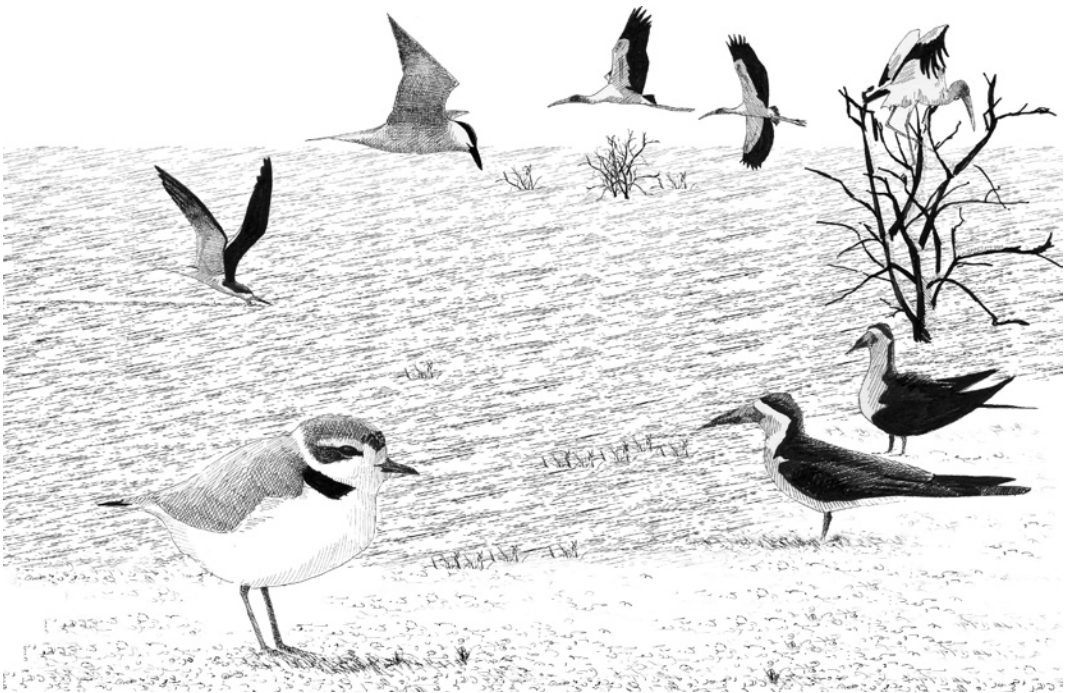


II

SPECIES ACCOUNTS



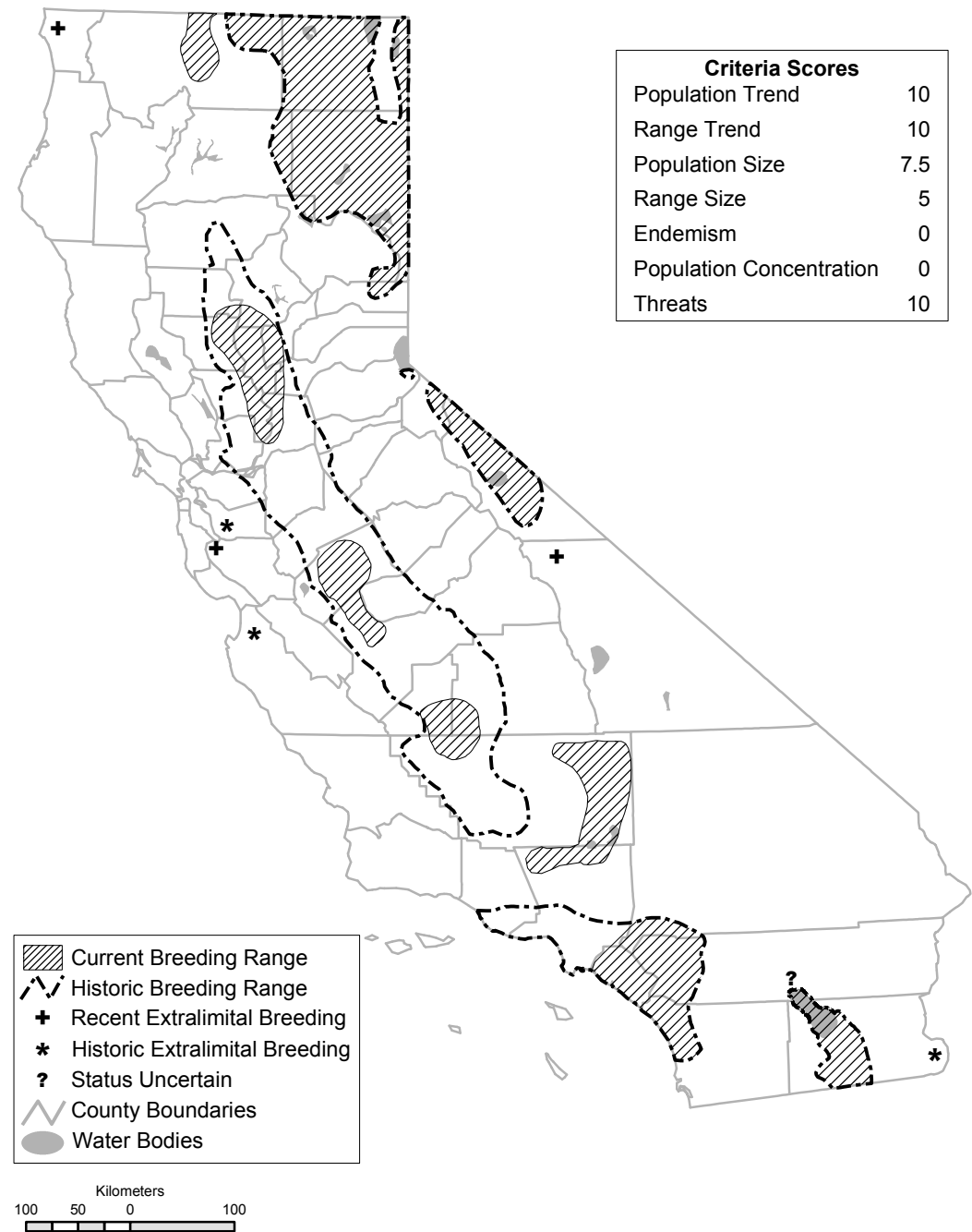
Andy Birch

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REDHEAD (*Aythya americana*)

EDWARD C. BEEDY AND BRUCE E. DEUEL



Current and historic (ca. 1944) breeding range of the Redhead in California. Numbers reduced greatly overall, and range has retracted in the Central Valley and on the southern coastal slope since 1944; breeds, or has bred, very locally and sporadically outside the primary range. Occurs more widely in winter, when numbers augmented by migrants.

SPECIAL CONCERN PRIORITY

Currently considered a Bird Species of Special Concern (breeding), priority 3. Not included on prior special concern lists (Remsen 1978, CDFG 1992).

BREEDING BIRD SURVEY STATISTICS FOR CALIFORNIA

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

GENERAL RANGE AND ABUNDANCE

Breeds from central Alaska, British Columbia, central Canada, and the midwestern United States south to southern California, Arizona, New Mexico, and north-central Texas; also sporadically in the northeastern United States, southeastern Canada, and interior Mexico. Winters in coastal areas from southern Canada south to southern Mexico and Guatemala. More than 80% of the wintering population occurs along the Gulf Coast from Florida to the Yucatán Peninsula; coastal Texas is a major staging area during fall migration. In the interior, winters from British Columbia and Washington south throughout the central, southern, and eastern states; important concentration areas are the Great Lakes region, the Snake, Mississippi, and Ohio river valleys, southern Texas, and California (Palmer 1976, Johnsgard 1978, Bellrose 1980, AOU 1998, Woodin and Michot 2002).

SEASONAL STATUS IN CALIFORNIA

Occurs year round in California, though status varies regionally. From mid-September to early April, migrants and winter visitors augment the relatively small breeding population (Grinnell and Miller 1944). In California, the breeding season extends from April through August (Cogswell 1977).

