

Black Tern

(*Chlidonias niger*)

Legal Status

Federal: None

State: Species of Special Concern



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Global and State Conservation Status: G4S2: Global rank, G4 = Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors; State rank, S2 = Imperiled: Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.

Recovery Plan: None

Species Description and Life History

Black terns (*Chlidonias niger*) are short to medium-distance migrants that nest primarily in the western Great Plains of the United States and, and winter in California, Arizona, New Mexico and northern Mexico (Dunn and Agro 1995). During the breeding season, Black Terns are primarily black and gray with white undertail coverts.

Seasonal Patterns

In California, black terns arrive from their South American wintering grounds in late April through mid-May. Fall migration may begin as early as late July with a peak from mid-August until mid-September, with a few birds lingering as late as October (Dunn and Agro 1995).

Reproduction

Both males and females build cup nests consisting of marsh vegetation on floating mats of dead vegetation, muskrat lodges, islands, and even on artificial platforms or floating cow dung (Shuford 2008, Shealer *et al.* 2006). Females initiate egg laying in mid-May and a clutch typically comprises three eggs. Both parents incubate the eggs until they hatch in 19 to 22 days, and both feed nestlings for about 18 days (Dunn and Agro 1995). Eggs are adapted to damp conditions by having more pores than eggs of similar mass, and these pores allow more water vapor conductance thereby ensuring proper regulation of temperature of damp or wet eggs (Davis and Ackerman 1985).

Home Range/Territory Size

Black terns are semicolonial nesters, especially in productive foraging areas, and nest clusters range from about 10 to 50 nests. Most nests are 5 to 20 m apart, but they can be placed within 1 m of each other (Dunn and Agro 1995).

Foraging Behavior and Diet

The diet of black terns in California has not been studied (Shuford 2008). However, they are documented to be primarily insectivorous during the breeding season in other regions, but also consume small fish when available (Dunn and Agro 1995). The primary insect prey are damselflies and dragonflies (Odonata), but terns also consume mayflies (Ephemeroptera), caddisflies (Trichoptera), beetles (Coleoptera), moths (Lepidoptera), dipterans, grasshoppers, crickets, and locusts (Orthoptera), water scorpions (Hemiptera), spiders (Araneida), grubs and larvae, amphipods, crayfish, and small mollusks (Dunn and Agro 1995, Gilbert and Servello 2005).

Habitat Requirements and Ecology

Nesting

In California, Black Terns are restricted to flooded rice fields and freshwater marshes, including lakes and ponds with marsh edges when breeding (Shuford *et al.* 2001). They nest mostly on floating mats of vegetation in marsh areas surrounded by emergent vegetation, presumably as a buffer to wind and wave action (Bergman *et al.* 1970, Dunn and Agro 1995). In the Central Valley, most Black Terns nest in rice fields, especially with small islands (dirt mounds), although they formerly nested in ephemeral seasonal marshes created from flood events (Shuford *et al.* 2001). They tend to select nest sites in freshwater marshes with tall sparse vegetation or short dense vegetation (Naugle *et al.* 2000). They also build nests closer to the water surface (2-4 cm above water) than Forster's terns (*Sterna forsteri*) (average of 21 cm), and were not considered to compete with Forster's terns for nest sites (Bergman *et al.* 1970).

Black terns are generally considered to be an area-dependent species that require marshes >5 ha (12.4 acres) within marsh complexes or isolated marshes >11 ha (27.2 acres) (Brown and Dinsmore 1986). In the Great Plains, they require large landscapes of wetland complexes and upland habitats, and tend to nest in larger wetlands of regenerating or degenerating vegetation within high density areas of wetlands and near untilled upland grasslands (Naugle *et al.* 2000). Although this study is not directly comparable to the Sacramento Valley because of the difference in habitats—freshwater marsh vs flooded rice fields, the importance of landscape-level factors is probably similar.

Foraging

Black terns forage near their nesting sites using low, circling flight with shallow wingbeats and bills pointing downward. They sometimes forage from perches over water. They may catch large insects in midair, especially dragonflies (Dunn and Agro 1995).

