13.1.11. Life History Traits and Habitat Needs of the Redhead

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Species Profile—Redhead

Scientific name: *Aythya americana* (Eyton)
Weight in pounds (grams):
Adults—male 2.4 (1,087), female 2.1 (953)
Immatures—male 2.1 (953), female 1.9 (862)
Age at first breeding: 1 or 2 years
Clutch size: 7–10 eggs
Incubation period: 24–25 days
Age of fledging: 10–12 weeks
Nest sites: Semipermanently and seasonally flooded palustrine wetlands with persistent emergent vegetation.
Food habits: Omnivorous, except in winter; shoalgrass rhizomes and wildcelery winter buds during winter; tubers, rhizomes, and parts of aquatic vegetation, and aquatic invertebrates (insects, crustaceans, and mollusks) during spring, summer, and fall.

Redheads are one of five common diving duck species in North America. They are in the same taxonomic group as the pochards or bay ducks and are most similar in appearance and behavior to the canvasback. Smaller body size, late breeding, wintering in southern areas, and tolerance to salt in winter and in breeding areas differentiate the redhead from the canvasback and suggest an evolutionary origin in the arid areas of the West. Parasitism of other waterfowl nests is more pronounced in redheads than in other North American waterfowl. These and other aspects of the biology of the redhead are the subject of this leaflet. Readers who are interested in general references on redheads are referred to Palmer (1976) or Bellrose (1980).

Distribution

Redheads breed in unforested areas with semipermanently to permanently flooded palustrine wetlands that support persistent emergent vegetation. The highest numbers of redheads breed in the prairies and parklands of Manitoba, Saskatchewan, North Dakota, and South Dakota (nest densities = 10–25/mile^2 [4–10/km^2]). Nest densities are highest in the marshes of Nevada and Utah (180–550/mile^2 [69–214/km^2]; Fig. 1) where this species may have first evolved.

Redheads winter on brackish to hypersaline waters in the southern United States and in Mexico. An estimated 80% of redheads winter on the hypersaline Laguna Madre along the Gulf Coast of northern Mexico and southern Texas, but some select other parts of the Gulf Coast and the southern Atlantic Coast (Fig. 1). Migration routes to