HISTORIC RANGE AND ABUNDANCE IN CALIFORNIA

Historically, Redheads occurred as permanent residents or winter visitors in suitable wetland habitats throughout much of the state (Dawson 1923). Although most breeders were concentrated in northeastern California, the Central Valley, and the southern California coast, nesting was also documented along the central coast in Alameda and Monterey counties (Grinnell and Miller 1944).

Redhead numbers were "greatly reduced" in California in the early 20th century in response to drainage of wetlands and overharvest of breeding and wintering birds by market hunters, as evidenced by the declining numbers sold in the markets after about 1910 (Grinnell et al. 1918). Of more than 1.6 million ha of wetlands that once existed in the Central Valley, only 227,000 ha remained in 1939 (Frayer et al. 1989). By the mid-1940s, the metropolis of the Redhead's "relatively small" breeding population had been further reduced to "remaining suitable parts of the Great Central Valley and northeastern lake region" (Grinnell and Miller 1944).

Northeastern California. Some of the most important Redhead breeding areas in California included the extensive marsh and wetland complexes of Lower Klamath Lake, Siskiyou County, and Tule Lake, Siskiyou and Modoc counties (Grinnell et al. 1918). Redheads also bred at Rowlands Marsh, South Lake Tahoe, El Dorado County, from at least 1927 to 1936 (Orr and Moffitt 1971), and in Long Valley (Dayhe Hot Springs) and the Adobe Valley (Black Lake), Mono County (WFVZ egg set data).

Central Valley. Redheads were among the breeding waterfowl "seen daily in numbers" at marshes near Los Banos, Merced County (Chapman 1903); nesting was documented near Los Banos, Gustine, Merced, and Dos Palos (MVZ and WFVZ egg set data). They also nested near Sacramento, Sacramento County; Columbia Ranch, Fresno County; Gearnsey's Slough, near Tulare, Tulare County; near Buena Vista Lake, Kern County, and at other suitable wetlands throughout the Sacramento and San Joaquin valleys (Grinnell and Miller 1944, MVZ and WFVZ egg set data).

Southern coast. Documented breeding locations include Ventura County; near Los Angeles, Los Angeles County; San Jacinto Lake, Riverside County; and San Luis Rey Valley, San Diego County (Grinnell and Miller 1944).

Southern deserts. Breeding was documented in 1943 near Laguna Dam, Imperial County, along the lower Colorado River (Monson 1944). The creation of the Salton Sea in the early 20th century resulted in extensive new areas of suitable breeding habitat for Redheads (Patten et al. 2003), though dates of colonization are unknown.

RECENT RANGE AND ABUNDANCE IN CALIFORNIA

The outline of the Redhead's breeding range has retracted since 1944 (see map), especially

in the Central Valley and along the south coast. The statewide breeding population also has been greatly reduced from historic conditions.

Surveys for nesting waterfowl conducted by California Department of Fish and Game and U.S. Fish and Wildlife Service in key portions of the species' range in California from 1949 to the present have limitations for evaluating statewide Redhead population trends, since the survey design changed substantially over time (D. Yarraguirre in litt.). Methods varied in the types of aerial surveys conducted (ranging from selected to random transects to "complete coverage" of variable numbers of selected areas), in whether counts were of just "nesting pairs" or were a "breeding population index" (all birds encountered, including single drakes and flocked birds), and in later inclusion of visibility correction factors to account for weather and lighting conditions on the survey dates and a geographic range extension factor to account for the small portion of the total range surveyed.

Given the limitations and changes in survey methods over time, it is not possible to compare raw numbers or indices of Redhead abundance across periods with differing methods. Still, the population trends for two periods within each of which methods were reasonably consistent—1949 to 1985 and 1992 to 2002—were both steadily declining (CDFG unpubl. data). Overall, the existing data suggest that the state's breeding population has been reduced at least moderately (>20%–40%) since aerial waterfowl surveys were first performed in 1949. This is supported by regional survey data and anecdotal observations as outlined below.

