

# IOWA CONSERVATIONIST

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## Log Rolling, a Pleasurable and Profitable Pastime

By H. H. KNIGHT

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The fisherman in search of bait or the entomologist in search of insect specimens may often resort to rolling old logs for collecting purposes. The writer has been rolling logs periodically during the past 25 years, chiefly in search of insects while conducting field trips with classes in entomology. With this background as an introduction we will proceed with the subject in hand.

Within and beneath old logs we find a varied assortment of animal life, in fact we find one of the important ecological situations in wooded areas. The age of a log and the species of tree it represents are chief factors determining what may be in or under the log examined. Biologists have studied logs from the viewpoint of ecological succession of the organisms which reduce the freshly fallen log through decay and disintegration until it becomes a part of the soil.

The recently fallen log does not press evenly on the soil but generally leaves spaces here and there where animals may crawl beneath. After a few years lying on the ground a log gradually becomes partially imbedded in the soil and consequently fewer animals find a home there.

When collecting insects we generally look beneath the logs which are very little imbedded in the soil. However, the fisherman in search of earthworms may find the older logs more productive, especially when dryness of soil has driven the worms deeply underground in more exposed places.

Most animals of the woodland may at one time or another seek protection under logs. One al-

(Continued to Page 26, Column 1)

## Iowa State Parks Provide Relaxation From Stress and Strain of War Effort



Iowans are fortunate in these times of travel difficulties to have state parks and recreational areas so located that every citizen in the state lives within 40 miles of at least one of them.

## Iowa's Frogs and Toads

By REEVE M. BAILEY

### PART II

The first part of this article was devoted to certain general features of the natural history of Iowa's frogs and toads; their hibernation, reproductive behavior, metamorphosis, seasonal appearance, habitat, food, conservation, and study. This section is designed to serve as a guide to identification by means of a key, and a description and illustration of each form. In addition, there are presented for each species

descriptive notes on the song, geographic occurrence, and preferred habitat in Iowa. The reader in search of more detailed information, or who wishes to familiarize himself with frogs and toads from other areas, is referred to a recent (1942) general handbook, "The Frogs and Toads of the United States and Canada", by A. A. Wright and A. H. Wright<sup>1</sup>. To this volume there is appended an excellent bibliography.

(Continued to Page 27, Column 1)

<sup>1</sup>Available from Comstock Publishing Co., Inc., Ithaca, New York (\$3.00).

## No Iowan Farther Than 40 Miles from Recreational Spot

By G. L. ZIEMER

Chief, Lands and Waters Division

It is often said that a nation at war must see that its people—all of its people—get healthful recreation, diversion, and relaxation to promote individual health and national morale. With each succeeding day of war this fact becomes more evident. Regardless of what phase of the current struggle a person is engaged in, he is a more efficient worker for Uncle Sam if periodically he is released from the high mental and physical tension of war work.

It is generally agreed that one of the most satisfying tonics for both body and spirit is found under the spring sky's blue canopy in the open, in close communion with Mother Nature's birds and flowers, her bright sunshine and warm breezes. Here truly do LeRoy Titus Weeks' lines

"The sweet, warm lips of early spring come full upon my own;

They softly press and fondly cling like lips that I have known.

Her garments touch me here and there, by wanton breezes stirred;

My forehead feels her rippling hair, like plume of passing bird"

find satisfactory interpretation.

Iowans are indeed fortunate in these times of travel difficulties that their state parks and recre-

(Continued to Page 26, Column 3)



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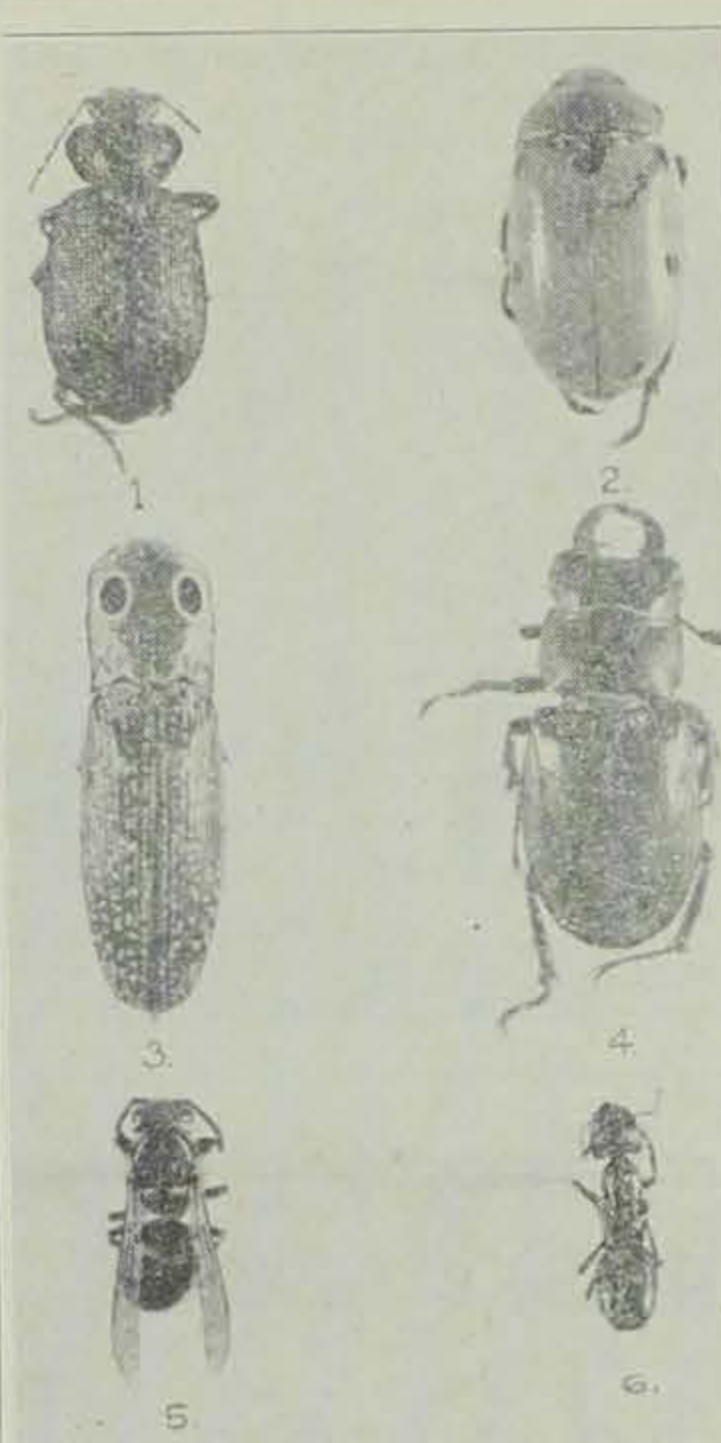
## Log Rolling

(Continued from Page 25)

ways gets a thrill when unexpectedly a bull snake or other common snake is uncovered suddenly. I once uncovered a copperhead under similar circumstances so one must be careful in regions where they occur.

Field mice, especially the white-footed mouse, make runways beneath logs and one may pop out when least expected. The white-footed mouse often makes its nest in well rotted logs and in spring-time you may flush out a hapless mother with three or four young clinging to her underside.

Probably the greatest variety of animals will be found among the jointed-leg types such as millipedes, centipedes, spiders, pillbugs and insects. In Missouri and points south one may frequently find the black widow spider be-



The study of animal life under decaying logs is a fascinating pastime. Some of the interesting creatures that may be found are shown in this illustration: (1) *Calosoma calidum*; (2) spotted *Pelidnota*; (3) "eyed-elater"; (4) stag-beetle; (5) yellow-jacket; (6) black carpenter ant.

neath logs, and this one should be treated with respect. However, the several species of millipedes and centipedes appear harmless to man. Among the insects found under logs the greatest number of species will prove to be Carabidae or ground beetles. One large type is *Calosoma calidum* (fig. 1), black with green spots on the wing covers. This species roams around at night, feeding on caterpillars such as cutworms, often climbing trees to get canker worms when in season. One may often find ladybug beetles, especially the red and black spotted species, which congregate in large numbers beneath certain logs for hibernation. In fact, many insects seek out logs for hibernation, hence early spring is the best time to find them present. In Iowa one may find three species of large white grubs developing in rotting logs and the adult beetles occur in or on the logs during June and July. One of these scarabs is the spotted *Pelidnota*, (fig. 2); it is brown in color with eight black spots above near side margins.

Perhaps the most remarkable beetle found in Iowa is the "eyed-elater" (fig. 3), an elongate black and gray beetle about two inches long, having imitation eye marks on the thorax; it belongs to the wireworm family (Elateridae). The larvae or grubs of this large beetle bore and feed chiefly in decaying poplar and willow logs.

Stag-beetles (fig. 4), noted for the large mandibles which resemble horns, are generally

found about logs and stumps in July, while the grubs which bore in punky logs may be found at other times.

Yellow-jackets (fig. 5), make paper nests in hollow logs and stumps, and during the winter the hibernating queens may be found in rotting logs where they crawl in for protection. Hibernating queens of the bald-faced hornet may also be found in logs but in spring they move out to build the large paper nests one may see hanging from limbs of trees (disturb with care). The large black carpenter ants (fig. 6), found in or on logs, excavate extensive tunnels in punky wood and aid materially in reducing old logs to soil. Many other kinds of insects too numerous to mention may be found living in or under fallen trees. So we find in winter as well as summer the fallen tree trunks, or logs on the ground, furnish home, food or cover to a greater variety of animals than any other single type of object in the landscape.

May we suggest for the benefit of animal life as well as the man who may follow you, when rolling logs please put them back where you find them.

## Iowa State Parks

(Continued from Page 25)

ational areas are so located that every citizen in the state lives within 40 miles of at least one of them. This is a distance easily reached by gasoline allotted on an A card. Pooling with a neighbor and with a full carload it is possible for most people to visit an area several times during the year.

Special effort has been made to make your visit to the recreational areas enjoyable, and in spite of labor shortages the state parks are in first class condition, with picnic areas fully equipped with tables, benches, fireplaces, firewood, water supplies, and sanitary facilities.

Practically all of the state areas were originally selected for their outstanding natural attractions. Undeveloped timber, imposing geological formations, panoramas of native flowers and ferns, magnificent overlooks of outstanding scenic beauty—all add to the recreational value of the parks. Through most of them nature trails have been constructed along easy grades which can be followed on foot. On many of the trails the outstanding features are pointed out and explained by inconspicuous markers.