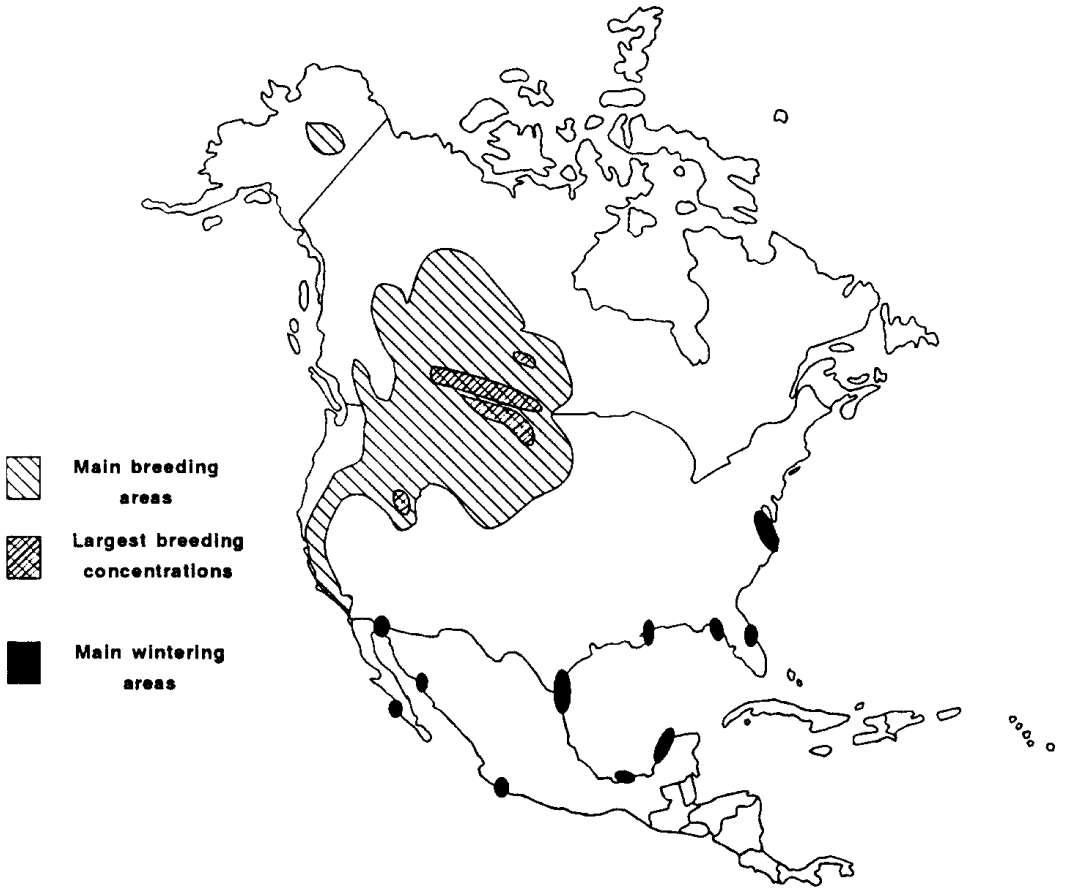

Fig. 1. Distribution of important breeding and wintering areas of redheads.

these wintering areas do not follow flyways. Redheads that breed in the Pacific Flyway and in the Central Flyway winter in the Central Flyway. Few redheads migrate through the Mississippi Flyway.

Spring Migration

Most redheads depart wintering areas in the Laguna Madre within 2 weeks in early March and wintering areas on the Atlantic Coast in mid-March (Fig. 2). They move through Iowa, Kansas, and Nebraska in March and reach Canada by mid-April. They are considered midseason migrants because they migrate later than mallards, green-winged teals, and northern pintails but earlier than gadwalls and ruddy ducks.

Breeding

Wetland Habitats

In the prairie potholes of Montana and northwestern Iowa and in the intermountain West, redheads use two types of permanently and semipermanently flooded palustrine wetlands for breeding. When they first arrive (prelaying period), redheads feed in large, deep, open areas (>1 acre [0.4 ha]) with submersed aquatic vegetation (Fig. 2). They use smaller, more shallow permanent to semipermanent wetlands with blocks of dense emergent vegetation for nesting (laying and incubating eggs). Wetlands that redheads use during prelaying and brood rearing are similar. Essential elements include a good supply of preferred foods such as invertebrates and submergent plants, ample water depth for escape

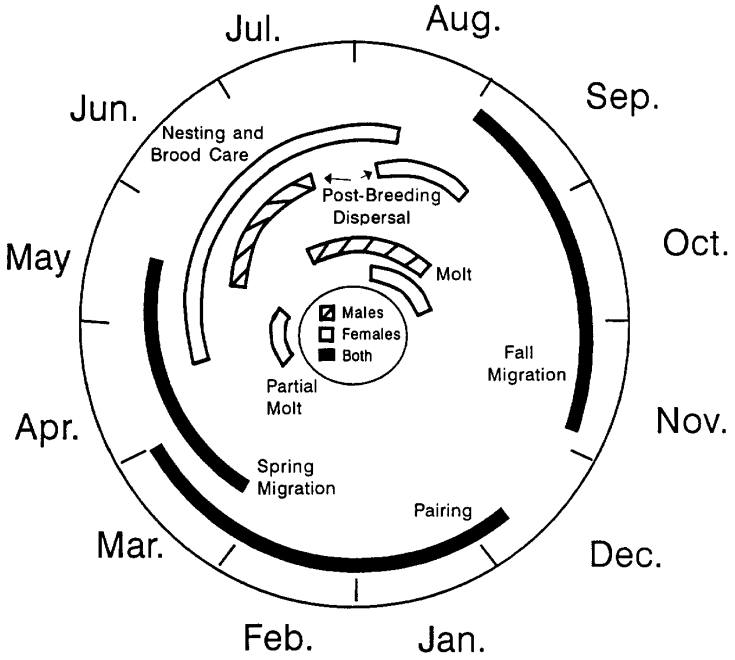

Fig. 2. The chronology of important life history events in the annual cycle of the redhead.

(>4 ft [>1.2 m]), and large open areas where approaching predators are visible.

Redheads use widgeongrass in saline lakes or energy-rich seeds in shallow, temporary ponds during the prelaying and laying periods in North Dakota. They rely on deep, open areas during droughts when shallow-water areas are not available. Because of low rates of nutrient recycling and a scarcity of feeding areas in open water, the quantity of food may not be as great as in shallow-water areas. Broods in all areas use shallow (<2 ft [<0.6 m]) ponds if emergent vegetation is available for escape cover.

