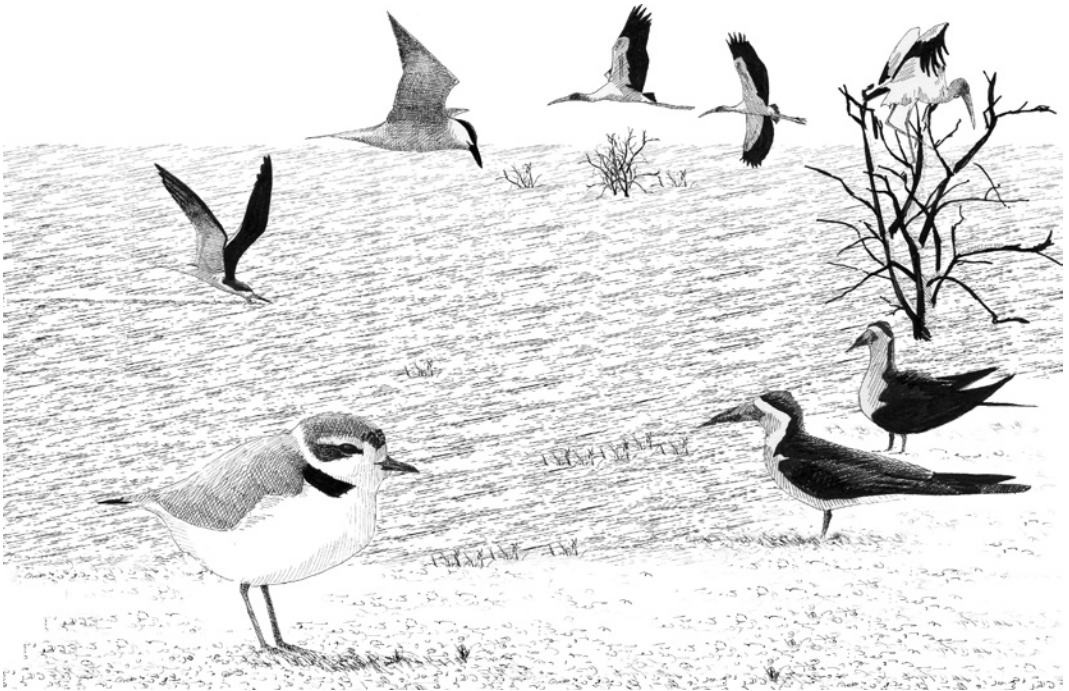


II

SPECIES ACCOUNTS



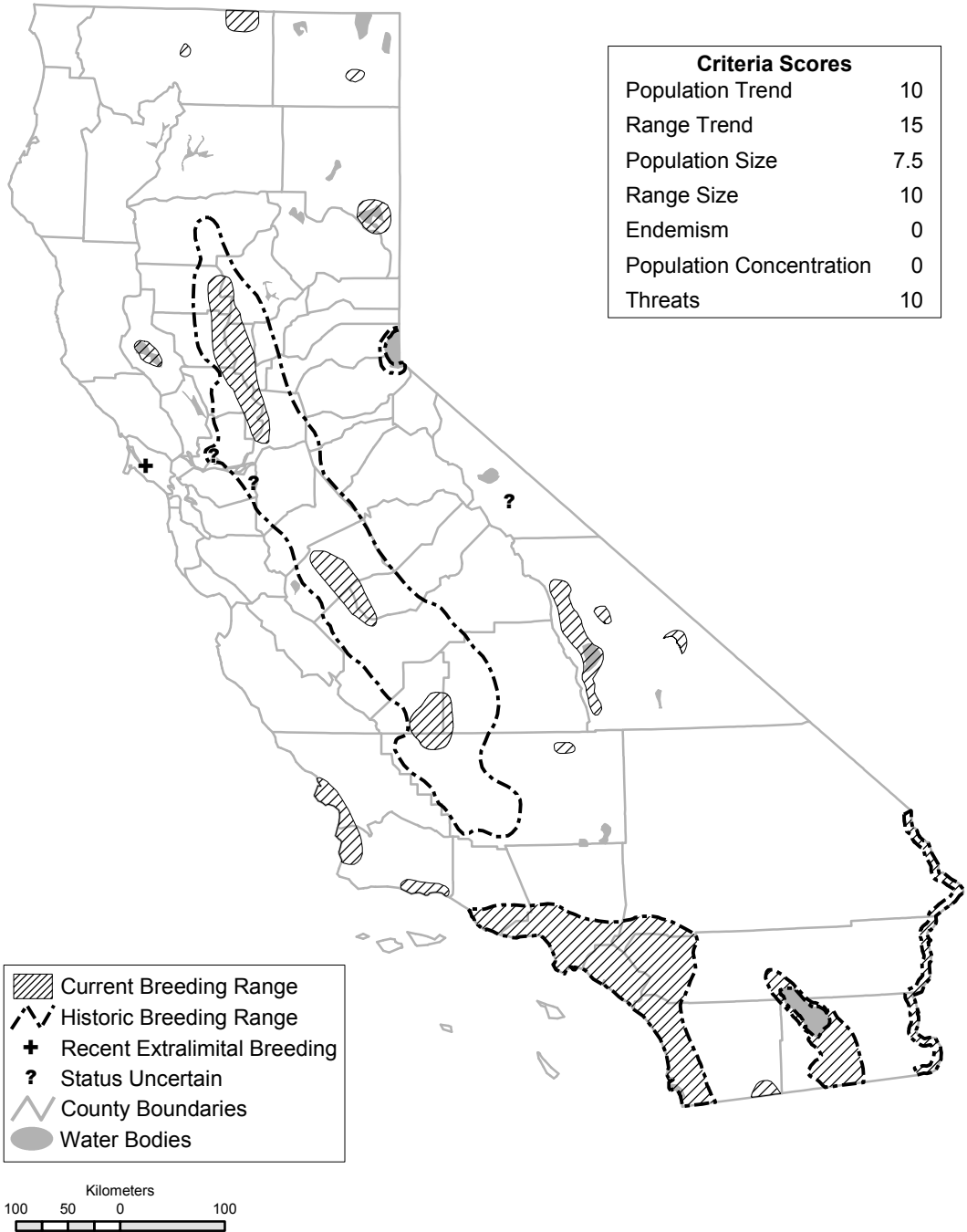
Andy Birch

PDF of Least Bittern account from:

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LEAST BITTERN (*Ixobrychus exilis*)

JOHN STERLING



Current and historic (ca. 1944) breeding range of the Least Bittern in California; numbers have declined at least moderately and the range has retracted greatly in the Central Valley. These bitterns occur irregularly within the mapped range in Siskiyou, Modoc, and Lassen counties. Birds retreat from northern areas in winter but are resident on the coastal slope of southern California, in the Salton Sea area, and along the lower Colorado River. They occur away from breeding areas locally during migration, postbreeding dispersal, and winter.

SPECIAL CONCERN PRIORITY

Currently considered a Bird Species of Special Concern (breeding), priority 2. Included on the list since its inception (Remsen 1978, 3rd priority; CDFG 1992).

BREEDING BIRD SURVEY STATISTICS FOR CALIFORNIA

Data inadequate for trend assessment (Sauer et al. 2005).

GENERAL RANGE AND ABUNDANCE

Breeds very locally in marshes in the western United States and throughout much of the eastern United States, the Caribbean, and parts of Mexico and northern Central America (Gibbs et al. 1992). Although most birds in the United States migrate to winter in the neotropics, some remain through the winter in southern regions, from the coastal plain of Maryland south to Florida, in southern and coastal