Most of Iowa's recreational areas have lakes or streams, and many have extensive beach developments with boats available for fishing and boating.

Lodges, (reserved through the resident park custodian) are available for group parties in sixteen parks and all are equipped

for picnics. Many have cooking equipment.

Organized camping for groups, such as Boy Scouts, 4-H Clubs, Campfire Girls, and other organizations, are available at Lake Ahquabi, Dolliver Memorial, Palisades Kepler, and Springbrook State Parks. In these group camps are buildings for sleeping, administration, central dining, and recreational facilities. These camps are fully equipped for use except for bedding and linen, which each group must provide.

Sites are available in practically all the parks for tent and trailer camping for those who wish to "camp out". These areas are equipped with water supplies and sanitary facilities. Other materials must be provided by the individual for his own use. Reservations for trailer or tent camping sites can be made with the custodian in the area.

Sixty-six overnight family cabins are available in nine of the parks for vacation use. Each accommodates four persons and is fully equipped with cooking utensils, beds, davenport, chair, and toilet, etc. Bedding and linen must be furnished by the user. For cabin information address inquiries to the State Conservation Commission, 10th and Mulberry, Des Moines.

## Game Surplus Receives Commission's Attention

Fluctuating game crops often cause situations to arise that need to be dealt with by state conservation departments independent of the legislature, and for this reason certain powers have been delegated to our Conservation Commission.

Law-making bodies convening once in two years or even once a year are obviously unable to cope properly with such circumstances as surpluses of game remaining after regular open seasons. By surplus we mean excess of game beyond the carrying capacity of the land and without undue damage to field crops, trees or vegetation.

Proper game takes are difficult to control even with pre-season surveys because weather conditions, number of hunters in the fields and other factors may determine the amount of game remaining after open seasons.—L. D. Parker, Davenport Times.

## More About Frogs

What a wonderful bird the frog are—

When he stand he sit almost  
When he hop, he fly almost  
He ain't got no sense hardly  
either

He ain't got no tail hardly either  
When he sit, he sit on what he  
ain't got, almost hardly!

—Unknown.



## Frogs and Toads

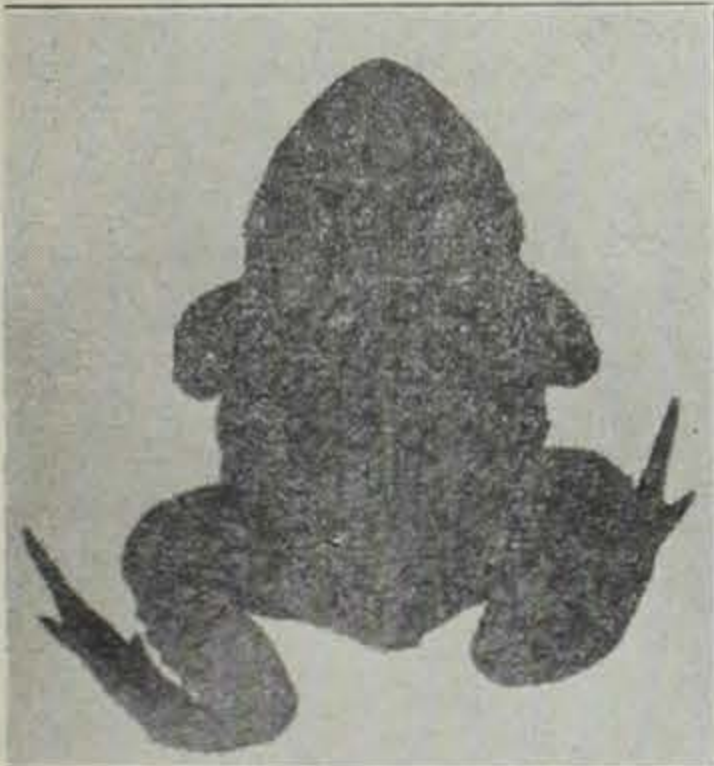
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raphy to the literature of American frogs and toads.

### TOADS

#### FAMILY BUFONIDAE

Toads are the most terrestrial of tailless amphibians. Their skin is dry and thickened and covered with enlarged warts. The belly is coarsely granular. There are enlarged swellings behind the eyes known as the parotoid glands, and two lengthwise ridges or cranial crests between the eyes. The body is chunky or robust, the waist broad, and the legs short. The toes are poorly webbed. Each hind foot is provided with two enlarged, darkened digging tubercles. The single vocal pouch of the male is located on the throat. The thumbs of adult males are not swollen. The skin of toads, as of frogs, is poisonous if eaten, but toads may be handled with impunity, and do not cause warts. All of our toads metamorphose at a length of only about one-half inch.



AMERICAN TOAD (0.5x)

*Bufo americanus americanus* Holbrook

**IDENTIFICATION.** — Size moderate, body length usually about three inches, occasionally four or more. Warts very large. Breast and belly more or less heavily spotted or mottled with dark. Parotoid glands large, broad, closely approximated, kidney-shaped; their width usually more than half their length. Spots on back without conspicuous light edges, each with one or two (occasionally three or four) warts. Ridges between eyes not uniting to form a knob.

**SONG.** — A high-pitched, protracted, musical trill; usually of from 10 seconds to a minute in duration. Heard mostly from mid-April until early June.

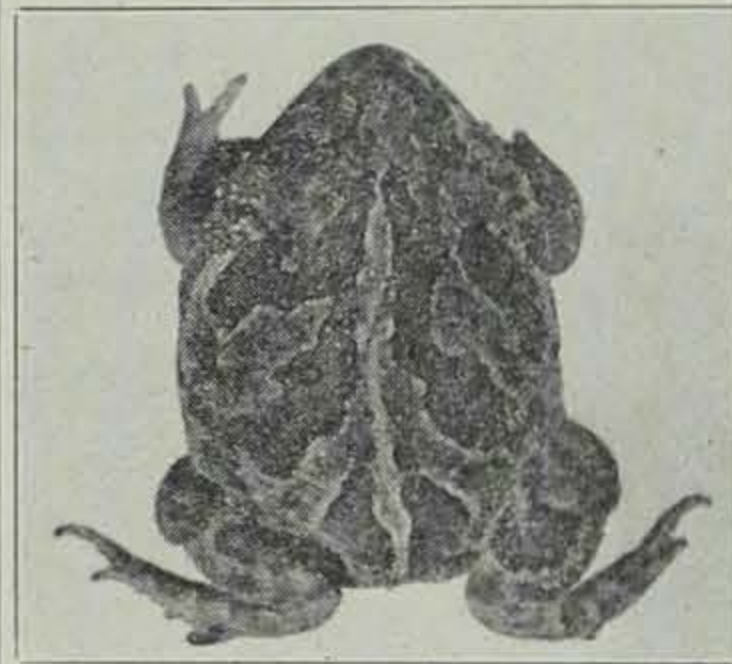
**IOWA RANGE.** — Almost statewide; not found in the Missouri River valley. It occurs commonly in both bottomland and upland areas.

#### GREAT PLAINS TOAD

*Bufo cognatus* Say

**IDENTIFICATION.** — Size moderate, body length less than four inches. Warts smaller than in

other Iowa toads. Breast and belly unspotted. Parotoid glands small, oval, widely separated, their length much less than distance between them. Blotches on back conspicuously light margined, each surrounding many

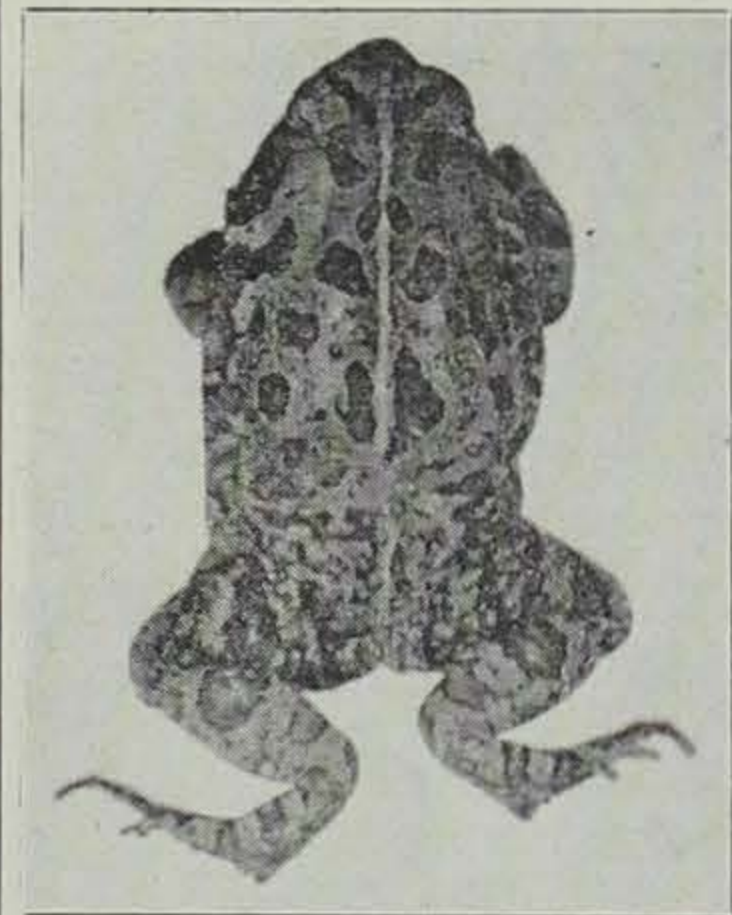


GREAT PLAINS TOAD (0.6x)

(not less than seven) warts. Ridges between eyes heavy, converging sharply to unite in a knob between front border of eyes.

**SONG.** — Beginning as a musical trill, the notes become hard and loud, producing a whirring staccato somewhat like a musical riveting machine. The song is protracted, continuing for from 15 seconds to over half a minute. Heard most frequently after rains in May and June.

**IOWA RANGE.** — The western two tiers of counties; taken in Osceola, O'Brien, and Montgomery counties in addition to all counties bordering the Missouri and Big Sioux rivers. Living in both bottomland and upland areas.



