

Least Bittern

(*Ixobrychus exilis*)



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Legal Status

Federal: None

State: Species of Special Concern

Global and State Conservation Status: G5S1: Global rank, G5 = Secure: Common; widespread and abundant; State rank, S1 = Critically Imperiled: Critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.

Recovery Plan: None

Species Description and Life History

Description

The least bittern (*Ixobrychus exilis*) is a very small heron with a total size of 28-36 cm (11-14 inches) and a wingspan of 41-46 cm (16-18 inches). Found exclusively in freshwater or brackish marshes with tall emergent vegetation, this inconspicuous heron has a long neck and bill, black or dark brown crown and back, orange-brown sides, and the front of the neck and chest striped orange and white. Its bill is yellow with a dark upper edge, eyes yellow, and legs green in front and yellow behind (Gibbs *et al.* 1992).

Seasonal Patterns

Least bitterns are medium-distance migrants that nest primarily in the United States and winter in Mexico and Central America (Eckerle and Thompson 2001). Arriving on their breeding grounds in April or May, the breeding season extends through approximately mid- to late-June. This species sometimes forms loose colonies, but also breeds as isolated pairs (Gibbs *et al.* 1992). Migration begins approximately late August through September, but in California the species may be non-migratory (Gibbs *et al.* 1992).

Reproduction

Least bitterns are monogamous. Males build nests in dead, or new, emergent vegetation over water. The nests are usually 15–76 cm (6–30 inches) above water that is 8–96 cm (3–38) deep, and within 10 m (33 feet) from open water or channels (Gibbs *et al.* 1992,

Kushlan 1973). They initiate egg laying within a few days after nest construction is complete and a clutch typically comprises 4-5 eggs. Females incubate the eggs for 17-20 days until they hatch asynchronously for 2-4 days. Independence occurs after 13 to 15 days (Gibbs *et al.* 1992); however, Bogner and Baldassarre (2002) found that mean age at first flight was about 29 days ($n = 4$).

Home Range/Territory Size

Limited information is available on least bittern home range sizes. A recent study in western New York found mean home range of adults was 9.7 ha (23.9 acres) ($n = 33$), but was variable (range = 1.8–35.7 ha [4.4 – 88.2 acres]) (Bogner and Baldassarre 2002).

Across the North America range, breeding density estimates range from 0.4-15.0 territorial males or nests per ha (Gibbs *et al.* 1992).

Foraging Behavior and Diet

Least bitterns forage primarily from dense emergent vegetation along deep (25-60 cm [10–24 inches), open waters by stalking prey near the surface of water (Gibbs *et al.* 1992). They build foraging platforms of reeds at productive feeding sites and use them during late-incubation and brood-rearing periods (Weller 1961). They prey upon small fish, such as catfish, minnows, eels, sunfish, killifish, and perch, but will also eat frogs, tadpoles, salamanders, leeches, slugs, crayfish, small snakes, aquatic insects, and, occasionally, shrews and mice (Gibbs *et al.* 1992, Kaufmann 1996).

Habitat Requirements and Ecology

In California, least bitterns are found year-round, but their winter distribution and status is not well known. Least bitterns are restricted to breeding in freshwater marshes with dense stands of tule, cattail, bulrush (Gibbs *et al.* 1992, Sterling 2008). Vegetational structure and composition and marsh size appear to be important factors to consider when managing for least bittern populations (Bogner and Baldassarre 2002). Water is an important parameter for successful nest sites, as marshes with dry cattails and bulrushes are avoided. Least bitterns have been found to be most abundant in marshes with an equal amount of open water and dense emergent vegetation (Gibbs *et al.* 1992). As with other marsh birds, if water levels are allowed to drop due to evaporation or water diversion, then nesting colonies can be abandoned or otherwise fail due to loss of prey and increased access to mammalian predators. In Iowa, occupied marshes were generally larger than five acres; however, wetlands as small as 0.2 ha (0.4 acres) have been documented (Gibbs *et al.* 1992). Given the mean territory size calculated by Bogner and Baldassarre (2002), five acres may be regarded as the minimum patch size for this species.