Texas, and in southern California, especially in the Salton Sink and the lower Colorado River valley (Rosenberg et al. 1991, Gibbs et al. 1992, Patten et al. 2003). Because the species is secretive, its local abundance is difficult to ascertain and is likely underestimated, especially during the winter, when it rarely vocalizes (Grinnell and Miller 1944, Gibbs et al. 1992). Across the North American range, breeding density estimates range from 0.4 to 15.0 territorial males or nests per ha (Gibbs et al. 1992).

SEASONAL STATUS IN CALIFORNIA

Primarily a summer resident in California, with at least some remaining during the winter in the Salton Sink, the lower Colorado River valley, and coastal Orange and San Diego counties (Garrett and Dunn 1981, Rosenberg et al. 1991, Hamilton and Willick 1996, Patten et al. 2003, Unitt 2004). It is unclear whether the paucity of winter records for northern California indicates rarity or the species' silence and secretive habits during this season (Moffitt 1939, McCaskie et al. 1979, MPCR files). In southern California, populations increase from mid-March to mid-April and decrease from late September to mid-October (Garrett and Dunn 1981, Patten et al. 2003). That most spring records are from May and early June in locations where bitterns are not known to winter regularly (see map) suggests that spring migration is later in these areas (Gaines 1992, Lehman 1994, Heindel 2000, Roberson 2002). The breeding season extends from May through August (Gibbs et al. 1992, Kirk 1995).

