

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Animal Abstract

Element Code: ABNGA02010

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Ixobrychus exilis*

COMMON NAME: Least Bittern; Dwarf Bittern, Least Heron; Little Bittern, Western Least Bittern

SYNONYMS: *Ardea exilis*, *Ixobrychus exilis hesperis*

FAMILY: Ardeidae

AUTHOR, PLACE OF PUBLICATION: *Ardea exilis* Gremlin, Syst. Nat., vol. 1, pt. 2, 1789, p. 645. Based on Minute Bittern of Latham, Gen. Syn., vol. 3, pt. 1, p. 66. (in Jamaica). (AOU 1957).

TYPE LOCALITY: Jamaica.

TYPE SPECIMEN: Unknown.

TAXONOMIC UNIQUENESS: The eight species of *Ixobrychus* found worldwide are morphologically very similar. The Least Bittern of the Americas, Little Bittern (*I. minutus*) of western Eurasia and Africa, and the Yellow Bittern (*I. sinensis*) of the Far East probably comprise a superspecies (Payne and Risley 1976, Hancock and Kushlan 1984, in Gibbs et al. 1992, revised 2008). The subspecific taxa for *Ixobrychus exilis* has not been evaluated critically or quantitatively, except for those named in the United States and northwestern Mexico (Dickerman 1973, in Gibbs et al., 1992, Revised 2008 by Patten). For Neotropical taxa, Blake (1977, in Gibbs et al. 1992, Revised 2008 by Patten) is the sole source with diagnoses of all subspecies. *I. e. exilis* (Gmelin, 1789) includes *I. e. hesperis* Dickey and van Rossem; western United States. *I. e. pullus* van Rossum, 1930. Ranges in Southern Sonora and is a diagnosably smaller bird than birds in western United States (Dickerman 1973); recorded south to Guerrero (migrant?). North America, *erythromelas* in Central and South America, *pullus* in nw. Mexico, *bogotensis* in w. Columbia, and *peruvianus* in w. Peru (Hancock and Kushlan 1984, in Gibbs et al. 1992). In North America, Least Bittern's were historically classified into eastern (*exilis*) and western (*hesperis*) subspecies (Palmer 1962, in Gibbs et al. 1992), but recent data on plumage and morphology do not support this dichotomy (Dickerman 1973, in Gibbs et al. 1992 and BISON 2000).

Recent studies indicate that there are no morphological differences between the eastern and western subspecies, thus tracking at full species (1996 DR). According to Troy Corman (4/27/2009), "After conducting a little more literature review, it appears there continues to be some debate as to whether Western (*hesperis*) is a valid subspecies. Therefore, we (AGFD)

should continue to track them at the species level and any new data submitted (even if noted as "Western") should be included only to species."

DESCRIPTION: This species is the smallest member of the heron family, measuring 28-36 cm (11-14 in), weighing around 80 g, and with a wingspan of 43 cm (17 in). Their contrasting color patterns are diagnostic field patterns. The crown, back, and tail are a vivid greenish black. The neck, sides, and underparts are brown and white. Wings are chestnut with conspicuous, contrasting, pale patches. The head is slightly crested, the bill is thin and yellow, and the iris is yellow. (Gibbs et al. 1992). Bitterns have a laterally compressed trunk, short legs, short outer toes, and long, curved toenails that enable them to travel through and grasp the dense, emergent vegetation (NatureServe 2001). Legs are green on front, yellow behind; soles of feet are yellow. Pale, highly visible lines border scapular feathers. Sexes are similar in size, but plumage is dimorphic. The crown and back of the female is purple-chestnut; those of the male are black. The neck of the female is darkly streaked. Juvenile plumage is like that of the adult female but the juvenile's crown is paler and browner; breast and throat is browner with heavier streaking. In a rare, darker morph, known as Cory's Least Bittern, the pale areas of the typical plumage appear chestnut colored. (Gibbs et al. 1992).

