

## Research Packet A

Student Resource (1 of 9)

Use the provided resource from the online Montana Field Guide to complete the poster.



### American Bullfrog - *Lithobates catesbeianus*

Other Names: Bullfrog



#### Aquatic Invasive Species

#### Non-native Species

Global Rank: G5

State Rank: SNA

(see State Rank Reason below)

#### State Rank Reason (see State Rank above)

A conservation status rank is not applicable because this species is not a suitable target for conservation activities as a result of being exotic or introduced.

### General Description

Adult American Bullfrogs are a large frog usually pale to dark green or brownish-green with darker spots or blotches above; the underside is cream to yellowish with gray mottling. A series of black bands often extends across the legs. Body length may reach 8 inches. American Bullfrogs do not have ridges running along the sides of the back, but have prominent ridges running from the eyes over the external ear drums to the shoulders. Egg masses (a one- to-two-egg-thick film of thousands of eggs) may reach several feet across. Tadpoles, which grow to a length of 4.5 inches, are olive-green with numerous black spots above and white or cream with varying amounts of dark mottling below. American Bullfrogs are not native to Montana.

### Diagnostic Characteristics

As sexual maturity approaches in males the upper abdomen temporarily turns yellowish in color (Flores-Nava, 2005). American bullfrogs have conspicuous tympanic membranes (eardrums). Mature males have tympanums twice the diameter of the eye, while mature females have tympanums about the same diameter as the eye (National Research Council, 1974). Males are also slightly smaller than females and have darkly pigmented thumb pads in contrast to the more delicate streamlined thumb of the female (National Research Council, 1974).

### Species Range

#### Montana Range

See the map to the right.



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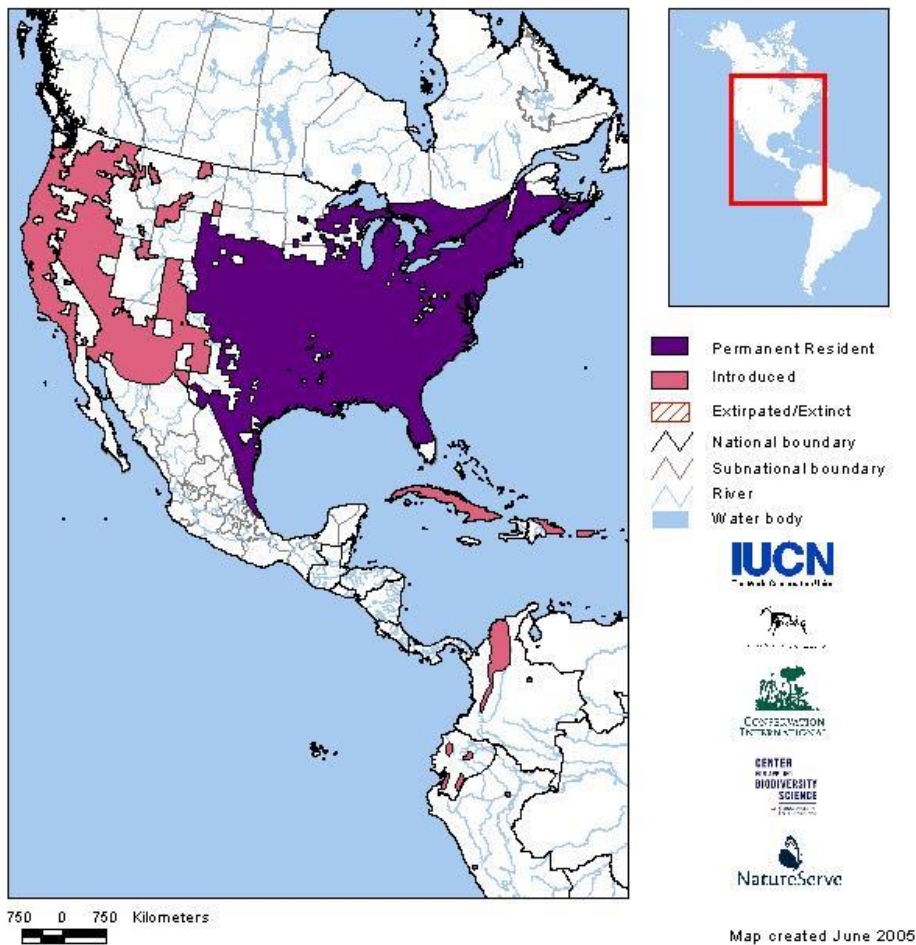
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## Most Unwanted AIS Poster

Student Resource (2 of 9)

### Western Hemisphere Range



### Range Comments

Native Range: Eastern United States to Minnesota and eastern Colorado south to Texas, but historically absent from the Cape Cod archipelago and associated islands off the east coast.

Introduced Range: From Washington, northern Idaho and Montana on the westslope of the continental divide in Colorado, New Mexico to Nevada, California and Arizona in the south.

Montana's Bitterroot River and Flathead River basin populations have been established since the 1960's (Werner et al. 2004), but the Yellowstone River populations have been a later introduction (2000's) with the epicenter being in Billings and expansion downstream (Sepulveda et al. 2015).