FOWLER'S TOAD (0.8x)

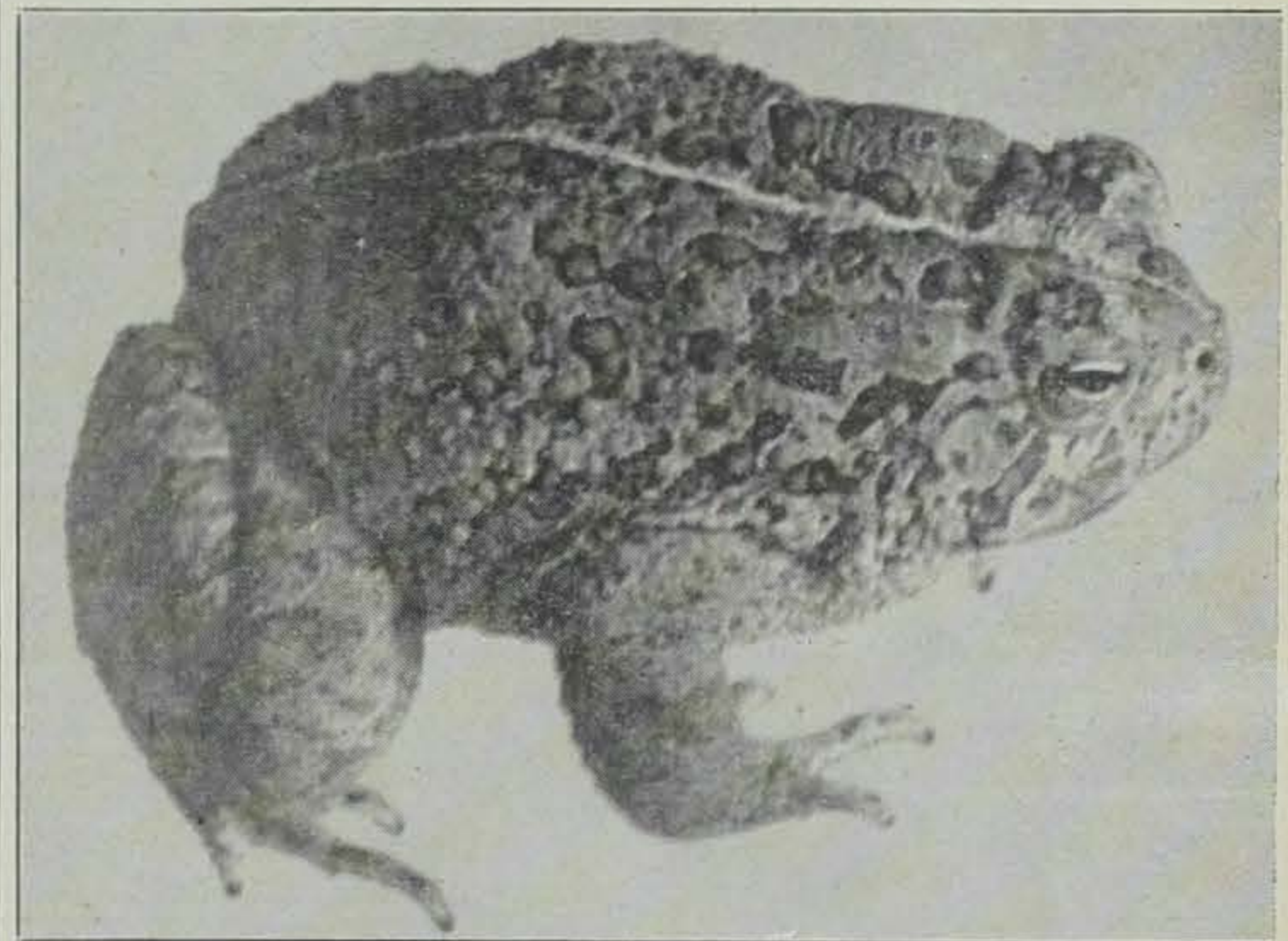
*Bufo woodhousii fowleri* Hinckley

**IDENTIFICATION.** — The smallest of Iowa toads, body length usually about two and one-half inches but reported to reach three and one-fourth inches. Warts of moderate size. Belly unspotted; breast unspotted or with one or a few dark spots. Parotoid glands longer than the distance separating them, elongate-oval in shape, their width usually more than half their length and always more than half the distance separating them. Ground color of back light, but dark spots with-

out conspicuous light borders. Dark spots usually surrounding three or four (occasionally one, two, five, or more) warts. A conspicuous light stripe along midline of back. Ridges between eyes weak (absent in small specimens), not uniting to form a knob.

**SONG.** — A rather low-pitched nasal "waa-a-a-a", of less than five seconds duration. Very similar to the call of the Rocky Mountain toad, but more musical. Most commonly heard from May to July.

**IOWA RANGE.** — Known only from the southeastern portion of the state, in Jefferson, Lee, Muscatine, and Van Buren counties. It lives in lowland areas.



ROCKY MOUNTAIN TOAD (Natural Size)

*Bufo woodhousii woodhousii* Girard

**IDENTIFICATION.** — The largest of Iowa toads, body length of adults usually three to four inches, reported to reach four and three-fourths inches. Warts of moderate size. Belly unspotted; breast unspotted or with one or a few dark spots. Parotoid glands at least as long as the distance separating them, long and narrow, their width usually less than half their length and typically less than half the distance separating them. Dark spots on back not conspicuously light margined; usually surrounding one or two (occasionally three to five) warts. A clear-cut light stripe along midline of back. Ridges between eyes moderately developed, parallel, not uniting to form a knob.

**SONG.** — A low-pitched nasal "wää-ä-ä-ä", of less than five second duration. Similar to that of Fowler's toad, but somewhat more raucous. Most often heard in May and June.

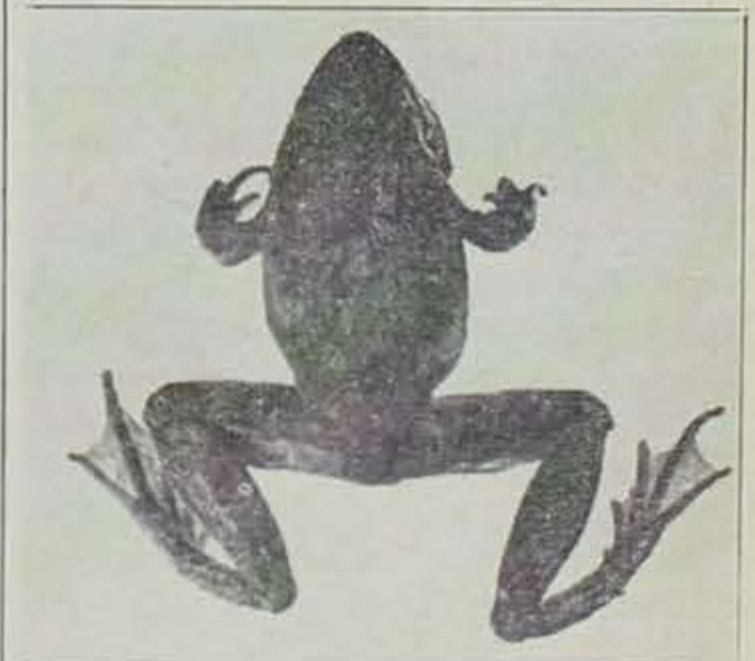
**IOWA RANGE.** — Western two tiers of counties, north to Plymouth County. Abundant in the Missouri River valley together with the Great Plains toad. Chiefly an inhabitant of stream bottomlands.

### TREE FROGS

#### FAMILY HYLIDAE

These are arboreal, semiaquatic and terrestrial frogs of small to moderate size; Iowa species do not exceed two and one-half inches in body length. The moist skin is smooth or provided with small warts; the belly is granular. There are no parotoid glands, cranial crests, or dorso-lateral folds. The body is slender to moderately robust, the waist narrow, the legs of varying length. The fingers may be scarcely or not at all webbed, and webs between the toes may be reduced or moderately to well developed. The tips of the fingers and toes are dilated, the expansions reaching their greatest development in

arboreal species. The hind foot is provided with one or two tubercles; these are not darkened or hardened for digging. Males have a single vocal pouch on the throat. The thumbs of adult males are not swollen. The tympanum is small. At metamorphosis common tree frogs measure from one-half to four-fifths of an inch in body length; the three other species from one-third to three-fifths of an inch.



NORTHERN CRICKET FROG (1.2x)

*Acris crepitans* Baird

**IDENTIFICATION.** — Size small, maximum body length about one and one-fourth inches. Body rather slender, snout sharp. Back and legs usually with many

(Continued to Page 28, Column 1)



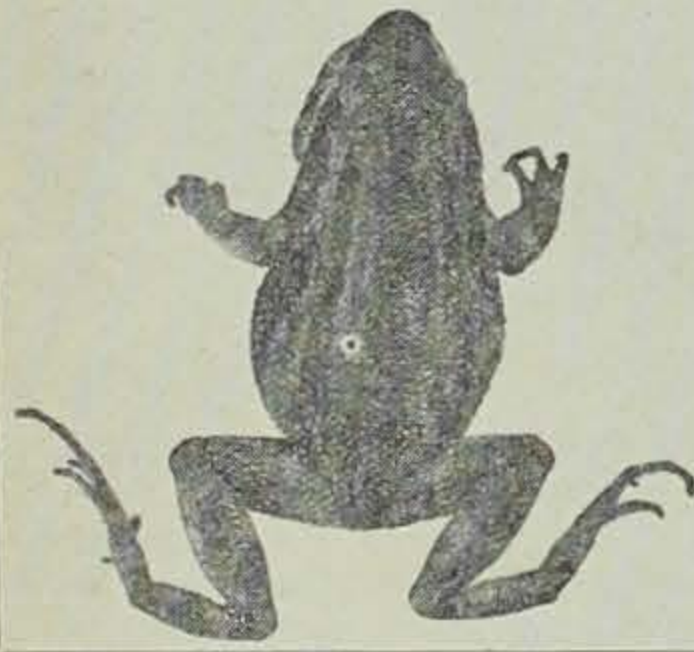
## Frogs and Toads

(Continued from Page 27)

small warts. Disks on fingers and toes very small. Legs long, when bent forward heel extends almost or quite to tip of snout; tibia about three-fifths body length. Fingers scarcely webbed at base; toes well webbed, shortest entirely included in web and longest with a single phalanx free. Upperparts dark olive or slate-gray, the middle of back often with a stripe of bright green, or reddish-brown or tan. Rear surface of thighs with a broad lengthwise dark stripe which contrasts sharply with lighter areas above and below.