Impoundments and other intensively managed wetland complexes in California and Wisconsin are used by redheads. In Wisconsin, redheads nest in semipermanently flooded cattail marshes or hardstem-bulrush marshes but feed in nearby seasonally flooded impoundments managed for moist-soil plants (rice cutgrass and smartweed). Initially, broods use areas with abundant insect larvae (such as seasonally flooded impoundments) and later move to more open areas (such as semipermanent impoundments) with pondweeds and duckweed.

Nest Site Requirements

Wetlands that are 5 acres (2.0 ha) or larger and not farther than 0.25 miles (0.4 km) from large permanent or semipermanent lakes provide optimum nesting habitat. Females usually place nests in dense bulrush or cattail stands that are interspersed with small (2–3 yd^2 [1.7–2.5 m^2]) areas of open water. Wetlands that are smaller than 1 acre (<0.4 ha) must contain large blocks of emergent vegetation for adequate seclusion and protection of nesting redheads.

Redheads begin building nests over water with remnants of the previous year's vegetation and use new vegetation as it becomes available. Redheads seem to prefer to nest in hardstem, slender, and Olney bulrushes but also use river and awned sedges, narrow-leaved and common cattails, and whitetop. These plants offer a firm structural framework for the nest and cover for above the nest. A residual stem density of 35–45 bulrush

stems/ft^2 (350–450 stems/m^2) or 3–5 cattail stems/ft^2 (32–52 stems/m^2) provides adequate cover and a foundation for the nest.

The presence of water seems more important than specific vegetation for nesting. Although redheads do not always nest over water, their nests are usually placed within 10–13 ft (3–4 m) of open water. However, redhead nests have been reported as far away as 755 ft (230 m) from open water. Stable water levels are important to nesting success. The bottom of the nest is usually between 2 and 10 inches (4–24 cm) above the water. If water levels rise, nests may be lost to flooding if females cannot raise the level of the nests. If the wetland dries, nests may be destroyed by predators or deserted.

Brood Size and Chronology

The brood size of redheads averaged 7 in Iowa and 5 in Nevada; most losses of young occurred within the first few days of life. The female usually deserts her brood when the ducklings are about 8 weeks old and still flightless. In contrast, ring-necked ducks and many dabbling duck species do not desert their yet-flightless young. Young redheads fly at 10–12 weeks.

Food Habits

During spring migration and the breeding season, adult redheads are opportunistic and omnivorous. In spring in North Dakota and Canada, redheads feed primarily on protein-rich invertebrates, including Diptera larvae and Trichoptera (>50% by volume). Much of their remaining diet consists of bulrush seeds and sago pondweed buds (≤15% by volume). In North Dakota and Wisconsin, breeding redheads may rely on seeds of moist-soil plants (smartweed, rice cutgrass, bulrush) when invertebrates are scarce. In Nevada, adult redheads consume bass eggs, odonate nymphs, and seeds and vegetative parts of sago pondweed, alkali bulrush, and muskgrass.

Studies in North Dakota did not reveal diet shifts, but some studies in Wisconsin revealed different proportions of invertebrates, seeds, and vegetation in the diet among prelaying, laying, and postlaying females. Redheads may have a physiological need for a seasonal shift in diet, but such a shift may not always occur because the desirable foods are not available.

Redhead ducklings eat a wide variety of foods, including insect larvae, seeds, muskgrass oogonia, and tubers. The ducklings usually move from a diet that is high in animal matter just after they hatch to a diet of almost exclusively plant matter as they approach fledging. In Wisconsin, ducklings eat mainly Hemiptera nymphs and adults, Diptera larvae, and bulrush seeds during the first 3 weeks of life. As they grow older, ducklings switch to a diet of mainly vegetation such as sago and slender pondweed, duckweed, and bulrush achenes.

Reproductive Strategy

Redheads may lay as much as 75% of their eggs in the nests of other waterfowl; as much as 50% of a redhead's production is from parasitic eggs. Redheads seem to follow a dual strategy. In favorable years (abundant food, normal water levels and weather conditions), redheads increase their fecundity by laying 6–10 parasitic eggs before they initiate normal nesting. Parasitic eggs are produced without the time, energy, and risk associated with nest building, incubation, and brood rearing. In poor years (less abundant food or drier water conditions), younger females usually are entirely parasitic and older females nest normally, but neither age class does both. Although the hatching rate of parasitic eggs is about half that of nonparasitic eggs (90% hatching rate), females that also nest normally increase their fecundity with parasitic eggs.