Species Distribution and Population Trends*Distribution*

Black terns breed throughout much of the United States east of the Rocky Mountains, and in scattered locations in the western states, including California, and in southern Mexico and the Greater Antilles (except for Cuba), and possibly in Columbia and Ecuador. They winter primarily in the nearshore of the Pacific Ocean and the Caribbean Sea off the coasts of Mexico, Central America, and South America (Dunn and Agro 1995).

In California, black terns breed in isolated sites in the Central Valley, Klamath Basin and the Modoc Plateau (Shuford *et al.* 2001, Shuford 2008). Due to lack of suitable freshwater habitat in most national wildlife refuges and state wildlife areas during the summer, black tern breeding sites in the Sacramento Valley are primarily flooded rice fields. These rice fields supported 90% of the Central Valley breeding population during surveys in 1997 and 1998 (Shuford *et al.* 2001).

Population Trends

Declines in numbers of the Black Tern in California are a result of habitat loss, especially the widespread loss of freshwater marshes. Breeding Bird Survey data reveal a steady, significant decline over the species' range from 1966 - 1992 (National Biological Service data *in* Dunn and Agro 1995), however, these data are inadequate to provide a trend assessment for California (Sauer *et al.* 2005, Shuford 2008).

Distribution and Population Trends in the Plan Area

While black terns probably nested historically throughout the vast wetlands in the eastern part of Yolo County, there have been no recent nesting records in the Plan Area (Yolo Audubon Society Checklist Committee 2004). However, presumed migrants can often be observed foraging over flooded rice fields in the Yolo Bypass, especially from the eastern end of County Road 25, where it meets the levee, usually from late April until mid-May (Beedy pers. obs.). They are also often seen foraging over sewage treatment ponds (Holstein per obs).

Threats to the Species and Other Conservation Issues

There are currently few major threats to this species. However, because black terns have such a limited distribution and are dependent upon flooded rice fields for breeding in the

Sacramento Valley, conversion of rice fields to other crops such as cotton or to dry land rice would pose a significant threat to the Yolo County migrant population. Water management of these rice fields must also be sensitive to the needs of breeding terns. Rapid lowering of water levels in rice fields may expose nests to mammalian predators, and subsequent rising of water levels may drown re-nesting attempts (Lee 1984 *cited in* Shuford *et al.* 2001, Gilbert and Servello 2005). Effects from exposure to pesticides in rice fields should be investigated, but previous studies outside California have found no ill effects on eggs or development of young (Dunn and Agro 1995, Weseloh *et al.* 1997 *cited in* Shuford *et al.* 2001). Pesticides likely reduce populations of insect prey. Adult black terns are also susceptible to botulism outbreaks (Manuwal 1967).

Significant data gaps relating to many aspects of the ecology of the black tern exist. Data gaps include sources of mortality, effects of pesticides as well as diet and foraging ecology. Many large rice land areas in the Central Valley appear to be unoccupied, but apparently represent suitable habitat for black terns.

Agricultural Species Use Zones

The black tern model above indicates where suitable habitat in agricultural lands occurs as they are currently mapped (2007). However, because the agricultural landscape is very dynamic and the location of agricultural uses may change significantly from year to year and in some cases seasonally due to growth and harvesting regimes and occasional double-cropping, it is important to also identify general agricultural species use zones. Agricultural species use zones (see Figure 2) show areas where, if the appropriate agricultural type is present, then the habitat will be suitable for that species.

- Rice Field Complex Zone: This species use zone was modeled by selecting all areas within the Central Valley and Yolo Bypass ecoregions. Rice fields that occur in this zone and meet the spatial criteria described above for this habitat type could provide suitable habitat for this species.
- Isolated Rice Field Patch Zone: This species use zone was modeled by selecting all areas within the Central Valley and Yolo Bypass ecoregions. Rice fields that occur in this zone and meet the spatial criteria described above for this habitat type could provide suitable habitat for this species.

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References

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