**SONG.** — A rapid-fire succession of discrete metallic clicks, "kic, kic, kic, . . .", starting slowly and increasing in frequency. Singing begins in late April in southern Iowa, reaches its height during May and June, and continues intermittently into early August.

**IOWA RANGE.** — Virtually statewide, apparently absent from the Blue Earth drainage in Kosuth and Winnebago counties. Preferring shores of streams and lakes.



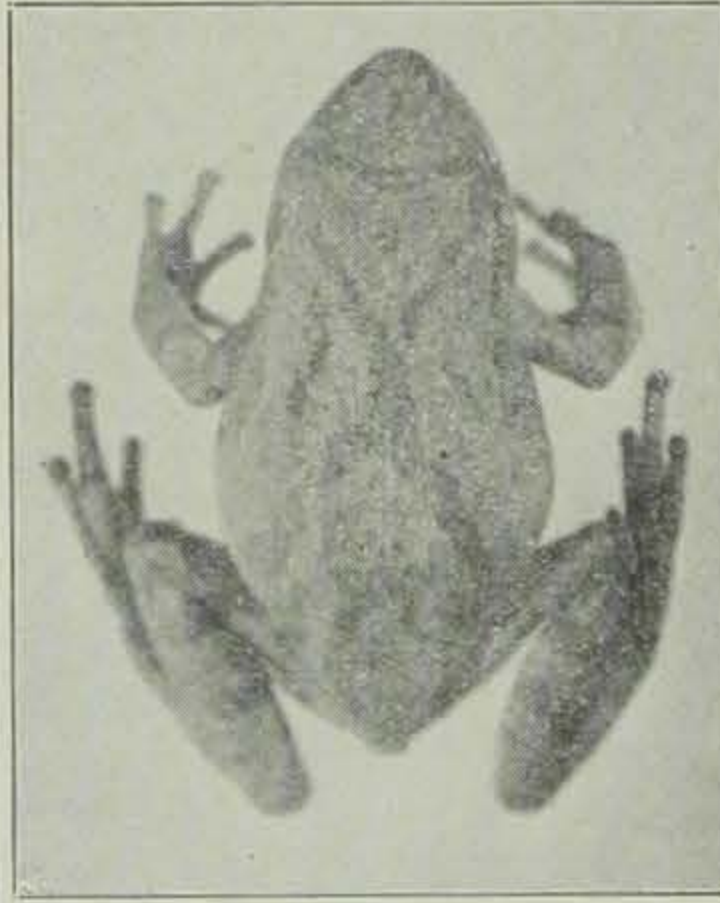
STRIPED CHORUS FROG (1.2x)  
*Pseudacris triseriata* (Wied)

**IDENTIFICATION.** — Size small, body length less than one and three-eighths inches. Body slender, snout sharp. Skin granular but without warts. Disks on fingers and toes very small. Legs short, when bent forward heel does not reach eye; tibia about two-fifths body length. Fingers free; toes poorly webbed, shortest toe with two phalanges free from web and longest with three and one-half to four phalanges free. Back with three lengthwise dark stripes, the center one extending forward onto snout; rarely the stripes are broken up into spots. A dark stripe extends from tip of snout backward through eye and eardrum onto side.

**SONG.** — A penetrating, grating series of notes with a progressive rising inflection. It has been compared with the sound produced by drawing a point strongly across a coarse comb, commencing at the bottom of a jar and bringing it rapidly to the mouth. Beginning on the first

warm days in March, the choruses reach their peak in April and occur intermittently until early August.

**IOWA RANGE.** — Abundant throughout the state. Found mostly in standing water and in adjacent low marshy areas.

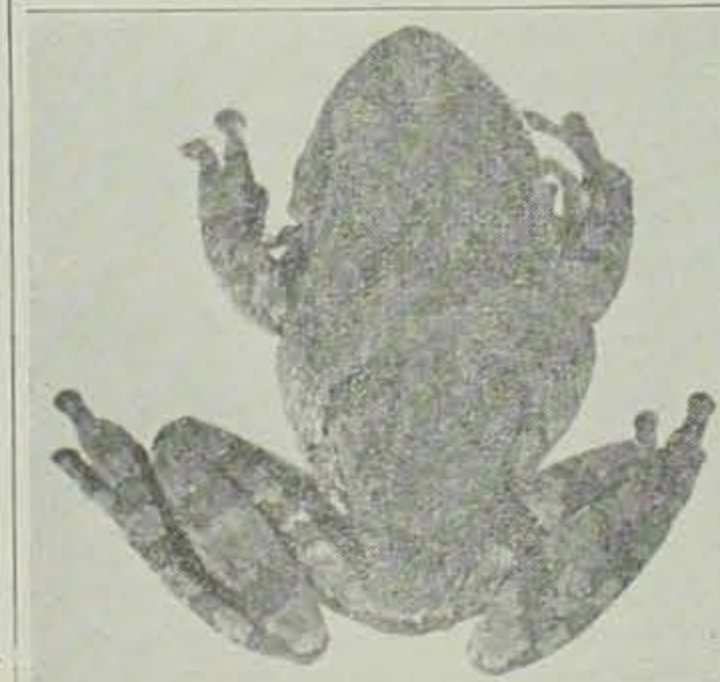


SPRING PEEPER (1.7x)  
*Hyla crucifer* Wied

**IDENTIFICATION.** — Size small, body length less than one and three-eighths inches. Skin smooth. Body moderately robust, head rather broad, snout rounded. Disks on fingers and toes well developed. Legs rather short, when bent forward heel reaches eye; tibia almost one-half body length. Fingers free; toes partly webbed, shortest toe with two phalanges free from web and longest with two or three phalanges free. Back tan or brown, with characteristic oblique cross of darker brown.

**SONG.** — A shrill, high, clear, single-note whistle; repeated at intervals. The call has a piercing quality, and the ears of a listener located in a strong chorus soon ring unpleasantly. The strongest choruses are heard from mid-March, in southern Iowa, to late April, in northern Iowa.

**IOWA RANGE.** — The eastern fourth of the state; known from Allamakee, Clayton, Jackson, Jefferson, Lee, Linn, Van Buren, and Winneshiek counties. Living in moist rich woodlands.



COMMON TREE FROG (0.9x)  
*Hyla versicolor versicolor* Le Conte

**IDENTIFICATION.** — Size moder-

A tree toad loved a she toad  
That lived up in a tree;  
She was a three-toed tree toad,  
And a two-toed toad was he.

The two-toed tree toad tried to win  
The she toad's friendly nod;  
For the two-toed tree toad loved the ground  
That the three-toed tree toad trod.

But vainly the two-toed tree toad tried—  
He couldn't please her whim;  
In her three-toed bower, with her V-toe power,  
The she toad vetoed him.

—The Forest Log, Salem, Oregon.

ate, body length of adults one and one-fourth to two and two-fifths inches. Skin granular. Form robust, head broad, snout bluntly rounded. Disks on fingers and toes large. Legs rather short, when bent forward heel reaches eye; tibia almost half body length. Fingers about one-third webbed; toes rather well-webbed, shortest toes with one phalanx free from web and longest with one to two phalanges free. Coloration extremely varied and changeable; back green, brown or gray, usually with an irregularly blotched pattern. A greenish-white spot below eye; back of thighs bright orange-yellow.

**SONG.** — A high-pitched, explosive, bird-like trill of about four-fifths second duration.

**IOWA RANGE.** — Generally common in the eastern and southern portions of the state, elsewhere confined to the larger wooded river valleys. Arboreal in habits.

### TYPICAL FROGS

#### FAMILY RANIDAE

The typical frogs are aquatic to largely terrestrial species of moderate to large size. The skin of the belly is smooth; that of the sides and back smooth or with a number of raised ridges and tubercles. A dorso-lateral fold is present in all our species except

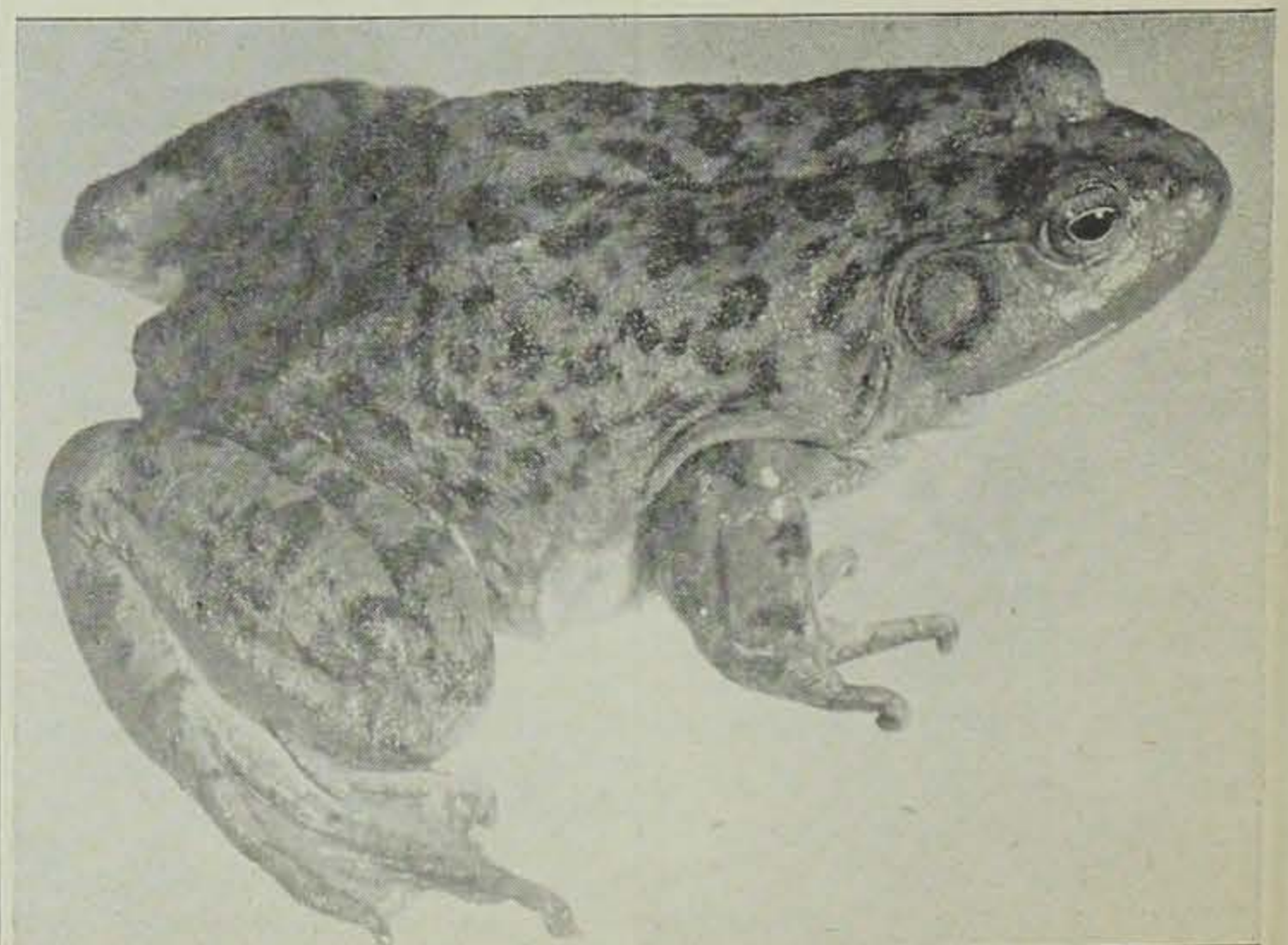
the bullfrog. There are no parotoid glands or cranial crests. The form is slender and moderately robust, the waist is narrow, and the legs are of moderate length, or long. The fingers are not webbed; the toes are always at least one-half webbed. There are no disks on the fingers and toes, and the one or two tubercles on the hind foot are not darkened or hardened for digging. Vocal pouches are internal or, if external, there is one on each side just above the forelimbs. Thumb of adult males markedly thickened at base. The tympanum is large. At transformation they vary in length from three-fourths inch to over two inches.