AIDS TO IDENTIFICATION: Although both the American (*Botaurus lentiginosus*) and Least Bittern are diurnal and often breed at the same wetland, competition may be minimal between the two species due to differences in microhabitat used for foraging, prey preferences, nest site requirements, and breeding phenology. Generally speaking, least bitterns prefer more densely vegetated, deeper-water habitats than do American bitterns for foraging and nesting, and take smaller prey. (Gibbs et al. 1992). No other small heron has large buffy patches on the upper side of the otherwise dark wings (NatureServe 2001). Other similar species: 1) Rails lack buff wing patches, and lack strong pattern. 2) The Green Heron (dark wings; *Butorides virescens*) is sometimes mistaken for the Least Bittern; Green Heron often perches in trees. 3) The American Bittern is much larger than the Least Bittern (Peterson 1990).

ILLUSTRATIONS:

Color drawing (Peterson, 1990: page 115)

Color photo (Gibbs et al., 1992: page 1)

Color photo of female and nestlings (<http://animaldiversity.ummz/> 2001)

Color photo (eNature.com, 2001)

Color photo (Farrand, 1988: page 128)

Color drawing (National Geographic, 1999: page 57)

Color photos (Terres, 1980)

TOTAL RANGE: **Breeding:** Breeds from se. Canada through the U.S. and Mexico to Costa Rica (Blake 1977, AOU 1983, fig. 1, in Gibbs et al. 1992).

Winter: The species ranges south of areas with prolonged winter frosts: along the Atlantic coastal plain from Maryland and Virginia south to Louisiana and Texas, with peak numbers in s. Florida, along the Rio Grande valley, the lower Colorado River, and Baja California (Gibbs

et al. 1992). Also winters in southern California, Arizona, Nevada, Greater Antilles, and Central America (NatureServe 2001).

RANGE WITHIN ARIZONA: Year-round resident in southwestern Arizona, mainly in the lower Colorado Valley. Most birds depart Arizona for the winter (Todd 1987). Generally, most breeding season observations in Arizona are for localities under 5,500 feet elevation in the southwest and southcentral parts of the state (Todd, 1987). Least bitterns have been confirmed breeding in dense cattail marshes along the lower Colorado River, a few localities along the Salt and Gila rivers, Picacho Reservoir, and (south of Safford) Dankworth Ponds (AGFD 1996 in prep, *in* BISON 2000; also in Monson and Phillips 1981).

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: *Ixobrychus exilis* migrates between temperate breeding grounds and temperate and subtropical wintering grounds. Migrants leave breeding grounds late August through September; few birds found north of Gulf States past mid-October. They return early April to late May, depending on latitude. They usually clamber through dense vegetation. Often moving deliberately from stalk to stalk, grasping vegetation with their toes, but they can run quickly, hop nimbly, and burrow rodentlike through vegetation. They seemingly fly weakly; flutter short distances when flushed, legs dangling, and drop quickly back into vegetation. (Gibbs et al. 1992).

Least Bitterns are quite vocal, with a varied repertoire of calls. Males utter a dovelike cooing, frequently heard in spring, which is thought to advertise their presence. Females reported to respond with ticking calls (Hancock and Kushlan 1984, *in* Gibbs et al. 1992). A *gack-gack* call commonly given from nest (Weller 1961, *in* Gibbs et al. 1992). When alarmed, a loud, shrieking *quoh*, a hissing *hah*, a *tut-tut-tut*, or a cackle may be expressed (Palmer 1962, Hancock and Kushlan 1984, Swift et al. 1988, *in* Gibbs et al. 1992). *Ank-ank* call given when flushed from marsh (Weller 1961, *in* Gibbs et al. 1992). Defensive posture and interactions between mates may be accompanied by a call of *gra-a-a* (Weller 1961, *in* Gibbs et al. 1992). They are vocal in early morning, and perhaps more vocal at dawn than dusk (Swift et al. 1988, *in* Gibbs et al. 1992), but they are generally silent at midday and in the afternoon.

