# ARIZONA GAME AND FISH DEPARTMENT
# HERITAGE DATA MANAGEMENT SYSTEM

**Animal Abstract** **Element Code:** ABNME0501A
**Data Sensitivity:** No

## CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

**NAME:** *Rallus longirostris yumanensis*
**COMMON NAME:** Yuma Clapper Rail
**SYNONYMS:** *Rallus yumanensis, Rallus obsoletus yumanensis, Rallus elegans yumanensis*
**FAMILY:** Rallinae:Rallidae

**AUTHOR, PLACE OF PUBLICATION:** Dickey. 1923. Auk. 40(1):90.

**TYPE LOCALITY:** Laguna Dam near Bard, Imperial County, California.

**TYPE SPECIMEN:** USNM. D.R. Dickey collection number J-1039. May Canfield and Laurence M. Huey, 15 May 1921.

**TAXONOMIC UNIQUENESS:** Rallidae includes rails, crakes, coots, moorhens, and gallinules. *Rallus* has 24 species (3 extinct) (Ripley 1977), although Olson (1973) considers only 9 species. *R.l. yumanensis* 1 of 24 subspecies; 1 of 3 races of federally endangered western clapper rail populations. Only western subspecies that inhabits freshwater marshes.

**DESCRIPTION:**

**Adult:** Smaller subspecies of clapper rail. Male larger than female, standing 20.0-23.0 cm (7.88-9.06 in) tall. Average weight of adult 253.0 g (8.9 oz); males averaging 266.8 g (9.3 oz), females averaging 226.2 g (7.9 oz) (Todd 1986). Eddleman (1989) differs, stating that average weight of females is 193.0 g (6.8 oz). Adult male; tawny-orange or burnt-orange breast, orangish beak (usually brighter than breast), female with brick-orange breast displayed during breeding season. Upper mandible of long, slightly decurved bill is darkish gray, diffusing into orange base. Beak tip often gray, suffused with orange; forehead and crown dark grayish-brown extending down nape to scapular area on back. Side of head behind and below eye subdued gray. Colors of browns and oranges toward underside of head and in the upperside-neck region. White eyelid, iris dark brownish-orange. Light eyebrow stripe extends from just above eye forward to upper mandible. Chin and upper throat subdued white, diffusing into color of adjacent body parts. Upper body surfaces, including back, scapulars, rump and upperwing coverts, patterned by light grays and dark browns becoming blotchy and dominant posteriorly on rump, distally on wings. Flanks and underside, including belly just forward of legs, dark gray with narrow vertical white stripes, producing barred effect. Outside of tibia a light grayish-brown. Long toes, long tarsi and distal tibia are unfeathered, orange-flesh tone. Tail dark brown above, white below.

**Juvenile:** Molting in young presumed similar to other clapper rails. Young retain black natal down through most of first month. Juvenile body plumage obtained in second month; first winter plumage similar to adult. Juvenile plumage varies on fully feathered juveniles with some resembling dull-colored grayish eastern races of clapper rail, while others have extensive black feathering on sides and flanks, resembling Virginia rails (*R. limicola*). Birds in full juvenile plumage begin to attain buffy adult ventral plumage through second body molt, which takes 6-7 weeks. Existence of flightless period during pre-basic molt has been found in all nearctic rails studied. This molt takes about 1 month. First pre-basic molt in juveniles does not begin until after flight feathers grown. This molt completed in early September for most eastern birds, but seems to take a month longer in Yuma clapper rails. Timing and duration of pre-alternate molt speculative because of ability to distinguish adults and juveniles after September (Eddleman 1989).

**AIDS TO IDENTIFICATION:** *R.l. yumanensis* differs from other clapper rails by inhabiting freshwater habitats in breeding season, apparently wintering in brackish marshes along western coast of Mexico. Taxonomic uncertainties within *Rallus* reflect fact that number of subspecies poorly represented both as to scientific specimens and field observation data (Todd 1986). Separation of clapper rails (*longirostris*) and King rails (*elegans*) as distinct *Rallus* species is controversial. Habitat selection per se, has long been one of the most important criteria for separating 2 species. (As we have no King rails in Arizona, this may be a moot point). Vocal calls another way to distinguish these 2 birds. While Yuma clapper rails nest in freshwater marshes, King rails generally nest in saltwater marshes. Many, if not most, of the black downy young of Yuma clapper rails have white neossoptiles (downy feathers on most newly hatched birds) on their anterior abdominal regions, but all of King rail downy young examined lacked this white down (Wetherbee and Meanley 1965). According to Scott (editor 1987) Yuma clapper rails larger than Virginia rails, duller in color than King rails. Also, Yuma clapper rails brighter below compared to east coast rails.