Northeastern California. The large wetland complexes at Tule Lake and Lower Klamath NWRs remain strongholds of the state's Redhead population, but the average number of breeding pairs at these sites combined has declined from about 2964 pairs (range = 1100–5600) during 1952–1959 to about 1885 pairs (range = 1140–2785) during 1992–1997 (D. Mauser pers. comm.). Redheads also nest regularly at Modoc NWR, where annual production of young has remained fairly stable, ranging in annual brood counts from 80–465 in the 1970s, to 202–921 in the 1980s, to 119–655 in the 1990s (S. Clay pers. comm.). The species no longer breeds at Lake Tahoe, where former suitable habitat has been lost to development (T. Will Richardson in litt.).

Other wetlands in northeastern California support small numbers of breeding Redheads, especially in wet years. Documented nesting areas include Honey Lake WA (CDFG unpubl. data)

and Mountain Meadows Reservoir and Westwood sewage ponds (H. Green in litt.), Lassen County; Sierra Valley, Plumas and Sierra counties (J. McCormick in litt.); and the Mono Basin, Adobe Lake, Black Lake, and Crowley Lake, Mono County (Gaines 1992, Shuford and Metropulos 1996, J. Dunn in litt.).

Central Valley. Suitable Redhead breeding habitat has continued to decline in the Central Valley, as wetlands had been reduced to about 98,000 ha by the mid-1980s, representing a historical loss of >99%. Vast wetland complexes such as Buena Vista and Tulare lakes and wetlands throughout the San Joaquin Valley have been eliminated since the mid-1940s (Frayer et al. 1989, Kreissman 1991).

Small numbers of Redheads continue to nest in the Central Valley, especially on public refuges and private duck clubs that maintain summer water >1 m deep (CDFG and USFWS unpubl. data). While most refuges and many duck clubs maintain some deep, permanent or semipermanent wetlands (usually 10%–15% of total refuge acreage), most units are <0.5 m deep and do not provide suitable Redhead nesting habitat. For example, the Sacramento and San Luis NWR complexes and Gray Lodge and Yolo Basin WAs provide suitable wetlands through the summer (i.e., >0.4-ha units of water 1–2 m deep), but only a few Redhead broods are usually seen per season (D. Feliz, D. Hardt, M. Wolder, D. Woolington, and M. Womack pers. comm.). Flooded borrow pits on Mendota WA and at the adjacent Mendota Pool, Fresno County, maintained with average water depths of 1–2 m, support about 10–12 confirmed nesting pairs annually (R. Huddleston pers. comm.). Nesting still occurs in the Tulare Basin in the southern San Joaquin Valley, where in June in particularly favorable years numbers of adults can exceed 100 at a single site (J. Seay in litt.). Some other recent documented nesting localities in the Central Valley include private wetlands in the Butte Sink and along Honcut Creek, Butte County; near Woodland (some drained in mid-1990s) and in the Yolo Bypass, Yolo County; in the Grasslands Ecological Area, Merced County (J. Kwolek pers. comm., T. Beedy pers. obs.); Pixley NWR, Tulare County; and Kern NWR, Kern County (P. Williams in litt.).

There appear to be no recent records of Redheads nesting in the Suisun Marsh and Sacramento–San Joaquin River Delta (C. Fien, W. Holt, D. Loughman, J. Trochet pers. comms.).

Southern coast. Small numbers of Redheads summer on coastal lagoons and inland ponds

(Garrett and Dunn 1981). Redheads breed regularly at the Prado Basin, San Bernardino and Riverside counties, where since 1990 about 5–12 broods have been observed annually (J. Pike in litt.). A few pairs may also nest at Baldwin Lake, San Bernardino County (Garrett and Dunn 1981). Small numbers breed regularly at San Jacinto WA, Riverside County (T. Paulek pers. comm.). Breeding pairs and broods also have been observed at Bolsa Chica and San Joaquin Marsh, Orange County (Hamilton and Willick 1996). In San Diego County, where the breeding population has remained low for decades, nesting has been documented along the lower Santa Margarita River and at Whelan Lake, Buena Vista Lagoon, Batiquitos Lagoon, San Elijo Lagoon, and Los Peñasquitos Lagoon (Unitt 2004).