Predation of Least Bittern reported by Gibbs et al. (1992): "Snapping turtles (*Chelydra serpentina*) and Red-tailed Hawks (*Buteo jamaicensis*; Trautman 1940, Weller 1961) prey on adults. Snakes, turtles, crows, raptors, and racoons (*Procyon lotor*) eat chicks and eggs (Bent 1926, Weller 1961, Hansen 1984). Marsh Wrens (*Cistothorus palustris*) may puncture Least Bittern eggs (Bent 1926), and mink (*Mustela vison*) may take eggs and nestlings (de Vore 1968 *in* Hancock and Kushlan 1984)".

REPRODUCTION: There is little information on sexual behavior of *Ixobrychus exilis*, but they are probably solitary and monogamous; no detailed information on duration of pair bond, but likely only seasonal (Weller 1961, Palmer 1962, *in* Gibbs et al. 1992). They are generally solitary or in pairs during nesting season, but occasionally breed semicolonial near abundant

food sources. Least bitterns are highly insectivorous, thus delayed breeding may be related to the life cycles of aquatic prey. Emergence of aquatic insects in temperate zone wetlands begin in April but peak in June (Orians 1980) when food demands of parenting least bitterns probably are highest. (Gibbs et al 1992). They generally breed in April or early May, after returning from their southern U.S. wintering grounds, although nesting common in June-July in north-central U.S. (NatureServe 2001). In California, eggs are laid mid-April to early July (Terres 1980). May is the peak period for egg laying in Arizona (Todd, 1987).

Typically, nests are built among dense, tall stands of emergent or woody vegetation. Nests usually are 15-76 cm above water 8-96 cm in depth, and <10 m from open water, channels, or openings made by muskrat (*Ondatra zibethicus*; Nero 1950, Kushlan 1973, McVaugh 1975, Aniskowicz 1981, in Gibbs et al. 1992). Nests are a platform 15-20 cm in diameter, 5-12 cm thick, formed by bending down live and dead stalks and adding short stems and sticks on top. Incubation averages 17-20 days, and begins with either the 1st or 2nd egg; both sexes incubate eggs. Clutch size is 2-7, usually 4-5; eggs are pale blue or pale green. The semialtricial young hatch asynchronously over a 3-4 d period (Weller 1961, Palmer 1962, in Gibbs et al. 1992). Both parents feed the young at the nest. Egg tooth is present at hatching until at least the 16th day. Young are able to hold out wings on the 3rd day, grasp with their feet and assume "bittern stance" on the 4th day, and leave the nest temporarily on the 5th day (Nero 1950, Weller 1961, in Gibbs et al. 1992). Fledging occurs by 13th-15th day, with fledglings lingering nearby for 1-2 weeks.

FOOD HABITS: Generally consume small fish, and insects. Major food items include: small fishes, including top minnows (*Fundulus*), mud-minnows (*Umbra*), sunfishes (*Centrarchidae*), and perches (*Perca*). They also consume snakes, frogs, tadpoles, salamanders, leeches, slugs, crayfish, insects (mainly *Odonata* and *Orthoptera*), small mammals (shrews and mice), and vegetative matter (Warren 1890, Bent 1926, Howell 1932, Weller 1961, Palmer 1962, in Gibbs et al 1992). Feeds young by regurgitation. The Least Bittern uses relatively few foraging tactics. It will stand very still, waiting for prey to get within striking range. Alternatively, it will walk slowly after prey items, or use wing-flicking to startle them. Some individuals will build foraging platforms in particularly good hunting spots.

HABITAT: **Breeding:** freshwater and brackish marshes with dense, tall growths of aquatic or semiaquatic vegetation (particularly *Typha*, *Carex*, *Scirpus*, *Sagittaria*, or *Myricus*) interspersed with clumps of woody vegetation and open water. Occasionally in salt marshes and mangrove swamps. (Gibbs et al. 1992). **Winter:** occurs mainly in brackish and saline swamps and marshes (Palmer 1962, Hancock and Kushlan 1984, in Gibbs et al. 1992), but little is known about wintering range.