**ILLUSTRATIONS:** B&W drawing (Eddleman 1989:cover)
Color drawing (Peterson 1990:119)
B&W photo (Rosenberg 1991:165)
Color drawing (Scott 1987:97)
Color photo (Terres 1980:724)
Color & B&W photos (Todd 1986:cover, 2, 5, 6, 17, 66)

**TOTAL RANGE:** Lower Colorado River from Gulf of California in Mexico to Topock Marsh on Havasu National Wildlife Refuge at Needles, CA and AZ. Also at Salton Sea, California, and on several major river drainages in central and southwestern Arizona. Currently, northernmost record for *R.l. yumanensis* (May 20, 1986), is at Laughlin Bay on NV side of Colorado River (Rosenberg et al. 1991).

Breeding areas include Mittry Lake (AZ), West Pond, Imperial National Wildlife Refuge, Bill Williams River drainage, Topock Gorge and Topock Marsh on Havasu National Wildlife

Refuge (NWR), Cibola National Wildlife Refuge, and Imperial Wildlife Area. Smaller populations may occur along this range where moderately extensive emergent vegetation is persistent, including backwaters. Believed to winter on west coasts of Sonora, Sinaloa, and Nayarit in Mexico; although small numbers have been observed wintering at Mittry Lake, Topock Marsh, Imperial Valley, and the Salton Sea (Todd 1986).

**RANGE WITHIN ARIZONA:** Bill Williams River drainage, the Lower Gila River from near Phoenix to the Colorado River, lower Salt and Verde Rivers, and at Picacho Reservoir. See "**TOTAL RANGE**" for breeding range.

## SPECIES BIOLOGY AND POPULATION TRENDS

**BIOLOGY:** Probably not long life-span in wild. Longevity record 7.6 years (Todd 1986).

Usually walk upright with up-twitching of short tails (distinguishes them from other birds). Often take alarm cues from other birds' actions. When moderately alarmed or cautious, usually walk off into vegetation. Laterally compressed bodies and ability to steer right and left enable them to make considerable speed afoot through dense vegetation. Slow, weak, fluttering flight; legs dangle, head held high. Adults good swimmers (short distances), swimming with a slightly jerky motion as if continuing walking gait in the water.

**Vocalization:** Vocal responses of birds to playback recordings used regularly to survey populations (used in all rail populations), and to evaluate habitat suitability. Should be surveyed only during early nesting season, because rates of response to taped calls decrease significantly thereafter (Conway et al. 1993). Bird normally heard rather than seen. "Clatter" (rapid series of "keks") seems to be multifunctional, though basically a territorial call; sometimes used as all-is-well call. "Clatter" calls often given in unison in early part of breeding season, at times given at night. Mating call sounds like slow-paced continuous and monotonous "kek-kek-kek," like stick being dragged along wooden picket fence (Todd 1986). Noisiest at dusk, on moonlit nights, just before a storm, and when startled (Terres 1980).

**Predation:** Not known to be subject to high rates of predation, once adulthood is attained. Coyotes and other carnivorous mammals may be more important predators, especially on nests. Predation of eggs and chicks commonly occur from marsh wrens, great-tailed grackles, northern ravens, coyotes, raccoons, and striped skunks. Red-tail hawks, owls, and northern harriers common predators during nocturnal calling. Historically, Harris and Cooper's hawks common predators (Todd 1986). Eddleman (1989) found that causes of mortality among 37 adult Yuma clapper rails attributed to predation in 36 cases (50% mammals, 22.2% avian, 27.8% unknown), and disease in 1 case.

**Migration:** Although some overwinter in breeding range (mild winters), most depart from breeding range by late September, and arrive back around March-April. Fly relatively long distances in short time, may be forced to migrate because of decrease in prey base. Left summering grounds by end of October (Anderson and Ohmart 1985). Presumed to migrate

south in September to west coasts of Sonora, Sinaloa, and Nayarit in Mexico. Proportion of birds that potentially migrated much less than previously hypothesized due to telemetry studies, in which a maximum of 30% of telemetered Yuma clapper rails migrated south to winter ranges. According to Eddleman (1989), most of population believed to migrate to Mexico during winter, however, due to recent radiotelemetry studies, over 70% of breeding population does not migrate, but winters along lower Colorado River. Reasons for migration centered on decline in available prey (mainly crayfish). Other hypotheses for causal mechanisms include historic low flows on Colorado River from August to September resulting in drying of habitat and persistence of migration instinct.