HISTORIC RANGE AND ABUNDANCE IN CALIFORNIA

Grinnell and Miller (1944) described the Least Bittern's breeding abundance in California as "doubtless fairly common." But they acknowledged that its secretive habits veiled its relative abundance and also likely the full extent of its breeding distribution. Still, they described the range as primarily the Sacramento and San Joaquin valleys and coastal southern California.

Northeastern California. Historic breeding season records are of nests at Eagle Lake, Lassen County (CAS #1119), and at Lake Tahoe, El Dorado County (Orr and Moffitt 1971), and specimens from Red Rock, Lassen County (CAS #72870), and the mouth of Rush Creek at Mono Lake, Mono County (Grinnell and Storer 1924, MVZ #26698).

Central coast. Historic breeding season records are from Lake County (presumably Clear Lake; CAS #19071, 19072); Del Mar Pond, Santa Cruz County (R. Hansen pers. comm.); Golden Gate Park, San Francisco County (Grinnell and Wythe 1927); and "Los Osos Lake," San Luis Obispo County (1932 egg set fide T. Edell).

Central Valley. Historic breeding season records are from near Pennington, Sutter County (Moffitt 1939); Colusa, Colusa County (CAS #72868); Stockton, San Joaquin County; near Merced, Dos Palos, and Los Banos, Merced County; Whitesbridge and Mendota, Fresno County; Tulare Lake, Kings County; and Buena Vista Lake, Kern County (Grinnell and Miller 1944, R. Hansen pers. comm.). Indicative of the former abundance of this species in the Los Banos area, Merced County, are 36 specimens collected there by Rollo Beck from May to August 1908 (CAS specimens). By contrast, Tyler (1913) considered the Least Bittern to be scarce in Fresno County.

Southern coast. Historical breeding season records are from Port Hueneme, Ventura County; Nigger Slough (Harbor Lake), Los Angeles County; near Redlands and Chino, San Bernardino County; San Jacinto (Mystic) Lake, Riverside County; and San Onofre, San Luis Rey (Libby Lake), and Lake Hodges, San Diego County (Grinnell and Miller 1944, MVZ specimens, WFVZ egg set data). Willett (1933) described the species as "fairly common" in summer on the coastal slope of southern California. Indicative of its local abundance were seven nests found at San Jacinto (Mystic) Lake 27–28 May 1911 (Willett and Jay 1911).

Southern deserts. It is unclear whether an early May record from Death Valley in the Mojave

Desert represented a breeder or migrant (Grinnell and Miller 1944). The Salton Sea was formed during a brief period in the early 20th century when floodwaters broke through infrastructure designed to bring irrigation waters from the Colorado River to the Imperial Valley. Indicative of historic abundance of breeding bitterns near the Salton Sea was the collection of 24 specimens at a single duck club 8 mi northwest of Calipatria, Imperial County, 7–20 May 1937 (MVZ #71296–71319). Grinnell and Miller (1944) considered the species to occur “locally or casually” to the lower Colorado River, though Grinnell (1914) failed to find this species along the river during three months of bird surveys (mid-Feb to mid-May) in 1910. This was shortly after the completion of the Laguna Dam in 1909, and before marsh habitat developed 10–11 years later. The construction of diversion dams in 1909, 1938, 1939, and 1942 enabled appropriate marsh habitat to develop along certain stretches of the river (Rosenberg et al. 1991).

RECENT RANGE AND ABUNDANCE IN CALIFORNIA

Because of this species’ secretive nature, it is difficult to assess changes in its abundance and distribution in California. Although the Least Bittern has been found more widely in recent decades (see map), this appears primarily to reflect an increase in observer coverage rather than an expansion of its range. In fact, the main pattern has been one of population decline coupled with a retraction of the range in the Central Valley and local extirpation elsewhere, particularly along the southern coast. These declines, which appear particularly severe in the San Joaquin Valley, reflect loss of freshwater marsh habitat throughout the state since 1945. Remaining core population centers are in the Sacramento Valley, the Salton Sink, and the lower Colorado River valley. Within these regions, only a few sites support the bulk of the population. There are also numerous records of individuals and small populations in many other lowland regions; some records probably represent nonbreeding migrants or vagrants. For the following records, years are provided for locations where the species is not known or suspected to occur annually.