#### BULLFROG

*Rana catesbeiana* Shaw

**IDENTIFICATION.** — The largest of Iowa frogs, reaching a body length of over seven inches. No dorso-lateral fold (a ridge extends from eye backward then downward behind eardrum to near front of forelimb). Longest toe with only one phalanx free from the almost complete webbing. Legs of moderate length, tibia less than half body length. Skin of back roughened with small tubercles. Back with a few more or less indistinct dark spots; belly often heavily mottled with dark. The vocal pouches are internal.

(Continued to Page 29, Column 1)



BULLFROG (0.6x)



## Frogs and Toads

(Continued from Page 28)

**SONG.** — A deep, sonorous bass, **br-wum**, of exceptional carrying power. Heard from mid-April until July.

**IOWA RANGE.** — Probably originally confined to the southern two or three tiers of counties across the state and the Mississippi and lower Iowa rivers. Introduced in Boone, Greene, Polk, and probably other counties. Found in and near permanent ponds and streams.

## GREEN FROG

*Rana clamitans* Latreille

**IDENTIFICATION.** — Body length four inches or less. Dorso-lateral fold present, incomplete, extending only two-thirds to three-fourths distance from eye to groin. Longest toe with one and one-half to two phalanges free from the well developed webbing. Legs of moderate length, tibia less than half body length. Skin of back and sides roughened with many small tubercles and a few short ridges. Upperparts greenish-brown, often with some indistinct dark spots; sides of head bright green; undersurface white



GREEN FROG (0.6x)

or weakly mottled with dark; males with the throat bright yellow. The vocal pouches are internal.

**SONG.** — A single-noted, low-pitched, explosive "c'tung" or "clung", occasionally repeated several times in succession. The note has been compared to that produced by plucking the strings of a bass viol. Heard from late May through July.

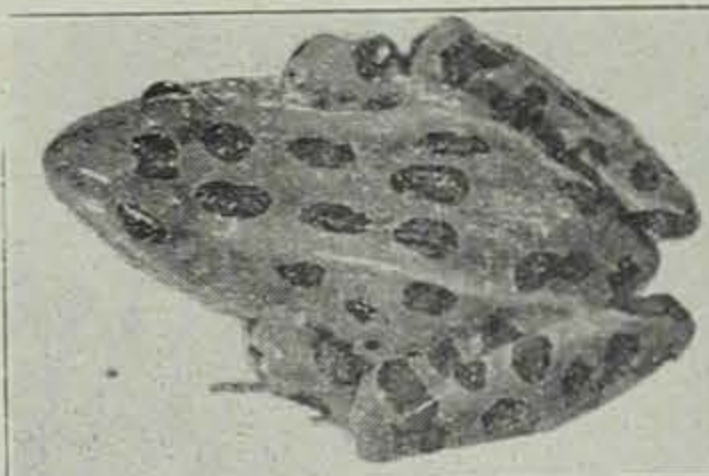
**IOWA RANGE.** — Most common in the northeastern and east central portions of the state west to the Cedar River basin; also found in the lower Iowa and lower Des Moines river valleys. It lives in and near permanent ponds and streams.

## LEOPARD FROG

*Rana pipiens* Schreber

**IDENTIFICATION.** — Body length

four inches or less. Dorso-lateral folds extending almost or quite to groin. Longest toe with two phalanges free from the well-developed webbing. Body slender; legs long, tibia decidedly more than half body length. Skin of sides and back roughened with many small tubercles and several elongate ridges, the latter best developed on back. Upperparts uniformly green, gray-green, or bronze; with many irregularly arranged, smoothly rounded dark spots, each set off clearly from the ground color. An occasional specimen lacks the dark spots. Belly and lower surfaces of legs white; throat white or with dark markings. A clear-cut light stripe on upper jaw from snout to below eardrum. Vocal pouches small,

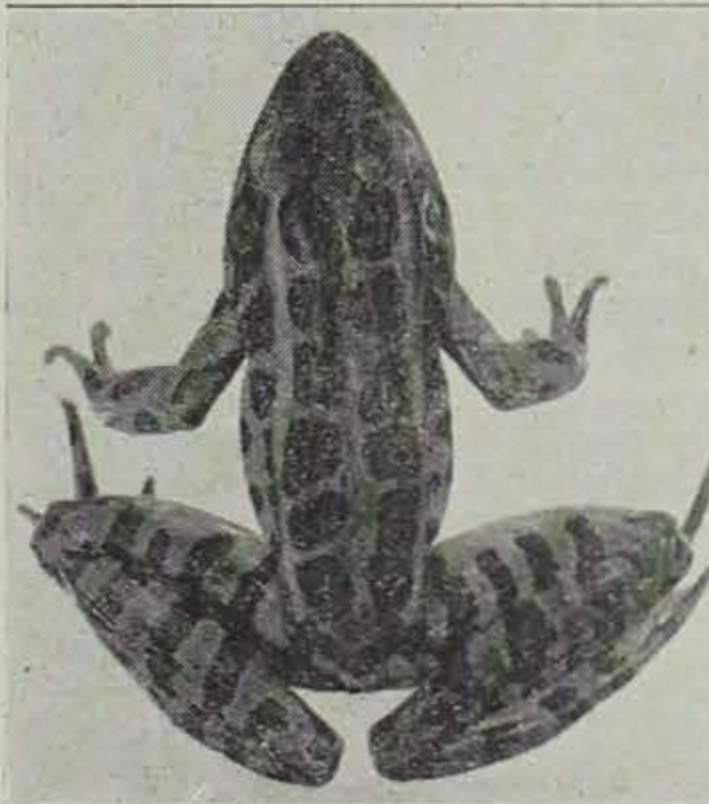


LEOPARD FROG (0.6x)

external, located between tympanum and arm.

**SONG.** — A low, growling note continued for several seconds, alternating with a series of short chuckles; either the longer note or the chuckles may predominate, so the choruses vary considerably. The chorus can often be described as a guttural laughter. Uttered at the surface or submerged, but in no case is the song loud or of great carrying quality. Heard from March until August; the strongest choruses usually occur in April and May.

**IOWA RANGE.** — The most abundant of the larger frogs; it occurs throughout the state. Common near permanent water, about ponds, and in marshes and low pastures.



PICKEREL FROG (0.8x)