Southern deserts. Breeding has been confirmed at the Bishop sewage ponds, Inyo County, in 1975 (T. & J. Heindel in litt.) and in the Antelope Valley, Los Angeles County (Garrett and Dunn 1981). In eastern Kern County, Redheads breed at China Lake (5–10 pairs), near Cantil, and at Edwards Air Force Base (Heindel 2000). Although breeding has not been documented along the lower Colorado River since the 1940s, the species still occurs there irregularly through the summer (Rosenberg et al. 1991). Redheads continue to breed regularly at the Salton Sea NWR, at Fig Lagoon, and at nearby freshwater lakes, including the Wister and Finney-Ramer units of the Imperial WA, Imperial County (Patten et al. 2003). The breeding population has been reduced in recent years, however, and only a few broods are now seen during annual counts at the Salton Sea (C. Pelizza pers. comm.).

Just to the west of the deserts in the very southern Sierra Nevada, Redheads breed at least irregularly at Prince Pond in South Fork Kern River Valley, Kern County (B. Barnes, S. Laymon in litt.).

ECOLOGICAL REQUIREMENTS

Redheads usually nest in freshwater emergent wetlands where dense stands of cattails (*Typha* spp.) and tules (*Scirpus* spp.) are interspersed with areas of deep, open water (Grinnell et al. 1918, Grinnell and Miller 1944, Palmer 1976, Bellrose 1980). When nesting, they prefer relatively deep (>1 m) permanent or semipermanent wetlands of at least 0.4 ha, with about 75% open water and vegetation up to about one meter in height. They also nest in somewhat alkaline marshes and potholes of the interior (Johnsgard 1978, Palmer 1976, Woodin and Michot 2002).

Redheads are solitary, monogamous nesters that often parasitize the nests of other ducks (including Redheads) and waterbirds. However, some females lay eggs only in their own nests or are partially parasitic. Nests, built from marsh plants and secured to tall emergent vegetation, are placed usually over water but occasionally on islands or even dry ground. That reproductive success is generally low, and juvenile and adult mortality rates relatively high, in this species makes it particularly vulnerable to factors that may threaten its population viability (Hickey 1952, Rienecker 1968, Palmer 1976, Johnsgard 1978, Bellrose 1980, Woodin and Michot 2002).

In winter and migration, Redheads forage and rest on large, deep bodies of water and may form rafts far from shore. They secure food mostly by diving in water >1 m in depth. Unlike most diving ducks, their diet consists mostly of submergent, aquatic plants such as pond weeds (*Potamogeton* spp.), wigeon grass (*Ruppia* spp.), and duckweeds (*Lemna* spp.); they also take a few aquatic insects, grasshoppers, larvae of midges and caddisflies, small clams, and snails (Martin et al. 1951, Palmer 1976, Bellrose 1980, Woodin and Michot 2002).

THREATS

Primary threats to breeding Redheads in California include ongoing losses and degradation of wetlands, pesticides and other contaminants, and, possibly, hunting pressure. Wetland degradation and loss can be expected to continue in the state in the future (Kreissman 1991). In 1986, the adoption of the North American Waterfowl Management Plan provided a framework to restore continental waterfowl populations to levels of the 1970s. Implementation of this plan has resulted in the restoration of about 24,281 ha in the Central Valley Joint Venture in the past 15 years (D. Yparraguirre pers. comm.). Most of this acreage, however, is dedicated to shallow, seasonal wetlands that do not provide suitable breeding habitat for Redheads.

Recent conflicts over water allocations for Endangered Species Act compliance, fish, agriculture, and wetlands have reduced water supplies to Klamath Basin refuges, particularly in the summer and fall, and this could affect Redhead breeding habitats (D. Mauser pers. comm.). Similarly, agreements to transfer water from the Imperial Irrigation District to cities in southern California will further reduce the freshwater inflows and water quality at the Salton Sea. Future conflicts over water supplies in the Central Valley, the

Sacramento–San Joaquin River Delta, and southern California will likely reduce the extent of permanent and semipermanent wetlands on refuges and duck clubs that provide the best remaining Redhead breeding habitats. Because they require deep summer water for successful breeding, Redheads are especially vulnerable to sudden changes in water levels that may occur when their nesting areas are flooded or dried rapidly (Woodin and Michot 2002).