Northeastern California. The recent breeding season records for this region are from Lower Klamath NWR (1975 and 1980), Grenada (1978), and Lava Lakes Nature Center (1980–1985),

Siskiyou County; Modoc NWR (1974 and 1991), Modoc County; and Honey Lake WA (1971) and Jay Dow Wetlands (1991), Lassen County (Radke et al. 1996; MPCR files; E. C. Bloom, T. Manolis, and L. Oring pers. comms.). Least Bitterns are probably very rare in this region, as indicated by only one found at Jay Dow Wetlands despite many bird surveys during multiyear research projects (L. Oring pers. comm.), and only two found at Modoc NWR over many years of breeding season waterfowl and crane surveys (Radke et al. 1996). Likewise, at the southern end of this region there are only a few breeding season records: Dechambeau Ponds, June Lake, and Little Alkali Lake, Mono County (Gaines 1992, Shuford and Metropulos 1996).

Central coast. Recent breeding season records are from Clear Lake State Park (1974, 2001, and 2004) and Rodman Slough (“1960s” and 1988), Lake County (J. White pers. comm.); Olema Marsh (1998, FN 52:499), Marin County; Half Moon Bay, San Mateo County (1991); Capitola (1961) and Santa Cruz Swamp (1955), Santa Cruz County; and Oso Flaco Lake and Laguna Lake, San Luis Obispo County (MPCR files, T. Edell in litt.).

The breeding status of a Least Bittern on the north coast at Arcata Marsh, Humboldt County, 7–17 July 1986 (Harris 2005) is uncertain. If representative of a breeding attempt, it would best be considered an extralimital one, as no Least Bitterns were recorded during the 1995–1999 Humboldt County breeding bird atlas (Hunter et al. 2005).

Central Valley. Recent breeding season records for the Sacramento Valley are from Sacramento NWR, Glenn and Colusa counties; near Lurline Rd. and Colusa NWR, Colusa County; Little Chico Creek, the Butte Sink, and Gray Lodge WA, Butte County; Sutter NWR, Sutter County; and the Yolo Bypass, Yolo County (MPCR files, Sterling 2003). Records for the Sacramento–San Joaquin River Delta are from near Freepoint, Sacramento County, and Palm Tract (2001), Contra Costa County, and for the Suisun Marsh from Joice Island, Solano County (MPCR files, J. Winter in litt.). Recent breeding season records from the San Joaquin Valley are from Mendota, Fresno County; South Wilbur Flood Area, Kings County; near Waukena, Tulare County; and Kern NWR, Kern County (MPCR files, B. Deuel pers. comm., R. Hansen pers. comm., J. Sterling pers. obs.). There are very few records from San Luis and Merced NWRs, Merced County, during the past

20 years, and there is no information regarding past abundance (J. Fulton pers. comm., MPCR files). There are likely more bittern breeding locations in the many private duck clubs throughout the region that have not been surveyed.

Southern coast. Small numbers of Least Bitterns are very patchily distributed as breeders in this region. Recent breeding season records are from Port Hueneme and Lake Casitas, Ventura County; Machado Lake in Ken Malloy Harbor Regional Park, El Dorado Park, and Whittier Narrows, Los Angeles County; Caspers Regional Park, Laguna Lakes, Santa Ana River at Victoria/Hamilton Bridge, and San Joaquin Marsh, Orange County; Vandenberg Air Force Base, Lake Los Carneros, Laguna Blanca, and Santa Barbara Bird Refuge, Santa Barbara County; and O'Neill Lake on Camp Pendleton, San Diego River between Santee and Lakeside, Lake Murray, Guajome Lake, San Elijo Lagoon, Batiqitos Lagoon, Buena Vista Lagoon, Discovery Lake, near the Sweetwater River at Desha, and Mission Valley, San Diego County (Garrett and Dunn 1981, Lehman 1994, Gallagher 1997, Fahy 1999, Unitt 2004, and K. Garrett, M. Long, and W. Wehtje pers. comms.).

Southern deserts. Least Bitterns breed in very small numbers in the few areas of appropriate habitat in the Owens Valley and Mojave Desert. Recent breeding season records are from Nik and Nik Gravel Ponds, Bishop Sewage Ponds, Tinemaha Reservoir, Billy Lake, Cottonwood Marsh at Owens Lake, Saline Valley (AB 29:1030), and Furnace Creek Ranch in Death Valley (possibly only migrants), Inyo County; California City (possibly only migrants) and at Prince Pond in the South Fork Kern River Valley, Kern County (Garrett and Dunn 1981, Kirk 1995, and T. & J. Heindel, J. Wilson, and B. Barnes pers. comms.). These bitterns are inexplicably absent from seemingly appropriate habitat at the Piute Ponds in the Antelope Valley, Los Angeles County (K. Garrett pers. comm.).

