Original: C. Ketcham
cc: M. J. DeBoer
Institute for Fisheries
Research
K. F. Lagler

July 7, 1952

Revision of I.F.R. Report No. 1331

MICHIGAN TURTLES THEIR HABITS, CAPTURE AND USE

by

Karl F. Lagler

School of Natural Resources, University of Michigan

Turtles belong to the group of animals known as the reptiles which also includes the snakes, lizards and alligators. Ten species of turtles have been identified from Michigan of which nine are native and the tenth is thought to have been recently introduced. Some authorities designate certain species, mostly the land-dwelling forms, as tortoises or terrapins but for practical purposes all may be considered as turtles.

The ten species of turtles found in Michigan differ in appearance and behavior. Some are gregarious while others are solitary by nature. They may prefer different places to live and different foods to eat. But they also have many things in common. For example their body temperature rises and falls with that of the air and water. All bury their eggs in nests dug into porous, upland soils and leave the eggs to hatch alone. During the winter all are very inactive; some species stay on the lake or stream bottom, some bury themselves in the bottom mud, while still others hibernate in soil of their liking which may be some distance from water. They go through this inactive period without renewing the air in their lungs which all possess. In the summer they require air to breathe and will drown if kept under water very long. Their fabled slowness of movement is paralleled

by a very slow growth. This, however, would appear to be compensated by a long life, for some turtles are reputed to live much longer than humans.

All turtles have a "back shell" called the carapace and a smaller "belly plate" called the plastron. Thus they are armored like miniature tanks, and this is their principal means of defense, for they are too slow to escape by running away and most species are unable to ward off predators by destructive attack.

Of the recorded species of Michigan turtles, only the snapper, wood, Blandings and painted turtles are found in the Upper Peninsula and in the northern third of the Lower Peninsula. The others occur farther south. The following brief descriptions and statements of range may aid in the identification of Michigan turtles. Occurrence of any other species in the state would be of scientific interest if correctly identified and reported.

SNAPPING TURTLE (Snapper, mossback, mud turtle) -- Chelydra serpentina. This turtle has a pronounced saw-tooth ridge on top of the tail, is aquatic, non-basking and nocturnal in habits; vicious on defense, it may exceed 2 feet in length and a weight of over 30 pounds but average size is 10 to 12 inches and 6 pounds; prefers sluggish streams, ponds and lakes, and is found over the entire state.

SOFT-SHELL TURTLE (Leather-back) -- Amyda spinifera.
Identified by a thin body covered with a rubbery, smooth carapace (top shell), this turtle is the fastest swimmer of all the turtles; is aquatic, likes to bask particularly on sand bars or grassy banks, is nocturnal in habits and vicious on defense; rarely exceeds 18 inches in length but average size is probably about the same as the snapper, prefers rivers and lakes and is found only in the south half of the Lower Peninsula.

BLANDINGS TURTLE -- Emys blandingi.

Marked with a bright yellow throat and light, yellowish irregular flecks on the carapace, this turtle is aquatic, basking, and gentle in habits; it rarely exceeds 12 inches in length and averages 9 inches or less; prefers sluggish streams, lakes and ponds and is found throughout the Lower Peninsula and central part of the Upper Peninsula.

BOX TURTLE -- Terrapene carolina.

Identified by the box-like covering provided by a hinged plastron (belly plate) which encloses all soft body parts, the box turtle is entirely terrestial in habits; it is extremely gentle and makes an excellent pet; rarely exceeds 8 inches in length; prefers lowlands, both wooded and open, and is found only in the Lower Peninsula and more abundantly in the southern half.

PAINTED TURTLE -- Chrysemys picta.

Yellow streaks on the side of the head and usually red areas around the lower edge of the carapace distinguish this turtle; it is found state-wide (C. p. picta in the southern part and C. p. belli in the northern, and intergrading). It rarely exceeds 8 inches in length, is aquatic in habit and is fond of basking. Common to lakes, sluggish streams, and marshes.

SPOTTED TURTLE -- Clemmys guttata.