Species Distribution and Population Trends

Distribution

Least bitterns breed throughout much of the interior western United States and winter in Mexico and a few locations in California (Gibbs *et al.* 1992, Sterling 2008). Gibbs *et al.* (1992) consider the breeding distribution in California to include the northern San Joaquin Valley and southern Sacramento Valley, and portions of southern California. There are also a few disjunct breeding records from Honey Lake in Lassen County and Billy Lake in Inyo County (Kirk 1995). In California, least bitterns winter in isolated sites in the Central Valley and Delta Region, as well as the Lower Colorado River Valley and the Imperial Valley (Sterling 2008, Rosenberg *et al.* 1991, Patten *et al.* 2003).

Population Trends

Because the species is secretive, its local abundance is difficult to ascertain and numbers of individual least bitterns are likely underestimated, especially during the winter when they rarely vocalize (Grinnell and Miller 1944, Gibbs *et al.* 1992). Range-wide surveys, such as the U.S. Fish and Wildlife Service's Breeding Bird Survey (BBS) Routes are inclusive due to the secretive nature of the bird. Populations are presumed to have declined and continue to decline range-wide as a result of widespread destruction of marsh habitats.

Habitat loss is also attributed to presumed widespread population declines in California. However, because there were no estimates of historical population levels, the extent of population declines is not fully understood.

Distribution and Population Trends in the Plan Area

Least bitterns have been found in recent years in Yolo County and have been presumed or documented breeding in 1999, 2003, 2004, and 2007 (Sterling 2003, J. Sterling pers. obs., Yolo Audubon Society 2004, Steve Hampton at <http://www.geocities.com/rainforest/canopy/6181/yolo.html>). The species was detected in 1999 and again in 2003 at Conaway Ranch and is presumed extant. An additional breeding location from 2003 and 2004 was recorded at the end of County Road 31; however, this location is no longer considered extant due to scouring of marsh vegetation as part of canal maintenance. The 2007 breeding location was in the Yolo Bypass Wildlife Area. This site, apparently supporting 1 to 2 breeding pairs, will presumably be maintained and protected by the California Department of Fish and Game.

Potentially suitable habitat in Yolo County is limited to various locations in the Yolo Basin, including the Yolo Bypass Wildlife Area, portions of the southern panhandle, Conaway Ranch, and the Davis Wetlands. Additional potential habitat may develop at the Roosevelt Ranch Preserve north of Woodland.

Threats to the Species and Other Conservation Issues

The primary threat to least bitterns is loss and degradation of emergent cattail and bulrush marshes in the Central Valley. An increasing threat comes from invasive species of vegetation that degrade habitat, such as purple loosestrife (*Lythrum salicaria*) and common reed (*Phragmites australis*) (Gibbs *et al.* 1992). At some state and federal wildlife refuges, management of marsh habitat for breeding waterfowl is currently on a four-year cycle, which precludes the development of large stands of suitable bittern nesting habitat by calling for the removal of vegetation once it reaches 70% cover (J. Fulton pers. comm.). Water contamination could threaten bitterns directly through poisoning or indirectly by reducing the availability of their prey. Storm water runoff and other polluted water may also increase exposure to *Eustrongilides*, a nematode parasite found in small fish, which could potentially devastate bittern populations (Gibbs *et al.* 1992).

Significant data gaps relating to many aspects of the ecology of the least bittern exist. Data gaps include minimum patch size for successful breeding colonies, parameters of population sinks, sources of mortality, foraging ecology, site fidelity, as well as winter distribution and ecology in the Central Valley and Yolo County.

Many wetland areas in the Central Valley appear to be unoccupied, but apparently represent suitable habitat for least bittern (Sterling 2008). In addition, factors determining local population fluctuations need to be fully understood in order to guide effective management actions to increase and stabilize populations at local carrying capacity.

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