During the breeding season, Least Bitterns are regarded as "fairly common" in the Salton Sea area (Patten et al. 2003) and "locally common" along the lower Colorado River valley (Rosenberg et al. 1991). Recent breeding season records for the Salton Sink are from the Whitewater River mouth at the north end of the Salton Sea, Riverside County, and the south end of the Salton Sea, Finney-Ramer Unit of Imperial WA, and Fig Lagoon near Seeley, Imperial County (Patten et al. 2003, G. McCaskie pers. comm.). Along the lower Colorado River, the largest numbers

on the California side are in extensive cattail or bulrush marshes near Imperial Dam, Imperial County. In some marshes along this river, breeding density was estimated at one calling bird per ha (Rosenberg et al. 1991, W. Hunter pers. comm.); much of the habitat, however, is on the Arizona side (e.g., Topock Marsh and much of Imperial NWR).

ECOLOGICAL REQUIREMENTS

Suitable breeding habitats for Least Bitterns include freshwater and brackish marshes with tall, dense emergent vegetation and clumps of woody plants over deep water (Gibbs et al. 1992). Although the bitterns may require fairly large marshes for breeding, this is uncertain because it has not been formally studied (C. Conway pers. comm.). At Santee Lakes, San Diego County, in 2006, Least Bitterns nested in a patch of *Typha* 37 m long by 4 m wide (at its widest) and in another patch of *Typha*, with some *Scirpus* intermixed, 76 m long by 15 m wide (L. Comrack in litt.). Of the marsh cover types on the lower Colorado River defined by Anderson et al. (1984), suitable Least Bittern habitat generally corresponds to the following structural types in order of importance: V (50%–75% cattail/bulrush, many trees and grasses interspersed), I (nearly 100% cattail/bulrush, small amounts of *Phragmites* and open water), II (nearly 75% cattail/bulrush, many trees and grasses interspersed), and III (25%–50% cattail/bulrush; some *Phragmites*, open water, trees, and grasses). Nevertheless, Least Bitterns have been observed in all marsh types in the lower Colorado River valley (W. Hunter pers. comm.). They can occur in smaller numbers in sparse cattail/bulrush stands or in dense *Phragmites* stands; however, monotypic stands of *Phragmites* are generally avoided by breeding bitterns (W. Hunter pers. comm.). In the Salton Sea area, most bitterns reside in freshwater marshes in managed impoundments, along rivers or canals sustained by agricultural wastewater, and on lake edges; they are found particularly in dense stands of cattails but also in Common Reed (*Phragmites australis*) and even dense tamarisk (*Tamarix* spp.) if cattail is nearby (Patten et al. 2003). At Billy Lake in the Owens Valley, with nearly equal parts open water and emergent vegetation, Least Bitterns breed mainly in "islands" of cattails surrounded by water (Kirk 1995).

Bitterns can tolerate water levels up to 0.6 m in depth, reflecting their ability to place nests up

to 0.75 m above water and to forage by perching on vegetation well above water level (Gibbs et al. 1992). Annual fluctuations in water depth and residual marsh vegetation may be important factors in determining habitat use by Least Bitterns. However, they may withstand large fluctuations in water levels during the breeding season as long as sites do not dry out completely or rising waters do not destroy nests or drown nestlings.

Least Bitterns build nests on platforms of live and dead stalks usually 15–75 cm above water in emergent vegetation, specifically, dense or moderately dense cattails or bulrush (Rosenberg et al. 1991, Gibbs et al. 1992). They typically raise one to two broods of three young (Weller 1961) and occasionally nest in loose colonies (Gibbs et al. 1992). Least Bitterns primarily forage from emergent vegetation by stalking prey near the surface of water (Gibbs et al. 1992). 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).

THREATS

The primary threat to this species is the loss and degradation of its freshwater marsh habitat (Gibbs et al. 1992). If corrective action is not taken, loss of habitat in the Salton Sink from rising salinity levels could reduce or eliminate one of the state's largest breeding populations. 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.). An increasing threat comes from invasive species, such as Purple Loosestrife (*Lythrum salicaria*) and Common Reed, that degrade habitat (Gibbs et al. 1992). Water contamination could threaten bitterns directly through poisoning or indirectly by reducing the availability of prey. Storm-water runoff and other polluted water may also increase exposure to *Eustrongylides*, a nematode parasite found in small fish that could potentially devastate bittern populations (Gibbs et al. 1992). Operation of watercraft and other human disturbance within or near occupied habitat could adversely affect bitterns during the breeding season by flushing adults from nests and reducing nesting success or by increasing collision rates with man-made objects.