One or more rounded, orange-yellow spots on each scute (scale) of the carapace help to identify this species. It is rare in Michigan, usually less than six inches in length, and gentle by nature. It prefers small, quiet waters and marshes and is found only in the southern half of the Lower Peninsula.

WOOD TURTLE -- Clemmys insculpta.

This turtle has a raised, ridge-like keel on midline of the carapace;

the plates of the carapace are sculptured, and each scute of the plastron has an individual dark blotch. Usually less than 10 inches in length, this turtle is semi-aquatic and very gentle, living in water and on land; and will be found in ponds and streams, marshes, and fields. Its range in Michigan embraces the Upper Peninsula and north two-thirds of the Lower Peninsula.

MAP TURTLE -- Graptemys geographica.

Distinguished by an irregular network of yellowish lines on the carapace resembling a road map, this turtle is usually less than 11 inches in length. It is aquatic in habit, is fond of basking and mildly pugnacious when cornered. It prefers rivers and lakes and is found in the south half of the Lower Peninsula.

MUSK TURTLE (Stink-pot) -- Sternotherus odoratus.

This little turtle, usually less than 5 inches long, has a domed carapace, and scutes (scales) of plastron distinctly separated by areas of skin in the males. It emits a musky odor which helps to identify it. This turtle is aquatic, non-basking and nocturnal in habits. It behaves pugnaciously when handled. Preferring quiet waters such as lakes, ponds, and sluggish streams, it ranges in the south half of the Lower Peninsula.

SLIDER TURTLE -- Pseudemys scripta.

The elongated body and frequent line-like red spot behind the eye help to identify this rare turtle. Found only in the general vicinity of Whitehall, Muskegon County, Michigan, it is thought to have been introduced. It is aquatic and basking in habit and prefers lakes or quiet streams.

Turtles--Beneficial or Harmful?

Turtles in general are harmless creatures. Easy prey when out of the water, many needlessly provide a living target for club or gun, others are captured or killed on roadways when afield to lay their eggs or in search of food. Their nests, and young on the way to water, provide a feast for the fox, skunk and raccoon. Many do not survive. Baby turtles are caught for sale as pets or souvenirs, and adults of the larger species are taken for food. Muskrats and mink reduce the numbers of those which winter under water when they are sluggish and defenseless.

Turtles are beneficial in that most of them act as scavengers in keeping the waters free of dead fish and animals. Some feed on mosquito pupae, and on insects which prey on fish, or on mollusks which harbor fish parasites during certain stages of their life cycle.

Some people believe turtles are harmful. A few turtles actually do feed on fish or their eggs and young to a limited degree. The snapper's diet consists of aquatic plants and animals, the latter consisting mostly of small fish, crayfish and frogs. The box and wood turtles feed principally upon succulent fruits and plants, including berries and mushrooms, also on insects, snails, worms and other soft-bodied animals. The others feed largely on aquatic plants or animals, mainly algae, crayfish, insects, mollusks, tadpoles, worms and snails. Some of these items are also used as food by fish but this competition probably is of little effect in most waters. It is believed that turtles, in general, contribute more good than harm, although it is recognized that under certain conditions their presence or numbers should be controlled. A start in this direction is the harvesting of mature specimens for table use.

Turtles as Food

Turtles that are taken and sold in commercial quantities are seldom found in the local butcher shops and many people are unaware of their excellence as food. All of the turtles are believed to be edible, except the box and wood turtles in seasons when their flesh may possibly be contaminated from eating poisonous mushrooms.

The soft-shell or leather-back turtle is probably the most prized while the snapper, also highly esteemed, is the most used because of its greater abundance or ease of capture. The map and Blandings turtles, somewhat smaller, also are good for table use but are not marketed. The painted, spotted and slider turtles seldom are used for food because of their small size. The musk turtle may also be similarly rejected because of size and musky odor.

Methods of Capture

While turtles are occasionally caught by hand when encountered away from water, they are also taken by hand or with an iron hook when in hibernation by probing in muskrat and other holes in stream banks under water and in the mud of the bottom. The bulk of those taken for the commercial market during the summer season, however, are caught in traps.

Traps for this purpose generally are barrel-shaped, and made with iron hoops and fish netting, similar to a hoop or funnel net. Manufactured traps of this type can be purchased from a few sources or they can be made at home.