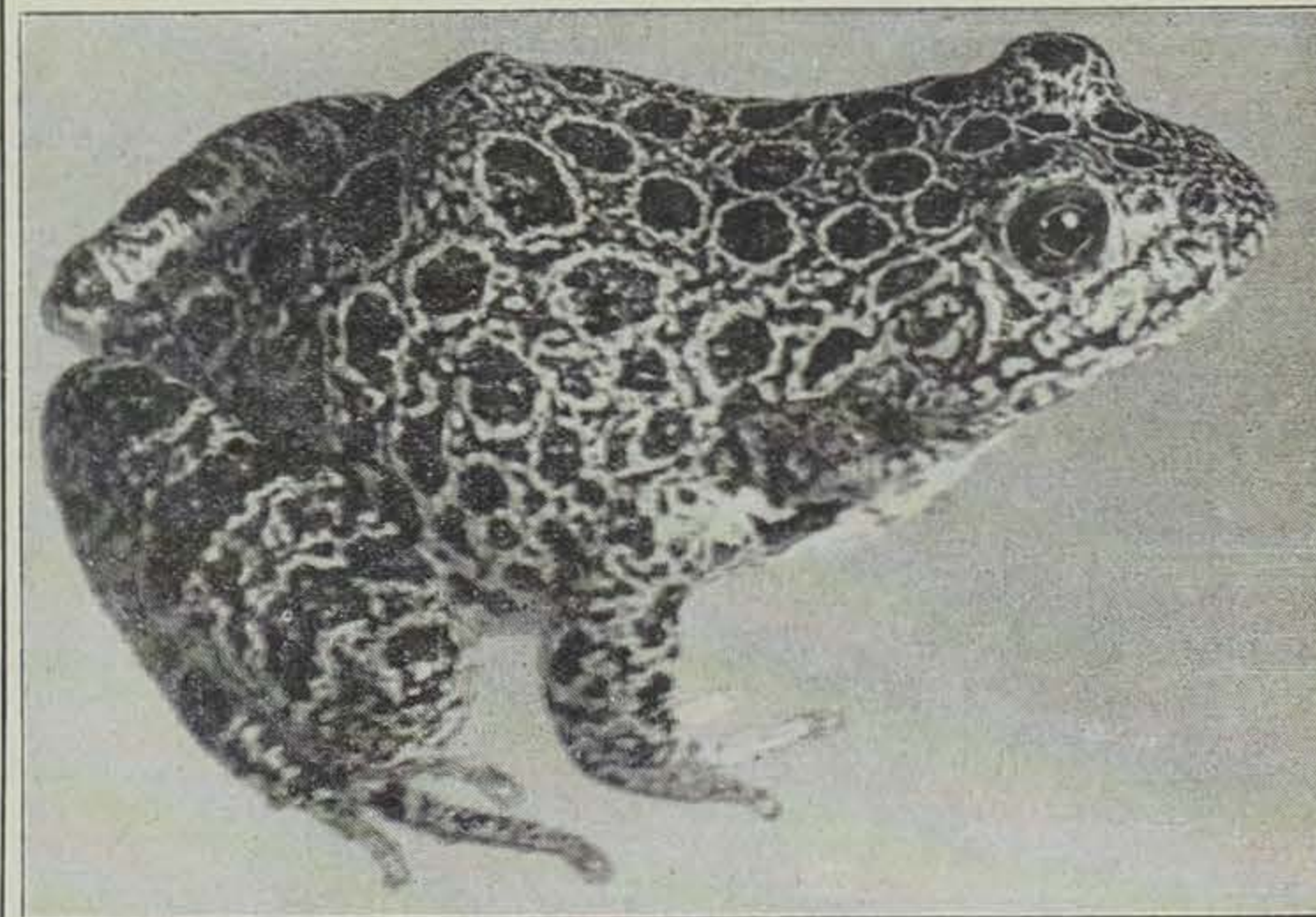
*Rana palustris* Le Conte

**IDENTIFICATION.** — Body length three and one-fourth inches or less. Dorso-lateral folds extending almost or quite to groin. Longest toe with two phalanges

free from the well-developed webbing. Body slender; legs long, tibia decidedly more than half body length. Skin of sides and back roughened with a few small tubercles and several elongate ridges, the latter usually restricted to back. Upperparts tending to be uniformly bronzed or brassy; usually with definite series of more or less rectangular spots, each set off clearly from the ground color. Belly white, groin and undersurface of hind legs bright yellow; edge of lower jaw with dark markings. A dark stripe from corner of eye to tip of snout, and a clear-cut light stripe on upper jaw from snout to below eardrum. Vocal pouches small, external, located between tympanum and forelimb.

**SONG.** — Low in pitch (but not so low as in the leopard frog) and weak in volume. It has been described as "a gently musical snore" and as a "low pitched grating croak". It is said to last about half a minute, and to be repeated at five minute intervals. They probably sing most in April and early May.

**IOWA RANGE.** — Found only in the eastern fifth of the state; known from Allamakee, Buchanan, Clayton, Delaware, and Louisa counties. Common near springs and cool streams. (See map.)



NORTHERN CRAYFISH FROG (Natural size)

*Rana areolata circulosa* Rice and Davis

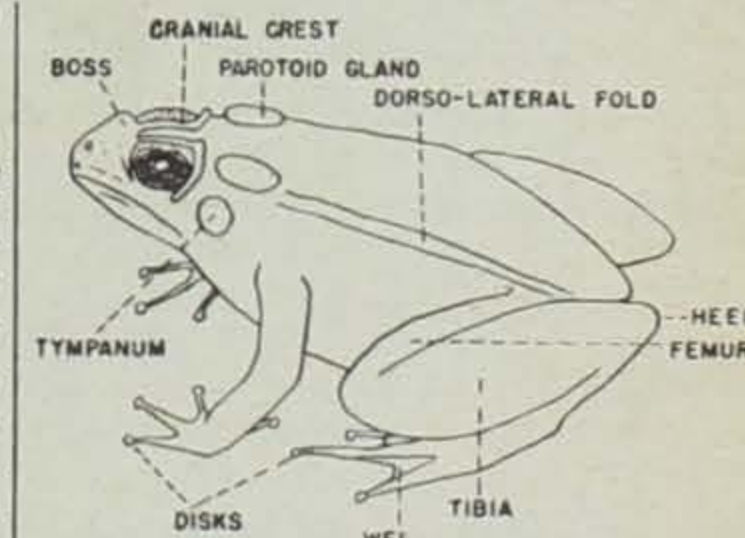
**IDENTIFICATION.** — A large frog, reaching four and one-half inches in length. Dorso-lateral folds extending almost or quite to groin. Longest toe with three phalanges free from the webbing, which is less well developed than in Iowa's other typical frogs. Body rather robust, the head broad; legs of moderate length, tibia less than half body length. Skin of back and, especially, sides coarsely roughened with ridges and large tubercles. Upperparts with many light-margined, more or less circular spots; the ground color between spots

not uniform, but heavily mottled or reticulated with dark. Belly white. Upper jaw and snout mottled with dark and light, with no clear-cut light stripe from snout to below tympanum. Vocal pouches of males prominent, external, located between tympanum and forelimb.

**SONG.** — A deeply sonorous and resonant "w-a-a-ah"; loud and of exceptional carrying quality. From mixed choruses this stands out above the others; clearly audible for over half a mile. The strong choruses are heard in April.

**IOWA RANGE.** — The southeastern portion of the state; known only from Appanoose, Davis, Jefferson, Van Buren, and Wayne counties. Found in low meadows and pastures; commonly in crayfish burrows. (See map.)

The key presented herewith is designed to permit ready identification of the metamorphosed frogs and toads found in Iowa. Two alternative sets of characters are given under each numbered item. Beginning with item 1, select the set of characters (a or b) which properly describes the animal in hand, and proceed to the number indicated at the right. This process is continued until the name of the species is reached. It is advisable that **both alternatives** be considered before proceeding to the next number in the key.



Diagrammatic outline illustrating certain external features of frogs and toads used in the key.

## KEY FOR THE IDENTIFICATION OF IOWA FROGS AND TOADS

1 a. Parotoid glands present. Skin with many enlarged warts.

(Continued to Page 30, Column 1)



## Frogs and Toads

(Continued from Page 29)

Hind foot with one or more enlarged and darkened digging tubercles. Toads .....2.

- b. No parotoid glands. Skin smooth or with small warts. Tubercles on foot small and not darkened. Frogs.....5

- 2 a. Blotches on back large, conspicuously light margined, each including seven or more warts. Parotoid glands smaller, their length less than distance between them. Ridges between eyes converging forward to form a prominent boss or knob.

## GREAT PLAINS TOAD

- b. Blotches on back small, without light margins, each involving from one to five warts. Parotoid glands larger, their length usually at least as great as distance between them. Ridges between eyes parallel or moderately converging, but not uniting to form a knob. ....3.

- 3 a. Breast and belly more or less heavily mottled or marbled with dark. Parotoid glands kidney-shaped, their width less than to little more than distance between the glands.

## AMERICAN TOAD

- b. Underparts without dark, or with one or a few dark spots on breast. Parotoid glands longer and narrower, usually about twice as long as wide, and their width usually  $\frac{2}{5}$  to  $\frac{2}{3}$  the distance between glands. ....4.

- 4 a. Southeastern Iowa. Size smaller, body length less than three inches. Dorsal dark spots involving three or four (occasionally two or five, rarely one or more than five) warts.

## FOWLER'S TOAD

- b. Western two tiers of Iowa counties. Size larger, body length often three inches or more. Dorsal dark spots involving one or two (occasionally three, rarely four or five) warts.

## ROCKY MOUNTAIN TOAD

- 5 a. Undersurface coarsely granular. Size small, body length not exceeding two and one-half inches. Tips of fingers and toes more or less expanded or dilated. Tree frogs...6.

- b. Undersurface smooth. Size large, body length usually greater than two and one-half inches. Tips of fingers and toes not dilated. Typical frogs .....9.

- 6 a. Legs longer, when hind leg is bent forward heel extends approximately to end of snout; tibia (heel to knee) much greater than half body length. Hind feet well-webbed, shortest toe entirely included in web. Rear of thigh marked with alternating dark and light lengthwise stripes.

## NORTHERN CRICKET FROG

- b. Legs shorter, when bent forward heel does not extend be-

yond eye; tibia less than half body length. Hind feet less well-webbed, at least one phalanx of shortest toe free from web. Rear of thigh without alternating stripes..7.

- 7 a. Back usually with three clear-cut dark stripes, the middle one extending forward to snout. Toe disks poorly developed. Toes long and slender, scarcely webbed, three and one-half to four phalanges of longest toe free. Form slender.

## STRIPED CHORUS FROG

- b. Back variously marked, but without clear-cut dark stripes. Toe disks well developed, evidently wider than rest of toe. Toes shorter and thicker, well webbed, two or three phalanges of longest toe free. Form robust. ....8.

- 8 a. Size smaller; body length of adults seven-eighths to one and three-eighths inches. Color tan or brown, usually with an oblique cross of darker brown on back; no white spot below eye; no orange on thighs. Fingers free.

## SPRING PEEPER

- b. Size larger; body length of adults one and one-fourth to two and two-fifths inches. Color variable, usually gray or green with an irregular pattern of dark on back; a large white or greenish-white spot below and slightly behind eye; thighs with much bright yellow-orange in life. Fingers about one-third webbed.

## COMMON TREE FROG

- 9 a. No dorso-lateral skin fold on body. Longest toe of hind foot with only one phalanx free from web.

## BULLFROG

- b. Dorso-lateral skin fold present. Longest toe with one and one-half to three phalanges free from web....10.

- 10 a. Dorso-lateral fold extending only about two-thirds to three-fourths distance from eye to groin. Dark spots on back, if present, smaller and not sharply outlined.

## GREEN FROG

- b. Dorso-lateral fold extending to or almost to groin. Dark spots on back (very rarely absent) sharply set off from ground color. ....11.

- 11 a. Light spaces between black spots on back and sides heavily mottled or reticulated with darker. Snout and upper jaw irregularly mottled and spotted, without well defined dark or light stripes. Back and sides roughened with many ridges and tubercles. Tibia less than half body length.

## NORTHERN CRAYFISH FROG

- b. Light spaces between black spots on back and sides rather uniformly colored. A clear-cut light stripe on upper jaw from snout to above foreleg. Back and sides rather smooth, with fewer ridges and tubercles. Tibia more than half body length. ....12.