ELEVATION: Elevation ranges between 850 - 1,500 ft. (259 - 458 m), based on unpublished records in the Heritage Data Management System (AGFD, accessed 2001).

PLANT COMMUNITY: **Breeding:** freshwater and brackish marshes with dense, tall growths of aquatic or semiaquatic vegetation (particularly *Typha*, *Carex*, *Scirpus*, *Sagittaria*,

or *Myriscus*) interspersed with clumps of woody vegetation and open water. **Winter:** occurs mainly in brackish and saline swamps and marshes.

POPULATION TRENDS: The species is often overlooked in large-scale surveys of bird populations because it is so secretive; hence data on population trends are contradictory and unclear. Populations apparently stable during the period of 1966-1989 along U.S. Fish and Wildlife Service Breeding Bird Survey (BBS) routes (Robbins et al. 1986, BBS unpubl. data), but Least Bitterns were observed on just 62 routes during that period. Data too few to assess populations in any state or province in North America (i.e., all had <10 usable routes), except Florida. (Gibbs et al. 1992). As of 1987, there were fewer than 100 nesting pair in interior Arizona, where large losses of habitat had occurred (Todd, 1987).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: SC - Subspecies (*I.e. hesperis*) formerly tracked as C2 (USDI, FWS 1991); removed in 1996.

STATE STATUS: WSC (AGFD, WSCA in prep)
[Candidate, AGFD, TNW 1988]

OTHER STATUS: Species Determined Threatened in Mexico (Secretaría de Medio Ambiente 2000)
Not BLM Sensitive (USDI, BLM AZ 2010)
[Bureau of Land Management Sensitive (USDI, BLM AZ 2008)]

MANAGEMENT FACTORS: Destruction of wetland habitat is likely the greatest threat to the species; over 4.75 million acres of palustrine wetlands were lost between the mid-1950s and mid-1970s (Tiner 1984, *in* Gibbs et al. 1992). If wetlands remain undisturbed and unpolluted, however, Least Bitterns seem tolerant of human presence, and may persist in highly urbanized areas. Siltation resulting from erosion of farmlands, and run-off containing insecticides, may degrade nesting habitats and reduce food supplies in agricultural areas. (Gibbs et al. 1992).

Preservation, protection, and improvement of wetland habitats for Least Bitterns, particularly large (>10 ha), shallow wetlands with dense growth of robust, emergent vegetation, is the most urgent conservation need. Wetlands also need to be protected from chemical contamination, siltation, eutrophication, and other forms of pollution. (Gibbs et al. 1992). Wetlands with equal ratios of cover to open water are preferred, so wetland managers may need to periodically reverse vegetative succession while maintaining suitable habitats nearby to serve as alternate nesting areas during wetland manipulations (e.g. at other wetlands in a complex). Because bitterns occur in many states at wetlands managed by state and federal agencies for waterfowl, there is ample opportunity for making minor alterations to existing management schemes to improve nesting habitat. For example, dense stands of cattail and

bulrush, often eliminated with cutting, burning, or flooding treatments to improve waterfowl habitat, can be partially retained as habitat. (NatureServe 2001).

As indicated above, **threats** include: degradation and destruction of marshlands through channelization, dredging, flood-control, riparian overgrazing, stream diversions, and wildfire. **Management needs:** maintain and enhance cattail/bulrush marsh habitat; maintain constant flows through lower Colorado River dams sufficient to retain breeding habitat. (AGFD, in prep).

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Basic research on nesting biology, movements, population dynamics, and overwintering biology would help to clarify the status of the species and facilitate its conservation (Gibbs et al. 1992).

LAND MANAGEMENT/OWNERSHIP: BLM - Phoenix Field Office; State Land Department; Private.