The trap can be of any size but should be not less than 2' x 4' or more than 3' x 6', and should be supported by three hoops spread apart with two 9-gauge wires or pieces of wood to be attached on either side and at both ends when the trap is set for use. The fish netting should be

approximately 3" square mesh of No. 24 twine, strong enough to hold the largest turtles and open enough to allow the escape of small turtles or any fish that might incidentally enter the trap. Hoops should be of 6-gauge steel wire with a welded joint.

The opening to the trap consists of a funnel-shaped throat of netting in one end, extending from the end hoop to a depth of 18 inches with corners tied securely to the center hoop, and providing an inner opening into the trap 4 inches high and 20 inches wide. This opening somewhat conforms to the shape of the turtle. The opposite end of the trap contains a pursing opening through which the captured turtles are removed. When the trap is completed, it should be treated with copper naphthenate or net tar, the same as commercial fishermen use to preserve twine from rotting and the hoops from rusting.

A number of these traps when collapsed can be transported easily in car or boat and quickly opened and set. Traps can be made of poultry netting and wood frames but they are cumbersome and difficult to move.

Before using any turtle trap, be certain to (1) obtain a Michigan fishing license, (2) notify the conservation officer of the county in which the trap is to be used, and (3) mark or identify the trap with owner's name and address. Because of possible objections, permission should first be obtained from frontage owners for setting traps in front of shore property.

Setting and Baiting Traps

The best places to trap edible turtles are the shallow, soft-bottomed, quiet water portions of lakes, ponds and streams adjacent to beds of pond lilies, and where the upper portion of the trap will extend above water. This is important because if the turtles cannot get their noses out of

water to breathe they will soon drown. Traps should be tied to a stake to hold them in place. They should be visited each night and morning to remove the catch, adjust the trap, and check or replace the bait.

The bait can be perforated, closed, tin can containing fresh fish heads, chicken offal or animal remains. A perforated can bf cheap-grade sardines or salmon also is a good bait. The can of bait should be hung from the inside of the top of the trap so as to entice the turtles into the funnel and through the opening. Having the bait in a can which is partially closed protects the bait from being eaten by the turtles, while the odor and juices emanating through the perforations lure them into the trap. Fresh bait, changed often, is more effective.

Turtles may be taken at any time but they can be successfully taken in traps only during the season when they are active. This begins in late April and extends into September or later.

Turtles may be transported safely in a burlap bag which should first be moistened, and then kept moist en route if the distance to be traveled is long.

Transporting and Marketing Turtles

For market shipment they are usually transported by truck in barrels or boxes with numerous holes bored in the sides for ventilation. If not too crowded, they may be kept indefinitely in a tub, box or pen containing a few inches of water. Care should be taken to prevent fouling of pen or water. If kept for extended periods, they should be fed. Live food, while good, is not required, for turtles may be fed on meat and vegetable scraps from the table.

Most turtles are used by the hotel, club and restaurant trade. Chicago offers a good market for live turtles as does Cincinnati, Baltimore and

Philadelphia. Detroit offers a limited market as do the major towns of northern Ohio and Indiana.

Killing and Dressing Turtles

"Practice makes perfect," and the task of dressing a turtle can become much easier than most persons realize. The first step is the removal of the head. Second, nail the tail securely to a tree or post or side of a building and thus suspend the carcass so that it will bleed out and be in a convenient position for dressing. With a sharp knife, cut around the edges of the skin where it joins the shell and pull the skin over the neck, tail and feet which are then disjointed. The lower part of the shell or plastron is then removed by cutting through the ridges which join the upper and lower shells. The ridges of snappers and soft shells are rather soft and cartilaginous and can be easily separated by cutting with a sharp knife. If not, look more closely for the precise lengthwise joint between the two shells. For other turtles, a pair of stout snippers, a small meat cleaver, or a hand axe will readily sever the shells. This done, the plastron or undershell may be removed by inserting a sharp knife and slicing between the flesh and bone. The exposed entrails are then removed and the four quarters of the meat are easily secured by disjointing them from the carapace and from one another. Next, remove the neck and tail. If the turtle is large, also take the tenderloins that lie along the backbone, one on each side behind the short ribs. Fifty per cent of the original weight should be reclaimed in excellent meat. Some people also remove the giblets, particularly the liver, and consider them delicacies. Eggs in female specimens are also edible and should not be wasted. The shells may be scalded, horny plates flipped off, and the bone with the attached meat fragments used for soup stock.