The number of parasitic eggs per host nest averages between 3 and 5 in nests of canvasbacks, 4 in nests of lesser scaups, and 3 in nests of other species. Parasitism lowers the productivity of the host species because there are fewer host eggs in parasitized nests. Some of the host's eggs are pushed from the nest during the intrusion by the parasitic redhead. Redhead parasitism rates increase with increasing densities of other duck species. Redheads also parasitize nests of mallards, northern pintails, northern shovelers, gadwalls, American wigeons, blue-winged and cinnamon teals, ruddy ducks, and other redheads. The selection of host species may result from overlapping nest chronologies and selection of similar nesting habitat.

Postbreeding Dispersal and Fall Migration

The postbreeding dispersal of males and nonbreeding females begins in June (Fig. 2), and breeding females disperse when their young are 8

weeks old or older. Redheads of both sexes and all ages usually move north from their breeding locations to large lakes and reservoirs before molting and the subsequent fall migration. Large lakes may provide molting, flightless redheads with protection from predators and a rich food source. One very important lake for staging and molting, especially for males, is Lake Winnipegosis in Manitoba. At peak migration in 1975, an estimated 144,000 redheads were on that lake. In Utah, flightless adults usually remain in the wetland complex where they nested.

Males are flightless during late July and early August. Females become flightless approximately 6 weeks after they desert their broods. Flightless redheads usually swim or dive to escape; unlike many dabbling ducks, they rarely flap across the water.

Postbreeding adults in Manitoba eat primarily winter buds and parts of sago pondweed and muskgrass. They also ingest lesser amounts (<5% dry weight) of bulrush achenes, widgeongrass, and midge larvae and adults.

Winter Habitats and Behavior

Eighty percent of all redheads winter on the Laguna Madre of Texas and Mexico. When redheads first arrive on the hypersaline Laguna Madre, they make daily trips to adjacent freshwater ponds. They also select feeding sites with the lowest possible salinities (approximately ≤30 ppt) in the Laguna Madre. As their salt glands increase in size, the requirement for fresh water daily diminishes. By mid- to late December, fewer redheads travel to freshwater wetlands each day. The number of redheads that seek fresh water later in winter is determined by salinities in the Laguna Madre. Where salinities are high (45–60 ppt), 50% or more of the redheads are on fresh water daily throughout winter. Where salinities are lower (30–35 ppt), fewer than 15% visit fresh water daily. Freshwater sites that redheads frequent usually have salinities of less than 15 ppt and are usually within 2–4 miles (4–7 km) of feeding areas. Redheads use freshwater sites for drinking, preening, and bathing but not for feeding.

Although redheads are diving ducks, they feed most often by head dipping or tipping up (>75% of the time) in 5–12-inch-deep (12–30-cm) water on the Gulf Coast. Redheads spend about 5 h each day feeding in this manner. Feeding by diving requires about 3 times as much time and costs more energy than feeding by head dipping or tipping up. Redheads may dabble for food during the breeding season.

Food Habits

During winter, redheads in the Laguna Madre eat shoalgrass rhizomes almost exclusively, even though other vegetation is also available. As much as 15% of the food by volume (approximately 20% by weight) can be mollusks, mainly small snails such as dovesnails, variable ceriths, and virgin nerites. Whether these mollusks are ingested selectively or only incidentally to rhizome gathering is not known. In the Chesapeake Bay, wintering redheads eat winter buds of wildcelery and sago pondweed.

Courtship and Pairing

Redheads begin pairing during winter. In southern Texas, approximately 30% of the redhead females were already paired by late December and nearly 50% by late February. Females are the more aggressive member of the pair and are usually responsible for pair defense. Paired redheads continue their courtship on the breeding areas but do not copulate until the pair bond is well established.

Population Status and Harvest

The target of the North American Waterfowl Management Plan for redheads is a population size of 760,000 birds. The average population size has been at this level for the past 2 decades (759,800 during 1970–79 and 825,800 during 1980–89). The successful maintenance of redhead populations at targeted levels may have been in part the result of closed seasons and restricted bag limits for this species. Populations also may be stable because redheads use permanent and semipermanent wetlands for breeding. Because these wetland types usually persist during droughts, redheads are more likely to have a place to nest than are other waterfowl species that rely on temporarily or intermittently flooded wetlands. Furthermore, redheads are less traditional than canvasbacks in their choice of breeding areas and are therefore more likely to move into different breeding areas to take advantage of adequate water conditions.