MANAGEMENT AND RESEARCH RECOMMENDATIONS

- Preserve, protect, and improve shallow marshes >10 ha with dense emergent vegetation (Gibbs et al. 1992).
- Protect existing patches of habitat used by breeding, wintering, and dispersing Least Bitterns at sites identified as occupied habitat on the basis of recent records or future monitoring efforts.
- Manage summer wetlands to increase the availability of suitable bittern habitat by extending, where feasible, the current four-year cycle for refuge marsh management to one of about seven years.
- Minimize disturbance to Least Bitterns during their nesting season.
- Conduct studies of the breeding biology of Least Bitterns in a variety of locations that support core populations and identify key factors that may limit nest success.
- At a sample of key sites, analyze eggs to measure contaminants, and determine the levels of toxicity and effects on Least Bitterns.
- Conduct research to determine the minimum patch size of suitable breeding habitat.
- Assess the social structure and nest success rates of "loose colonies" and compare with that of noncolonial populations.

MONITORING NEEDS

Trends in the state's breeding population should be monitored every three to five years using a protocol developed to ensure accurate results, taking into account fluctuations caused by periods of drought and flood. This species is relatively difficult to survey without a comprehensive knowledge of the variety of Least Bittern vocalizations (Rosenberg et al. 1991, W. Hunter pers. comm., C. Conway pers. comm.). Such a protocol should be compatible with those for secretive marsh birds currently being developed at the continental scale. It would be valuable to monitor the effects of selenium and other toxins at the Salton Sea and other areas with compromised water quality where bitterns breed. In particular, populations and habitat suitability should be monitored at the Salton Sea to evaluate the effects of increasing salinity in this area.

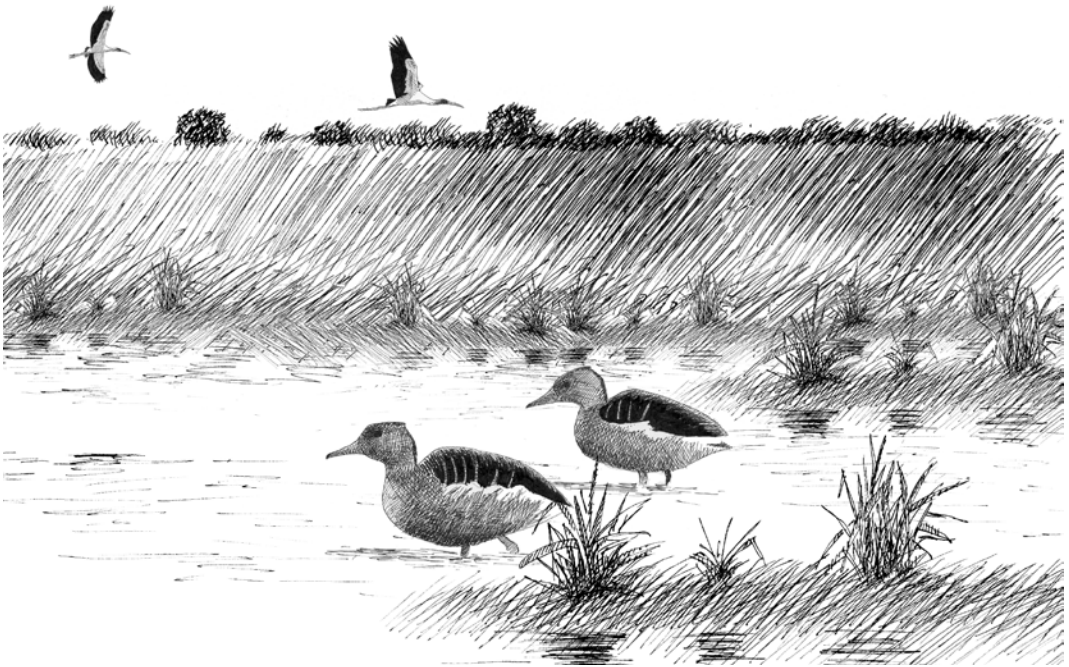
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