**Home Range:** Basic requirements of nest site availability, prey diversity and abundance, and protection from avian predators, all met within very small area of wet marsh, often no larger than 0.12 ha (0.29 ac). Home ranges of individuals or pairs, may encompass up to 43.0 ha (106.25 ac), but year-round home ranges averaged 7.50 ha (18.53 ac), (Rosenberg et al. 1991). Eddleman (1989) estimated home ranges for Yuma clapper rails, based on vocalizing birds, as being 0.1-1.62 ha (0.24-4.00 ac) for paired birds and 0.73-3.59 ha (1.80-8.87 ac) for unpaired birds. Observed females had smaller home ranges than males during late breeding, incubation, and early winter; however, had larger home ranges than males during post breeding, probably due to increased foraging effort because food base more sporadically distributed or because the available prey in the breeding home ranges may be depleted. In work done almost entirely in lake and delta cattail marshes at Topock Marsh, Smith (1974) determined an overall density estimate of 1 pair of clapper rails per 13.5 ha (33.36 ac) or 1 rail per 6.8 ha (16.80 ac). Todd (1980) found overall density estimate of 1 pair per 2.06 ha (5.09 ac) or 1 rail per 1.03 ha (2.54 ac), on 77 ha (190.27 ac) Mittry Lake, which is comprised mainly of cattail marshes. In 1981, 42 Yuma clapper rails found on Hall Island (in Colorado Indian Reservation on CA side of river) for a density of 1 rail per 0.32 ha (0.79 ac). Occasionally, home range of Yuma clapper rails in lacustrine and delta marshes, extends 52 m (56.88 yd) or farther from shore. Movements of Yuma clapper rails beyond established home ranges were of 5 basic types: dispersal of juveniles, dispersal during the breeding season by unpaired males, movements of post breeding adults, movements during late winter, and home range shifts associated with high water (Eddleman 1989).

**REPRODUCTION:** First breed after establishing breeding territories, around March-April; distant localities may occur later in early May. Territory dependent on food base, available nest sites, and competition from other clapper rails. Highly territorial during breeding season, both sexes defending territory. Energy reserves, particularly in female, may determine when egg laying actually begins. Average clutch size for *longirostris* species 8 to 10 eggs, yellow-buff to green-buff, irregularly blotched or spotted with brown. Will re-nest if eggs lost. Incubation begins after last egg laid (lay 1 per day), lasts about 21-23 days. All hatch within 24 hour period. Hatching success usually high, but mortality among young also high. Family groups of clapper rails stay together for about 24-30 days post hatching. Chicks become independent of parents at 35-42 days post hatching, with first flight occurring 63-70 days post hatching (Terres 1980).

Most eggs hatch during first week of June. Despite long breeding period, only 1 clutch of 6-8 eggs, unless clutch lost. Precocial young follow adults through marsh within 48 hours of

hatching. Adults lead young to productive feeding grounds. Quickly learn to feed on their own (Rosenberg et al. 1991).

**FOOD HABITS:** On lower Colorado River, introduced crayfish (for use as fish bait) are most common food consumed in bulk except on delta where insect and fish consumption prevail. Prefer crustaceans including amphipods, but also take fish, frogs, clams, spiders, grasshoppers, crickets, dragonflies, aquatic plant seeds, and bird eggs etc. Forage mainly while walking on prevailing substrate, including; mud flats, sandbars, recumbent stems of marsh plants, and between stems of marsh plants etc. (Todd 1986). Rosenberg et al (1991), believes that crayfish abundance may be a limiting factor in determining Yuma clapper rails occurrence today. Seasonal shifts in habitat use by crayfish may affect use of habitats by the rails. In contrast to findings of Bennett and Ohmart (1978), crayfish present year-round by Eddleman (1989), suggesting that populations of Yuma clapper rails may be supported in breeding range during winter.