Redheads make up 2% of the North American ducks but less than 1% of the harvested ducks in

the United States. The average number of harvested redheads per year was 184,000 during 1971–79 and 171,100 in 1982 and 1983 but only 37,400 during 1989–91. The reduction in number of harvested redheads between the 1970's and 1989–91 is paralleled by a reduction in the number of hunter days and the size of the seasonal bag per hunter. Most redheads are harvested in the Central Flyway (1–3% of the total duck harvest), and fewest are taken in the Atlantic Flyway (0.1–0.6% of the total duck harvest).

Implications for Management

Because redheads need a combination of habitats during the breeding season and are specialists during the postbreeding and wintering portions of their life cycle, they offer a challenge to managers. Management for redheads in the prairies should focus on wetland complexes. Deeper water with invertebrates or shallow water with moist-soil plants should be made available during the prelaying period. Water levels should be kept constant during the laying and incubation periods to reduce losses of clutches from flooding or from predators if the area becomes too dry. Recently flooded areas with high invertebrate populations should be available during the first few weeks of the brood period and should be followed by access to deeper water with ample pondweeds.

The parasitic nature of redheads also offers a challenge to managers. An increase in the numbers of nesting redheads may be at the expense of other waterfowl species. Females whose nests are parasitized by redheads have a lower productivity than conspecifics whose nests are not parasitized.

Large concentrations of postbreeding redheads occur on only a few large lakes that provide protection from predators, a rich food supply, and minimal human disturbance. Because these traditional postbreeding areas are limited, they have to be preserved.

During winter, redheads on the Laguna Madre prefer shallow (5–12 inches [12–30 cm] deep), open water with shoalgrass on the bottom. Especially early in winter before they have acclimated to hypersaline conditions, redheads also require a source of fresh drinking water within 4–5 miles (6–8 km) of their feeding sites. Since the 1960's, monotypic shoalgrass meadows declined by over 50% in certain parts of the Laguna Madre. Concurrently, recreational and industrial uses of these coastal areas increased. Important areas for redheads, especially areas in shallow water, need to be identified and protected from human disturbance and further loss of shoalgrass. When wildcelery disappeared from the Chesapeake Bay, redheads (unlike canvasbacks) did not switch to an alternate food such as Baltic macomas—they abandoned the area. This may indicate their lack of flexibility in food choice during winter and emphasize the need to protect remaining wintering habitat.

Suggested Reading

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Appendix. Common and Scientific Names of the Plants and Animals Named in the Text.

Plants	
Awned or slough sedge	*Carex atherodes*
River sedge	*C. lacustris*
Muskgrass	*Chara* sp.
Shoalgrass	*Halodule wrightii*
Rice cutgrass	*Leersia oryzoides*
Duckweeds	*Lemna* spp.
Smartweeds	*Polygonum* spp.
Sago or fennelleaf pondweed	*Potamogeton pectinatus*
Slender pondweed	*P. pusillus*
Widgeongrass	*Ruppia maritima*
Hardstem bulrush	*Scirpus acutus*
Slender bulrush	*S. heterochaetus*
Olney bulrush	*S. olneyi*
Alkali bulrush	*S. paludosus*
Whitetop	*Scolochloa festucacea*
Narrow-leaved cattail	*Typha angustifolia*
Common cattail	*T. latifolia*
Wildcelery	*Vallisneria americana*
Invertebrates—Arthropoda	
Flies, midges	Diptera
True bugs	Hemiptera
Dragonflies and damselflies	Odonata
Caddisflies	Trichoptera
Invertebrates—Mollusca	
Greedy dovesnail	*Anachis avara*
Variable cerith (sometimes called horn shell)	*Cerithium lutosum*
Baltic macoma (sometimes called Baltic clam)	*Macoma balthica*
Lunar dovesnail	*Mitrella lunata*
Virgin nerite	*Neritina virginea*
Birds	
Northern pintail	*Anas acuta*
American wigeon	*A. americana*
Northern shoveler	*A. clypeata*
Green-winged teal	*A. crecca*
Cinnamon teal	*A. cyanoptera*
Blue-winged teal	*A. discors*
Mallard	*A. platyrhynchos*
Gadwall	*A. strepera*
Lesser scaup	*Aythya affinis*
Redhead	*A. americana*
Canvasback	*A. valisineria*
Ruddy duck	*Oxyura jamaicensis*
Fish	
Largemouth bass	*Micropterus salmoides*

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