitat is greatly influenced by water levels. During the major part of the breeding season, most areas are inundated with water, thus providing few nesting areas. For this reason, most nesting occurs outside of the diked portions of the Refuge.

Gadwall Unit contains the bulk of preferred plover foraging habitat and the most suitable nesting habitat. Most sightings occur here, particularly along the eastern shoreline and northern dike. Nesting probably occurs adjacent to this area, but outside of the dike system. The majority of broods are observed here. This unit is extremely alkaline, shallow and dries quickly, therefore exposing suitable shoreline early in the season. Its location in the northeast corner of the Refuge makes it the nearest impoundment to the suspected nesting areas of the surrounding desert. Overall, this is the most consistently utilized impoundment on the Refuge.

The Refuge started a schedule of impoundment drawdowns in 1988. Those units that have been artificially lowered early in the season have added important foraging areas, as well as some limited increase in plover nesting. Shoveler Unit was drawndown in 1988-89 and attracted a fairly large and punctual group of birds. These birds almost exclusively utilized the eastern portion of the impoundment where seepage maintained shallow water in the slough. Birds particularly concentrated in a small muddy area with a high interspersion of surface mud and water puddles. This area was also used extensively by other breeding shorebirds, such as avocets and stilts. One plover nest was documented on this unit.

In 1990, Egret and Harrison Units were drawndown. Harrison Unit maintained some seepage from the inner slough through early June. This seep area, like Shoveler Unit in 1989, contained a myriad of surface mud and water puddles. Plover use on Egret Unit was confined to the eastern side, as this area maintained some shallow water. Both of these areas were also utilized by avocets. Snowy plover use on these 2 units was quite extensive, with concentrations rivaling or exceeding concentrations on Gadwall Unit. Broods were observed on all of the mentioned drawdown units. Impoundment drawdowns appear to have a positive effect on the overall snowy plover population. The incorporation of drawdowns as a component of snowy plover management needs to be investigated.

All remaining impoundments dry considerably during the summer, exposing numerous mudflats and shoreline. Snowy plovers have been observed in all units later in the season. Most of these observations appear to be of post-breeding activity.

Snowy Plover Production

The on-Refuge breeding population is unknown. Nests are difficult to locate and staff-time is not available to perform extensive nest searches. Brood observations averaged around 12 for both 1989 and 1990. These observations do not reflect the total breeding population, as nesting success, double clutching and brood mortality are unknown. Chicks grow rapidly, thus locating all possible broods would be extremely time consuming considering the wide breeding window of this species. In estimating production, the influence of off-Refuge nesters and broods would need to be considered. Water levels and drawdowns will have a significant impact on Refuge nesting.
Judging from the peak counts and rough sex ratios obtained over the past 2 years, there are probably up to 75 pairs nesting in the general vicinity of Fish Springs.

Snowy Plover Management

The snowy plovers status as a Species of Special Concern and potentially a THREATENED species dictates that the Refuge address management practices influencing the plovers. The statewide census' conducted under the Utah Department of Natural Resources, Division of Wildlife reflects the need for data concerning management of the plover. Data from these census' indicates that the Fish Springs area may support one of the single largest concentrations of plovers in the state per unit area. The importance of the Refuge to this population, particularly as foraging habitat, cannot be overlooked.

The need for baseline data on the snowy plover is essential, should the bird be listed as THREATENED under the Endangered Species Act. Any biological study should incorporate the entire breeding population, both on- and off-Refuge. This is essential since the off-Refuge breeders appear to rely heavily on the Refuge for foraging, particularly during the driest portions of the summer. A cooperative agreement of some type may be needed since many of the plovers appear to be nesting on U.S. Army lands.