In many breeding areas, including the Klamath Basin, the Central Valley, and the Salton Sea, wetlands experience contamination by pesticides, herbicides, or heavy metals such as mercury and selenium (Woodin and Michot 2002). Despite efforts to improve the quality of water delivered to refuges and duck clubs, selenium levels remain elevated in waterbirds in the Grasslands Ecological Area of Merced County (Paveglione et al. 1997). Redheads also tend to concentrate breeding efforts in marshlands susceptible to botulism outbreaks, increasing adult and juvenile mortality rates in affected areas (Johnsgard 1978).

Redheads are currently managed as a “Harvest” species in California, and two can be legally taken per licensed hunter per day during the hunting season. The effects of hunting on the state’s breeding population are unknown, but numbers have increased since the mid-1990s in portions of the upper Midwest with continued hunting pressure (USFWS 2002). Hunter recovery data for juvenile Redheads banded at state and federal refuges have not been analyzed to determine the effects of hunting on annual survival rates of local or regional breeding populations (D. Yparraguirre pers. comm.). Based on limited data, it appears that early-season hunting pressure may sometimes cause mortality of a high proportion of the locally produced, first-year Redheads in historically important areas, such as the Central Valley, where current breeding populations are small. For example, a high proportion of the 75–100 juvenile Redheads banded per year at Gray Lodge WA in 1973 and 1974 were harvested during the first few weeks of the hunting season (B. Deuel pers. obs.). Redheads (especially juveniles) may be taken in disproportionately high numbers by hunters since they are relatively easy to decoy and hunt compared to most other waterfowl species (Grinnell et al. 1918). Conversely, a decline in the proportion of Redheads in the early-season (Oct) waterfowl harvest in California from 1965 to 2002 (CDFG unpubl. data) may simply reflect a decline in overall numbers of Redheads in the state (D. Yparraguirre in litt.), perhaps from factors other than harvest

rates. Review of post-1990 harvest records from Central Valley refuges indicates that only a few Redheads (usually <20 birds per refuge) are currently taken by hunters each season (D. Feliz, M. Wolder, D. Woolington, and M. Womack pers. comm.). While the total harvest of this species on individual refuges and duck clubs may be low compared to most other hunted species, the cumulative effects of hunting on the Redhead’s statewide breeding population needs further evaluation.

MANAGEMENT AND RESEARCH RECOMMENDATIONS

- Where feasible, increase the extent of permanent and semipermanent, deep-water (>1 m) marshes to provide suitable Redhead breeding habitat. Optimally, such wetlands should be >0.4 ha in extent and offer a mosaic of about 75% open water interspersed with dense emergent vegetation. Evaluate how much, and where, such suitable wetland acreage is needed to increase California’s breeding population.
- Work for allocation of adequate water supplies to allow for management of suitable wetlands; use state and federal incentive programs to promote permanent and semipermanent wetlands on private lands.
- Evaluate the causes of nesting failures of this species to determine the factors most responsible.
- Analyze CDFG’s existing breeding and midwinter survey data to estimate population trends by region of the state since the 1950s.
- Evaluate the relationships between the number of pairs counted during aerial surveys and results of ground surveys (e.g., pairs, active nests, females with broods) to estimate more accurately the statewide and regional breeding population size and productivity.
- Continue banding studies, and examine existing banding and hunter bag data by season and region to evaluate the effects of hunting on juvenile mortality and survivorship and on trends in the state’s breeding population.
- Based on breeding population and mortality trends, set thresholds for target breeding populations and reproductive levels required to maintain or increase key regional populations of the species over a five-year evaluation period.

MONITORING NEEDS

In addition to aerial waterfowl surveys performed by CDFG and USFWS, ground-based counts for breeding Redheads (e.g., pairs, active nests, broods) should be conducted annually by refuge biologists during the species' peak breeding period from May to July. Special searches for evidence of nesting by this species should be made at a representative sample of deep-water wetlands using standardized waterfowl census/brood search techniques. Where possible, suitable wetlands on private lands should also be surveyed for breeding Redheads.

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