Next remove all fat from the meat as this is reputed to impart a strong or gamy flavor. Meat then may be cooked or, as some prefer, soaked overnight in a salt solution strong enough to float an egg. One tablespoon of vinegar may be added to each quart of the salt solution to blanch the meat, if desired. If soaked in salt water, the meat should be rinsed before cooking and caution used in further salt seasoning.

Turtle meat consists of dark and light meat only, even though it is frequently asserted that there are 6 to 14 different kinds. The quarters and tail are dark meat, and the tenderloins and neck are light. The texture is fine and resembles beef when properly prepared. However, the muscle fibres are long and large pieces should be cut across the grain to insure the highest edible quality.

Cooking Turtles

Whether used immediately or soaked overnight, parboiling of turtle meat is not necessary. Pressure cooking will insure tenderness.

The number and kinds of ways in which turtle meat can be prepared for the table is limited only by gastronomical preference and imagination. Turtle meat may be the base stock for many different soups, and like other meats may be prepared in various other ways. A few favorite recipes follow:

Fried Turtle: Brown in fat, shortening or butter; pour off excess grease and season, adding a few bits of onion and enough water to cover; simmer until the flesh begins to fall from the bones and is tender (test by sampling and do not rely on "cooked" appearance). Serve hot or cold.

Turtle Cutlet: Use boned meat only; pound as for cubed beef steak; dip in egg batter and roll in dry meal; fry in hot fat.

Curry of Turtle: Dice one pound of turtle meat, and brown in butter with diced onions added; add a little water and simmer until meat is tender; add 2 cups diced potatoes and carrots, 1/2 teaspoon of curry powder; season with salt and pepper and cook until vegetables are done; serve by pouring over molds of cooked rice.

INSTITUTE FOR FISHERIES RESEARCH

Karl F. Lagler

Approved by A. S. Hazzard

Typed by M. C. Tait

MICHIGAN TURTLES

Names	Characters	Range	Habitat
SNAPPER *Chelydra serpentina*	Pronounced saw-tooth ridge on top of tail; length exceeding 2½ inches and weight 30 pounds; mostly 10 to 12 inches, 6 pounds.	Statewide	Lakes, ponds, impoundments, sluggish streams
SOFTSHELL *Amyda spinifera*	Flexible, rubbery carapace; rarely over 18 inches.	Southern half of Lower Peninsula	Rivers and lakes
BLANDING'S *Emys blandingi*	Bright yellow throat; light, yellowish, irregular flecks on carapace; rarely exceeding 12 inches.	Throughout Lower Peninsula; central Upper Peninsula	Lakes, ponds, impoundments, and sluggish streams
BOX *Terrapene carolina*	Hinged plastron enclosing all soft body parts; rarely exceeding 8 inches.	Lower Peninsula, especially southern half	Lowlands, both wooded and open
PAINTED *Chrysemys picta*	Yellow streaks on side of head, red areas usually around lower edge of carapace; rarely exceeds 8 inches.	Statewide as 2 subspecies (*C. p. picta*, southern, and *C. p. belli*, northern) and intergrades	Natural and artificial lakes of all sizes, marshes and sluggish streams
SPOTTED *Clemmys guttata*	One or more rounded orange-yellow spot (s) on each scute of carapace; usually less than 6 inches long.	Southern half of Michigan	Quiet, small waters and marshes
WOOD *Clemmys insculpta*	Raised, ridge-like keel on midline of carapace; plates of carapace sculptured; each scute of	Northern two-thirds of Lower Peninsula;	Streams, ponds, marshes, woods and fields