- 12 a. Dark spots on back more rec-

## FOREST, FIELD and STREAM

Echoes from the Great Outdoors

"Allah does not deduct from the allotted time of man those hours spent in fishing"

By FRANK POWERS

Cedar Rapids Gazette

I became a columnist more by accident than intent, and realize full well that I am still in the kindergarten and an amateur as far as journalistic accomplishments are concerned. I don't think it is too difficult for anyone who loves the out-of-doors and the things that go with it to write an outdoor column. In fact, you just can't help writing and talking about the things you are interested in and the things you love to do. I have come to the conclusion that that is what makes a fisherman strain the truth a wee bit when he tells about the one that got away, and makes the hunter come in with those wild tales of the millions of ducks or pheasants he saw. Sort of an intoxication that follows a day spent out in the open with Mother Nature.

I began this career as an outdoor columnist several years ago as a co-author of Forest, Field and Stream, and after the late Chuck Kosek had laid down his pen and gone to the Happy Hunting Grounds of Gitchie Manitou, the rotund and jovial Tait Cummins, sports editor of the Cedar Rapids Gazette, induced me to take over the column. There you have the story of how and why I am in it, and from here on out I refuse to be held to blame for anything.

My hobbies are hunting and fishing. I never did and never will get enough of either of them. As to hunting I would say that duck hunting comes first with me. Why a man will sit out in a duck blind all day with the temperature down below freezing is more than I have ever been able to figure out. As a good friend of mine once told the parents of

tangular, and usually in regular lengthwise rows. Groin and inner surfaces of hind leg bright yellow in life. Ground color tending to be bronzed or brassy; dark bars on legs narrower and more numerous. Springs and cool streams in eastern Iowa.

## PICKEREL FROG

- b. Dark spots generally more smoothly rounded in shape, and less regularly arranged. Groin and inner surfaces of hind leg white in life. Ground color green or gray-green to bronze; dark bars on legs broader and less numerous. Throughout Iowa.

## LEOPARD FROG



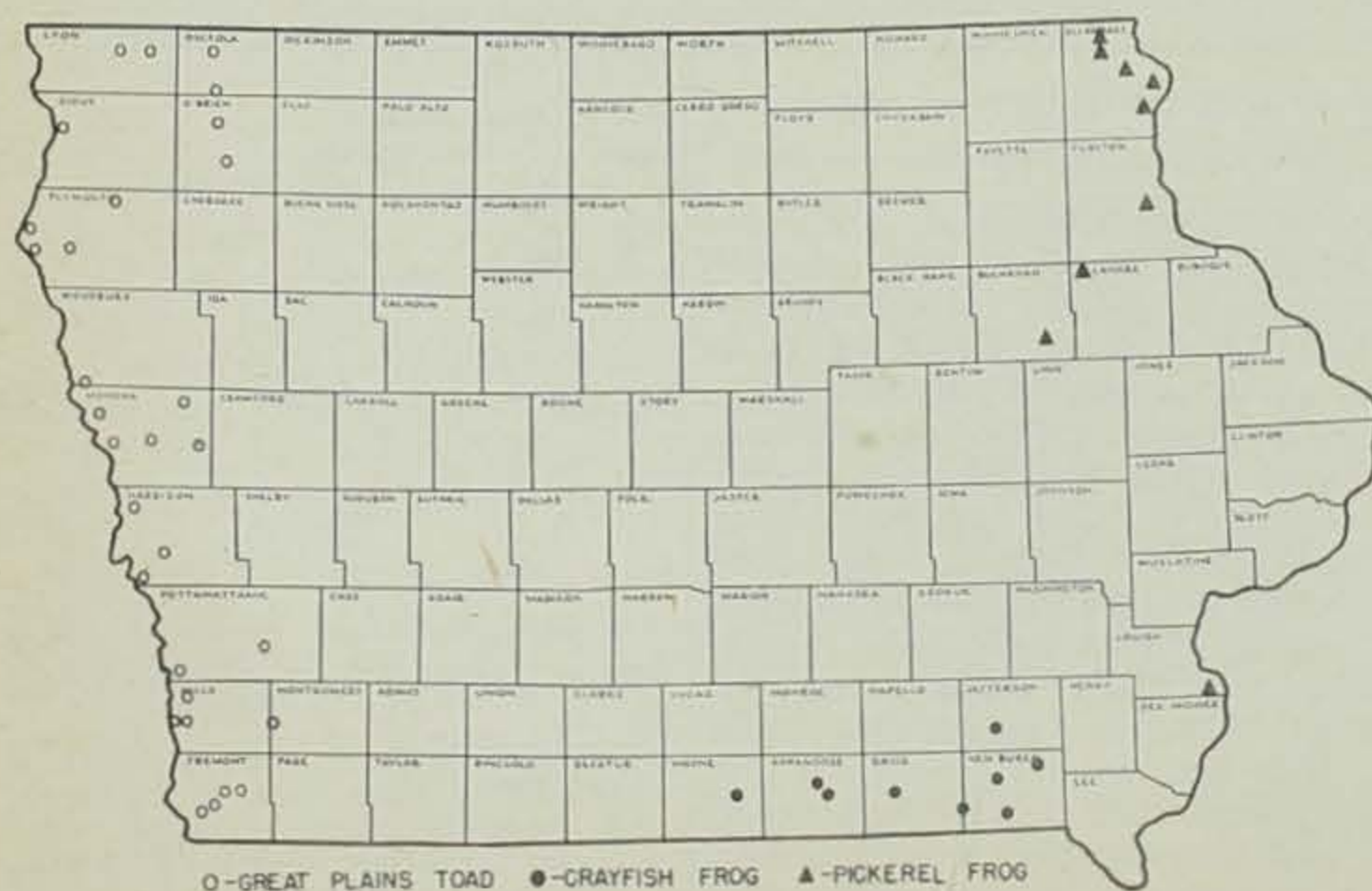
a boy who wanted to become a duck hunter, "I don't know of a worse thing he could take up as a hobby, but I don't know where he could ever meet a finer bunch of men and get so much personal satisfaction." I never pass up a chance to hunt pheasants, squirrels, rabbits, quail or anything that is legal game at the time.

In the past several years I have been introduced to crow shooting as a pastime and conservation "good deed", and must say that as a sport it ranks second to none. I strongly advocate that all hunters get interested in it as a between season way to keep their eyes in focus and keep the feel of the old fowling piece.

My fishing is just as important to me as my hunting, and whenever I am asked which I like the best I have to say, "Hunting in the fall and winter, and fishing in the spring and summer." I'm certainly glad they don't come at the same time. Bad enough to have the fall fishin' and squirrel huntin' overlap as they do. I don't turn my nose up at any kind of fishing unless it's carpin'. That I don't have much time for. Bass and trout are probably my first choices. What can furnish a bigger thrill than a good smallmouth or trout on a fly rod with about a seven and one-half foot leader tapered to about 2x? As the younger generation say, "Out of this world, Mister, out of this world." Along with my fishing I do some artificial fly tying for my personal use only, and that along with the rod repairing and such furnishes something to keep the old temperature down during the winter evenings. In fact the "front office" of one of our largest fishing tackle manufacturers refers to me as "that Cedar Rapids bait bootlegger."

As a kid I spent my boyhood over in Shelby county in western Iowa, and I don't mind telling you it was a real boyhood. We didn't have any fishable waters of any consequence, and our fishing was done in a few small creeks and the old Nishnabotna River. Few bullheads and catfish were all. I never learned about game fish such as bass, trout, pike and the like until about 22 years ago when a good

(Continued to Page 32, Column 3)





# Disaster to Fish and Wildlife Result of Mississippi Drawdown

By EDWIN ROBINSON

Sabula Gazette

Editor's Note: Edwin Robinson, the author of the following article, was raised on the Mississippi River at Sabula. He is a commercial fisherman and trapper and writes a wildlife column regularly for the Sabula Gazette. In this article he paints from his observations a vivid picture of what happens during a midwinter Mississippi River drawdown.)

Water levels in the pools of the upper Mississippi River were held to capacity levels all during the late autumn of 1943 to further the interests of navigation.

This, it was said, was an aid to the war effort. Be that as it may, this writer is in no way prepared to argue the question. But what we do know is that this vast amount of water filled all of the natural depressions to overflowing throughout the entire upper river area. This fullness of the lakes and sloughs so late in autumn furnished schooling grounds for countless millions of fish, seeking deep quiet waters in which to spend the winter.

The conditions were ideal for many species of both game fish and commercial fish. Astronomical millions of all varieties were hatched and reared to fingerling size in these same lakes and sloughs during the spring and summer of the past year. These young fish, along with many of their adult parents, still remain in these waters.

Thousands upon thousands of muskrats prepared winter homes in these lakes and sloughs. They built houses or dug burrows in the shallow banks where the food supply is most abundant. They settled down to spend the long winter.

Hundreds of beavers, like the muskrats, prepared winter lodges in these flooded areas. They cut the tender willow and cottonwood trees that make up the principal source of their winter food supply. In the bottoms of the lakes and sloughs near their

dens and lodges they anchored these many "food logs".

Scattered about the bottoms of these lakes and sloughs, buried in the cold mud with nothing to betray their presence except an occasional "head hole" lay the turtles. The great moss-back or snapper, the red-leg or terrapin, the diamond-back or log turtle, and the leather-back or soft-shelled turtle all settled for a long winter sleep.

In the wet leafy carpet at the bottom of these same waters lay hidden the frog and crawfish, the washbugs and water-treaders, the hellgrammite, the leech, and a hundred and one other forms of aquatic life that go to make up that mighty panorama of life upon and beneath the surface of the waters.

Each of these creatures is in some way dependent upon the other for its existence, each a tiny cog in that mighty and well-balanced wheel called nature.

Each of these creatures is dependent upon an adequate supply of fresh, sweet, water to assure its coming forth in the spring alive, physically fit and capable of reproducing, each after its own kind as is the scheme of things.

Then in the dead of winter when all these creatures were settled, each after its way, and the heavy covering of ice and snow lay cold and still upon the waters, came tragedy.

Again to further the interest of navigation on some remote part of the river hundreds of miles to the south, so we are told, the water supply of the upper river is released from its impounding dams and sent rolling downstream. Rapidly the waters of our lakes and sloughs diminish. The ice along their shore lines drops and breaks up with resounding crashes as the supporting waters beneath are drawn away. Lakes become separated from one another and break bar-

ren areas of jumbled ice and snow lie at crazy angles upon the mud that but a few days before was the bottom of a lake.

Countless schools of fish are crowded into small areas where water still remains. So crowded are they that the oxygen supply is soon exhausted and the lake becomes a slimy pool of foul water filled with the carcasses of dead fish.