**HABITAT:** This is only clapper rail to breed in freshwater marshes; also inhabit brackish water marshes and side waters. Prefer tallest, densest cattail and bulrush marshes (Rosenberg et al. 1991). Most found within the Lower Colorado Subdivision of the Sonoran Desertscrub biome. Todd (1986) reported that "average annual rainfall in Yuma clapper rail habitat is usually less than 12.70 cm (5.00 in). Average daily July temperature exceeds 32$^{o}$C (89.6$^{o}$F) along Colorado River and most of the Gila River west of Phoenix. Winters relatively mild, with January temperatures for Yuma and Gila Bend averaging about 12.8$^{o}$C (55.0$^{o}$F). Territories appear to be distributed along zone where standing water gives way to saturated soil within marsh. Interface between water, soil and vegetation seems far more important than plant species that cover site. Water in preferred sites usually is <30.0 cm (11.82 in) in depth. Few deep water sites used; include Topock Marsh, Bill Williams Delta, Cibola Lake and Mittry Lake. As soon as ground surface of marsh dries out, clapper rails move elsewhere. Plants that typify *yumanensis* habitat include cattail (*Typha domingensis*) is most dominant, and most important plant in water saturated soil interface in U.S. portion of Lower Colorado River Drainage. Often associated with giant bulrush along the Colorado River. Giant bulrush (*Scirpus californicus*) occurs mostly in pure stands, though it also mixes with cattail. Capable of invading and persisting in somewhat deeper water than cattail, and produces mat of recumbent stems that clapper rails use. Common reed (*Phragmites australis*) marshes are mainly inhabited by Yuma clapper rails where bordered or mixed with cattail. Salt cedar (*Tamarix chinensis*), as minor associate of cattail, does form part of the cover used by territorial Yuma clapper rail in some areas. Appearance in cattail marsh indicates drying trend at soil surface, or local high spot in the marsh.

Most over-wintering Yuma clapper rails found in heavily overgrown, relatively narrow, wet sloughs and backwaters. Have more varied vegetation cover of mature and decadent herbaceous and woody vegetation than do lacustrine marshes. Sloughs, especially of smaller size, seem to be important during breeding season, where Have been found in cattail or bulrush choked sloughs. Eddleman (1989) reported that micro-habitats during the breeding season includes sites with <30.0 cm (11.82 in) of water, vegetation that is optimally >40.0 cm (15.76 in) tall, and marshes with interface between upland and marsh habitats, or with higher

sites within marsh. Stable water levels important during nesting. Mosaic of variable-aged stands of emergent vegetation interspersed with shallow open-water pools are necessary for year-round clapper rail habitat (Conway et al. 1993).

Nests usually built in dense vegetation near water's edge or, if available, on small high site within marsh. Commonly nest along channels where banks slightly higher than adjacent marsh areas. Such nests are often placed beneath woody shrubs or small trees or in clumped herbaceous growth. Nests elevated over vegetation or soil, have runways leading into them that rails habitually use. Nests 18.0-24.0 in (45.72-60.96 cm) tall, 8.0-12.0 in (20.32-30.48 cm) above mud, well cupped and 7.0-10.0 in (17.78-25.4 cm) across, consisting of dry sedges and grasses (Terres 1980). Changes that determine habitat suitability include: rapid accretion from flood, bed scour and channel shifting, elevation of riverbed (determines seasonal and annual persistence of backwaters and sloughs), and volume and rate of water flow.

**ELEVATION:** Below sea level at Salton Sea to 396 m (1,300 ft.) east of Phoenix at Salt River. Based on records in the Heritage Data Management System (HDMS), elevation ranges from 75 - 1,700 ft (23 - 519 m) (AGFD, unpublished data accessed 2001).

**PLANT COMMUNITY:** Lower Colorado Subdivision of the Sonoran Desertscrub biome. Fresh water marshes consisting mainly of cattails, bulrushes and to a lesser extent, common reed.

**POPULATION TRENDS:** Summer U.S. populations between 1960's and mid-1970's, averaged about 900-1,000 individuals. As many or more occurred on Colorado River delta in Mexico until the late 1970's (Todd 1986). In 1991, between 700-1,000 individuals per population (Rosenberg et al. 1991). Historically, population was localized in Yuma area before 1940. Present population estimate in Lower Colorado River Valley is estimated to be between 400-750 individuals in the U.S. and 450-970 in Mexico (Rosenberg et al. 1991). Habitat of breeding Yuma clapper rails in Mexico never completely surveyed, but an estimated 1,000 birds occurred in early 1970's. Number may be lower today due to extensive flooding since 1979 (Eddleman 1989). Anderson (1983) states that survey results in U.S. and Colorado River delta of Mexico since 1969, indicate that population is fairly stable at about 1,700-2,000 birds.