Habits	Food	Edibility	Fishery
Aquatic; non-basking; vicious on defense; nocturnal	Aquatic plants and animals (mostly fish, crayfish, and frogs)	Excellent	Small; mostly underwater funnel traps (permission and but no license required)
Aquatic; basking, particularly on sandbars; vicious on defense; best swimmer of all Michigan turtles; nocturnal	Crayfish, fish, and aquatic insects, etc.	Excellent	Small, underwater funnel traps; spearing at night, with a jacklight (permission required)
Aquatic; basking; gentle and retiring; not vicious	Crayfish, insects, other aquatic animals and plants	Good	Taken incidentally to trapping snappers
Terrestrial; extremely gentle, excellent pet	Succulent fruits, including berries and mushrooms; small land animals such as insects and snails	Seasonally questionable because of possible contamination of flesh by poisonous mushrooms in diet	None
Aquatic; basking	Aquatic plants, mostly algae, and animals, mostly insects and mollusks	Edible but rarely eaten because of small size	Young sometimes collected for souvenir trade; adults taken incidentally to snapper fishery
Mostly aquatic; basking; gentle	Plants, worms, snails, insects, tadpoles, etc.	Presumably edible	Rare in Michigan; should be protected so that it will not become extinct
Semi-aquatic, living in water (mostly streams) and on dry land; hibernating on land or in water; very gentle	On land, succulent plants including berries and mushrooms, insects, etc.;	Edible, except perhaps when gorged on poisonous mushrooms	Not taken or sold commercially in Michigan; needing protection for preservation

[illegible]	[illegible] exceeding 6 inches.	especially southern half	open
PAINTED Chrysemys picta	Yellow streaks on side of head, red areas usually around lower edge of carapace; rarely exceeds 8 inches.	Statewide as 2 subspecies (C. p. picta, southern, and C. p. belli, northern) and intergrades	Natural and artificial lakes of all sizes, marshes and sluggish streams
SPOTTED Clemmys guttata	One or more rounded orange-yellow spot (s) on each scute of carapace; usually less than 6 inches long.	Southern half of Michigan	Quiet, small waters and marshes
WOOD Clemmys insculpta	Raised, ridge-like keel on midline of carapace; plates of carapace sculptured; each scute of plastron having an individual dark blotch; usually less than 10 inches long.	Northern two-thirds of Lower Peninsula; Upper Peninsula	Streams, ponds, marshes, woods and fields
MAP Graptemys geographica	Carapace with an irregular net-work of yellowish lines resembling roads on a road map; usually less than 11 inches in length.	Southern half of Lower Peninsula	Rivers and lakes
MUSK Sternotherus odoratus	Domed carapace; scutes of plastron distinctly separated by areas of skin in males; giving off musky odor; usually less than 5 inches long.	Southern half of Lower Peninsula	Lakes, ponds, quiet backwaters of rivers
SLIDER Pseudemys scripta	Elongated, often line-like red spot behind eye.	Vicinity of Whitehall, Muskegon County, presumably introduced	Lakes and quiet river waters

pet	berries and mushrooms; small land animals such as insects and snails	because of possible contamination of flesh by poisonous mushrooms in diet	
Aquatic; basking	Aquatic plants, mostly algae, and animals, mostly insects and mollusks	Edible but rarely eaten because of small size	Young sometimes collected for souvenir trade; adults taken incidentally to snapper fishery
Mostly aquatic; basking; gentle	Plants, worms, snails, insects, tadpoles, etc.	Presumably edible	Rare in Michigan; should be protected so that it will not become extinct
Semi-aquatic, living in water (mostly streams) and on dry land; hibernating on land or in water; very gentle	On land, succulent plants including berries and mushrooms, insects, etc.; in water, soft bodied animals	Edible, except perhaps when gorged on poisonous mushrooms	Not taken or sold commercially in Michigan; needing protection for preservation
Aquatic; basking; mildly pugnacious	Snails, clams, crayfish, insect larvae, a few fish, etc.	Edible	Taken incidentally to snapper fishery but not marketed
Aquatic, non-basking, nocturnal, pugnacious when handled	Animal remains, insects, worms, and other water animals	Edible, but too small to be of use	Taken incidentally to snapper trapping
Aquatic basking	Water animals	Edible	None