### Observations in Montana Natural Heritage Program Database

Number of Observations: 463

### Migration

Adult and juvenile bullfrogs may migrate overland to find other suitable aquatic habitats, if their existing wetland or pond habitat dries or is undergoing desiccation.

### Habitat

American Bullfrogs are found in lakes, ponds, cattle tanks, bogs, oxbow wetlands and sluggish portions of streams and rivers. American Bullfrogs are rarely seen far from the water's edge and are usually in the water. They are associated with larger bodies of quiet water; such as ponds, lakes, or backwaters of streams, usually in areas with extensive cattails or reeds. Their loud, deep "jug o'rum" call can be heard from a considerable distance. American Bullfrogs are voracious feeders, eating anything smaller than themselves, including ducklings, fish, mice, frogs, and small turtles. They have been implicated in extirpations of native frogs and turtles, and declines in waterfowl production. They are found in ponds, wetlands and rivers in the valleys. In the Northwest they have so far been unable to invade colder, higher elevation waters.



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## Ecological Systems Associated with this Species

- Details on Creation and Suggested Uses and Limitations
- Commonly Associated with these Ecological Systems

### Recently Disturbed or Modified

- Introduced Riparian and Wetland Vegetation

### Wetland and Riparian Systems

- Emergent Marsh, Great Plains Floodplain, Great Plains Riparian
- Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland, Open Water

- Occasionally Associated with these Ecological Systems

### Wetland and Riparian Systems

- Alpine-Montane Wet Meadow

## Food Habits

Introduced adult bullfrog populations consume birds, rodents, frogs, snakes, turtles, lizards, and bats. Larvae are herbivorous on aquatic algae and plants and can have a significant impact upon benthic algae, and have the potential to disturb aquatic community structure. Adults are voracious eaters who will also prey on their own young. In Oklahoma, the diet in ponds was (percent by weight) predominantly insects (82) (mostly Coleoptera, Orthoptera, Hemiptera), and crayfish (6). In streams the diet was mostly crayfish (73) and insects (25) (mostly Coleoptera).

## Ecology

Found in lakes, ponds, cattle tanks, bogs, oxbow wetlands and sluggish portions of streams and rivers. They breed in late-June and July producing 10,000 to 20,000 eggs. Tadpoles transform to adults as quickly as 4 months in warmer climates and up to 3 years in colder locations. In colder climates, bullfrogs require year-round persistence of water for tadpoles to mature and over-winter. American Bullfrogs may be affecting *R. pipiens* and *R. pretiosa* populations in the Bitterroot Valley. Suitable ponds are now occupied solely by American Bullfrogs.

## Reproductive Characteristics

In Montana, American Bullfrogs breed during warm weather in late-June and July. Females can produce 10,000 to 20,000 eggs. Eggs hatch in about 4 or 5 days. Tadpoles transform as quickly as 4 months in warmer climates and up to 3 years in colder locations. The tadpole stage may last 2-3 years in Montana based on Bitterroot and Yellowstone River studies. American Bullfrogs reach sexual maturity in 4 to 5 years. Eggs were observed in western Montana in early July. Tadpoles were observed metamorphosing into juvenile frogs in early June.

## Management

Current management for the Yellowstone River populations has been to try and eliminate as many populations as possible to prevent further spread. Not much management has taken place in the Bitterroot Valley where bullfrogs have virtually wiped out native amphibians from many of the low valley ponds and wetlands.

## Threats or Limiting Factors

Desiccation or drying of the wetland habitats before tadpoles metamorphose to adults is the limiting factor to bullfrogs. Based on a study in western Washington, conservation of ephemeral wetlands will halt range expansions of bullfrogs. Permanently inundated wetlands and man-made ponds are more likely to house the non-indigenous amphibian.

## Citation for data on this website:

American Bullfrog — *Lithobates catesbeianus*. Montana Field Guide. Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. Retrieved on March 27, 2020, from <http://FieldGuide.mt.gov/speciesDetail.aspx?elcode=AAABH01070>

Use this citation for your reference list!



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### Literature cited on the Montana Field Guide American Bullfrog website:

- Flores Nava, A. 2018. Cultured Aquatic Species Information Programme. *Rana catesbeiana* (Shaw, 1862). Cultured Aquatic Species Information Programme. In: Food and Agriculture Organization of the United Nations Fisheries and Aquaculture Department [online]. Rome. Updated 9 February 2005. [Cited 15 August 2018].
- National Research Council. 1974. Amphibians. Guidelines for the breeding, care and management of laboratory animals. National Academy of Sciences, Washington, D.C. 162pp.
- Sepulveda, A. J., M. Layhee, D. Stagliano, J. Chaffin, A. Begley, and B. Maxell. 2015. Invasion of American bullfrogs along the Yellowstone River. *Aquatic Invasions*. Volume 10, Issue 1: 69–77
- Werner, J.K., B.A. Maxell, P. Hendricks and D.L. Flath. 2004. *Amphibians and Reptiles of Montana*. Mountain Press Publishing Company: Missoula, MT. 262 pp.



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