Turtles perish beneath frozen mud that was once the bottom of their chosen lake or stream. Countless frogs, crawfish, and other aquatic and semi-aquatic forms of life perish in a few short days.

As the water is drawn away from their houses and dens and the ice caves in upon the runways in the lake's bottom, the muskrats are driven to seek food and shelter without the protective covering of ice overhead. They travel over snow and ice in sub-freezing temperatures, and their tails and feet become frozen. They become easy prey for the elements and the feathered and four-footed predators, such as the great horned owl and mink.

Thousands upon countless thousands of bi-valves, most of which are valuable to man as a source of pearl-shell, are left stranded and perish in a few short hours. Destruction lies at every turn of the stream's shore.

This is the picture of our own Mississippi River. This is the dismal picture every Iowan must visualize when he reads a brief newspaper announcement, "Pools 10 to 26 will be drawn down to channel to provide downstream navigation water."

Thus handiwork of nature, put upon this earth for the benefit of man, is destroyed in a few short hours that this same man can float a boat somewhere down the river.

Acts of this kind are perpetrated against a good and bountiful nature each and every day of the year somewhere in this broad land of ours. Yet many who perpetrate these offenses preach the gospel of conservation. When, I ask you, will conservation in this, the richest and most over-exploited land on earth, cease to be a farce and become a reality. After it is too late? We hope not.

## Hats Off to Mr. Rabbit

What species of game are the most popular? Where is the most sporting ammunition used? These are questions which have always been subjects for argument wherever sportsmen meet.

The Remington Arms Company, in an extensive post-war planning survey, has gathered a great deal of data which is believed to be the nearest approach

to the answer to these questions yet expounded.

The information accumulated reveals that the lowly rabbit, "Molly Cottontail" to most of us, is far and away the most popular species of small game, insofar as the consumption of shotgun shells is concerned. The figures show that, in normal times, 88 per cent of the shotgun shells produced are fired in the field. The remaining 12 per cent is shot at the traps or in the sport of skeet. Of the 88 per cent shot in the field, the rabbit attracts 29.6 per cent of the composite sportsman's fire, more than double that of his nearest competitor, the squirrel. The percentages compiled follow.

Rabbit	29.6%
Squirrel	14
Quail	13.9
Ducks & Geese	10.5
Pheasant	9.5
Doves	7
Other Game	3.5

88.0%

Trap and Skeet 12.0

TOTAL 100.0%

The survey also shows that 60 per cent of rim fire cartridges are used in the field. Match shooting consumes 5.1 per cent, gallery shooting 7.7 per cent, and informal shooting, such as practice and plinking, 27.2 per cent.

The center fire consumption figures present a different picture. Pistol and revolver shooters, surprisingly, surpass the riflemen in the big-bore field. Center fire rifle cartridges are shot as follows:

At big game 32.5 per cent; at predators and small game 5.2 per cent; miscellaneous 1.8 per cent. This makes a total of 39.5 per cent. The larger proportion goes in pistols and revolvers in the following percentages.

Law enforcement 45.5 per cent; competitive target shooting 11.1 per cent; and miscellaneous 3.9 per cent.

Remington, of course, does not maintain that these figures are exact, but they are believed more nearly correct than any heretofore presented.—Remington News Letter.

## They Go Marching By

One by one they go marching by—the hunters of this area called to the colors, each with a backward glance at the sports that they leave behind, but happy that they can fill a place in the nation's activities.—Bellevue Leader.

An ounce of No. 9 chilled shot contains 585 pellets; No. 8 shot 409 pellets; No. 7½, 345; No. 7, 299; No. 6, 223; No. 5, 172; No. 4, 136; No. 2, 88; and No. 1 shot, 73 pellets to the ounce. Shells loaded with soft shot contain slightly less.



As an aid to winter river navigation the nine-foot channel dams in the Mississippi River were opened and lakes behind them drained. This photograph shows a portion of one of the lakes after the drawdown. The car is on the ice over one of the deeper holes in the lake bottom. In such pools aquatic life is trapped and often perishes. The stumps in the background are normally under water.



## Know Your Outboard Motor

**Editor's Note:** Statistics show that more than eight million people in the United States buy fishing licenses every year. There are more millions who fish that don't need them. While not all of these fishermen own and use outboard motors, many of them do and profess almost as much genuine affection for their motors as for their favorite pastime and most satisfying recreation.

It is well for them to know "what makes the wheels go 'round'" in such important and indispensable equipment for only in that way will they get full and complete returns. This series of articles during the next few months will endeavor to help the novice and old-timer alike to understand the fundamentals of outboard motor operation, care, and performance to the end that they may thus get even more enjoyment from them.

Knowing just a little more at just the right time about the operation of an outboard motor may spell the success of a long-planned vacation on the water. It is hoped that those who read these articles WILL know that little extra at a time when knowing will be gratifying.

It was nearly 35 years ago that a young man rowed across a lake on a hot day to buy some ice cream for his girl and while he rowed back the ice cream melted—so the story goes. He designed an outboard motor and the first factory-built outboards were introduced by him about 1909. Just compare an automobile of that vintage with the sleek lined cars of today and get a fair idea of the progress that has also been made in outboard motors in the same time.

Outboard motors continued as heavy, crude, noisy and only semi-reliable until the early 1920's when there came into use that new wonder-metal aluminum. Weights decreased from 75 pounds or thereabouts to as low as 35 pounds for a smooth running twin motor of two horsepower. And that was when the outboard motor industry got its "second wind" and really started to go.

Back around 1922 even the largest motors were rated only about three or four horsepower. It was not until 1926 that larger motors came into the picture, motors that developed six or eight horsepower. But from there on the development progressed rapidly so that by 1929 four cylinder motors up to 30 horsepower and even larger were not uncommon.

Motors of 30 cubic inches piston displacement today develop above 20 horsepower. In those days they were not quite so powerful although ratings had not been standardized. In 1929, it was estimated at the time, the industry as a whole built and sold somewhere around 14,000

outboard motors of 30 cubic inches and larger. In no year since then has the large-motor volume been anywhere near that quantity. During the more severe depression years of 1932-33 it dropped to almost nothing. While small-motor production increased many fold from those years to 1940, large motor production and sale "came back" only part way—to an estimated half of what it was in 1929.

The greatest advancements in motor construction, resulting in a combination of light weight, low cost, dependability, carefree performance and operation features, took place from about 1937 to the present time. Where five horsepower had previously meant a price well above \$100 and weight probably higher than 45 pounds, then, and in later years, it came to a mere "handful" of only 35 pounds or less and a price as low as \$100.

This combination of better construction and performance with lower cost stimulated the use of outboard motors, and the sale of new ones to well over twice what it had been in the former "boom" year of 1929.

That, in brief, is the history of this young, virile, industry. In size, no outboard motor producer can compare with an automobile plant, yet the engineering and production advancements of the industry have more than kept pace with its larger and older "big brother".—Johnson Motors.

(Next Month: "What Is An Outboard Motor?")

### Shooting for Survival

"Food for fighters" is the purpose of a new shot cartridge recently developed by the Technical Division of Remington Arms Company, Inc., Bridgeport, Conn.

When American airmen are forced to land in tropical jungles, they often-times are forced to live off the land until rescue comes or they are able to rejoin Allied troops. Each is now equipped with a .45 caliber automatic pistol, a "jungle kit" containing necessities, and other equipment.

The new shot cartridge is of .45 caliber and contains approximately 120 No. 7½ shot pellets. Pattern tests by Remington ballistic research workers reveal that it will throw an average of 60 per cent of the shot charge into a circle 30 inches in diameter from a distance of 40 feet. It is the first cartridge of its caliber and type to be developed.

The case is of brass, with a thin water-proofed top wad held in place by a slight crimping. In order to accommodate the heavy powder charge necessary to give effective penetration to the load of shot, the cartridge is slightly longer than the regulation .45 caliber combat cartridge. Hence it must be fired one shot at a time, as the cartridge is too long

Frank Powers, author of the "Forest, Field and Stream" column in the Cedar Rapids Gazette.



### Forest, Field and Stream

(Continued from Page 30)

friend taught me the intricacies of bait and fly casting. Any lad lucky enough to live near good bass or trout fishing and who learns about those wily members of the finny tribe during his boyhood will find in later years that his fountain of memories will never run dry.

Most of my fishing and hunting has been done in the state of Iowa, with occasional trips of a few weeks' duration into our neighboring states of Minnesota and Wisconsin. This is mainly due to a chronic condition known as lack of funds. If I had a surplus of the "root of all evil", you

to fit into the magazine of the pistol. This is an advantage to the soldier alone in the jungle, for it permits him to shoot a bird or small animal for food and be instantly ready for bigger game—or the enemy. All he has to do is to snap the magazine loaded with regulation cartridges back into the frame of his automatic pistol and he is again ready for anything that might happen.

The new cartridge also greatly enhances survival chances for flyers adrift at sea, since waterfowl can be shot easily with it. Had this cartridge been in use by the air forces before the experience of Captain Eddie Rickenbacker, the suffering of the famous flyer and his crew would have been greatly diminished.

Two water-proofed boxes, each containing 20 of the newly-developed cartridges, now make up an integral part of the flyer's "jungle kit".—Remington News Letter.

can be assured that I would explore some of those hunting and fishing paradises we all read about. Albeit, I have and still do enjoy fishing in Iowa as well or better than any place I have ever fished. True we don't have the thousands of lakes teeming with fish (at least they are advertised that way), but there is nothing that quite compares with a day or an afternoon on a good bass or trout stream with a fly-rod and a hatful of your favorite artificial flies. Nature all around you, and what if you don't come back with a tub of fish? You feel like a new man, and a few good bass or trout in your creel are the concluding paragraph to a day well spent out where you could judge and measure yourself by the standards set up by Him.

As a native Iowan I am proud of the strides old Iowa has made in conservation measures in the past 25 years. I have seen at first hand some of the improvements that have been made and that are still going on. Mighty proud and thankful that we have seen the handwriting on the wall and have taken the necessary steps to stop the dissipation of our wildlife and natural resources. Each year there are more and more people turning to the outdoor forms of recreation, and the time will come when people will have more time to spend at their favorite sport or pastime. Education in early childhood will teach people how to enjoy their heritage—the great outdoors—and will perpetuate in them the desire to hand it down to future generations in better condition than they themselves received it.