SOURCES OF FURTHER INFORMATION

REFERENCES:

- American Ornithologists' Union (AOU). 1957. Check-list of North American Birds. Fifth Edition. AOU, Port City Press, Inc. Baltimore, MD. Pp. 52-53.
- Arizona Game and Fish Department (AGFD). 1988. Threatened Native Wildlife in Arizona. Arizona Game and Fish Department Publication. Phoenix, Arizona. P. 18.
- Arizona Game and Fish Department (AGFD). In prep. Wildlife of special concern in Arizona. Arizona Game and Fish Department Publication. Phoenix, Arizona. 32 pp.
- Biota Information System of New Mexico (BISON). 2000. BISON Species Account 040036, Western Least Bittern: *Ixobrychus exilis hesperis*. New Mexico Game and Fish, Sante Fe, NM. Accessed 2001: http://www.fw.vt.edu/fishex/nmex_main/species/040036.htm.
- eNature.com. Field Guide: Least Bittern, *Ixobrychus exilis*. Accessed 2001: <http://www.enature.com/fieldguide/....>
- Farrand, Jr., J. 1988. Western Birds. McGraw-Hill Book Company. New York. P. 128.
- Gibbs, J.P., F.A. Reid, and S.M. Melvin. 1992. Least Bittern. *In* The Birds of North America, No. 17 (A. Poole, P. Stettenheim, and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, DC: The American Ornithologists' Union. http://animaldiversity.ummz.umich.edu/media/washtenaw_audubon/bird2_094.jpg.
- Monson, G. and A.R. Phillips. 1981. Annotated Checklist of the Birds of Arizona. Second Edition. The University of Arizona Press. Tucson, Arizona. P. 10.
- National Geographic. 1999. Field Guide to the Birds of North America. Third Edition. National Geographic Society. Washington, D.C. Pp. 56-57.
- NatureServe: An online encyclopedia of life [web application]. 2001. Version 1.5. Arlington, Virginia, USA: Association for Biodiversity Information. Available: <http://www.natureserve.org/>. (Accessed: October 2, 2001).

- Peterson, R.T. 1990. A Field Guide to Western Birds. Third Edition. Houghton Mifflin Company. Boston, MA. Pp. 114-115.
- Secretaría de Medio Ambiente. 2000. Diario Oficial de la Federación, PROY-NOM-059-ECOL-2000. P. 29.
- Terres, J.K. 1980. The Audubon Society Encyclopedia of North American Birds. Alfred A. Knopf. New York, New York. P. 496.
- Todd, R. 1987. Nongame Field Note - Least Bittern. Arizona Game and Fish Department, Phoenix, Arizona.
- USDI, Bureau of Land Management Region 2. 2008. Arizona BLM Sensitive Species List.
- USDI, Bureau of Land Management Region 2. 2010. Arizona BLM Sensitive Species List.
- USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 56(225): 58811.
- USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa That Are Candidates for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 61(40): 7596-7613.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

- James P. Gibbs - School of Forestry and Environmental Studies, Yale University, New Haven, CT 06511.
- Dr. Scott M. Melvin - Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program, Westboro, MA 01581.
- Dr. Frederic A. Reid - Ducks Unlimited, 9823 Old Winery Place, Suite 16, Sacramento, CA 95827.

ADDITIONAL INFORMATION:

Species name: *Ixobrychus exilis* (icks-oh-BRYE-kus or icks-OBE-rih-kus ex-EYE-liss); genus name: from Greek *ixos*, mistletoe, but in application to birds, taken to mean reed, and Greek *brycho*, *bryko*, to roar or bellow (Jaeger, 1955); species name: Latin, slender, small (Terres 1980).

Revised: 2001-11-02 (SMS)
2004-01-07 (SMS)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department. 20XX (= **year of last revision as indicated at end of abstract**). X...X (= **taxon of animal or plant**). Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.