## SPECIES PROTECTION AND CONSERVATION

**ENDANGERED SPECIES ACT STATUS:** LE (USDI, FWS 1967)

**STATE STATUS:** WSC (AGFD, WSCA in prep)
[State Threatened AGFD, TNW 1988]

**OTHER STATUS:** No FS Status (USDA, FS Region 3 1999)
[Forest Service Sensitive USDA, FS Region 3 1988]
Group P (Secretaria de Desarrollo Social 1994)

**MANAGEMENT FACTORS:** **Threats:** habitat destruction through river channelization, dredging, and drying and flooding of marshes; wildfires; toxic levels of heavy metals (selenium). **Management needs:** maintain and enhance marsh habitat; maintain constant flows through lower Colorado River dams sufficient to retain breeding habitat; monitor distribution and abundance of breeding birds; monitor heavy metal content in eggs and/or tissue. (AGFD in prep).

Were adapted to sometimes sudden appearance and disappearance of large and small channels and lagoons; but man's alterations of water volume and channel directions limit amount of habitat suitable to rails. Construction of flow-impeding dam on Colorado River has two major impacts on clapper rail habitat: 1) it curtails annual snowmelt flows to the delta, thus depriving wetlands of periodic underground and surface recharge, 2) inundation of floodplain sloughs and backwater marshes by water impoundment, thus rendering those areas unsuitable for clapper rails. Other impacts of water impoundments include; 1) increased water volumes due to snowmelt or high precipitation, virtually eliminating woody vegetation along the banks, 2) channelization and dredging, to protect floodplain real estate by stabilizing river channels, flood control, decreasing ground seepage and evaporation losses, and 3) improving delivery of water to municipal and agricultural users.

They seem resistant to pesticides, but prey base (including crayfish) is vulnerable. Selenium pollution from farmland wastewater has been identified as causing heavy mortality in waterbirds on Kesterson National Wildlife Refuge, and should be of concern when managing for Yuma clapper rails (Todd 1986). Selenium is essential trace element, naturally occurring in shale rock and soil. High levels have adverse effects on egg production, should be monitored in Colorado River system. Can accumulate in backwaters, should be consistently monitored to prevent problems in clapper rail populations (mainly prey base). No point sources of selenium occurred in Lower Colorado Valley; however agriculture, coal mining, and erosion in the upper basin, are potential sources for selenium contamination in the Lower Colorado Valley. Yuma clapper rail management must be based on a systematic, continuing monitoring program.

Management options should be oriented toward preferred habitat perpetuation. Fundamental criteria of standards for all sites should include the presence of: 1) dense vegetation (60.0 cm or more) on wet site with water depths of 30.0-40.0 cm (11.82-15.76 in) from November to August, 2) low vegetated hummocks or rises above water adjacent to or within marsh or swamp, 3) adequate food base. Given ephemeral nature of habitat at any one site, and ease with which it is destroyed by floods and man, should be minimum of 20 localities established for Yuma clapper rail management. Each site should be suitable for minimum of 8 pairs of clapper rails, with overall average of 15 pairs per locale (Todd 1986).

**PROTECTIVE MEASURES TAKEN:** Radio telemetry studies have been used and should continue to investigate migration and winter range.

**SUGGESTED PROJECTS:** Winter range and migration; location and status of winter habitats. Studies on migration needed to identify critical stop-over sites and significant mortality factors along migration route. Studies should include Colorado River delta. Once wintering grounds located, habitat threats and mortality factors at most significant sites must be determined by long-term on-site studies. Telemetry studies of wintering range and migration should continue to be used to facilitate investigations of breeding ecology, such as: habitat preferences, size of home range and territories, daily activity patterns, nest placement, post-fledging movements, food habits, nesting success etc. (Todd 1986).

Concerted effort must be made to identify several water-engineering projects or wildlife mitigation habitat manipulations for long-term monitoring, to determine impacts on Yuma clapper rails. In addition, an annual aerial photographic-survey should be conducted under Federal Aid Project W-95-R, to monitor and document habitat conditions and trends along the Colorado River and at selected locations along the lower Gila River (Todd 1986).

**LAND MANAGEMENT/OWNERSHIP:** BLM - Kingman, Phoenix, Tucson and Yuma Field Offices; BOR - Phoenix Area; FWS - Cibola, Havasu and Imperial National Wildlife Refuges; USFS - Tonto National Forest; BIA - Colorado River Reservation; State Land Department; AGFD - Arlington Wildlife Area and Mittry Lake; Private.

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**ADDITIONAL INFORMATION:**

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