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ALBERT S. HAZZARD, PH.D.
DIRECTOR

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ADDRESS
UNIVERSITY MUSEUMS
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MICHIGAN TURTLES*

Karl F. Lagler

Are certain turtles a menace to Michigan fishing? Do they benefit fishing or have any relation at all to game-fish crops? The Institute for Fisheries Research in cooperation with the American Wildlife Institute and the University of Michigan has been trying to answer these questions.

The answers which have been secured to date are largely from examinations of the food in the stomachs and intestines of more than nine hundred turtles, representing the nine different kinds native to Michigan. Nearly all of the specimens examined are comprised of the musk, snapping, Planding's, map, painted, and soft-shelled turtles which live in lakes, ponds, and streams. The three other turtles occurring in the state were studied less intensively because two of them, the box and the wood turtle, live almost entirely on land, and the third, the spotted turtle, is very uncommon.

Most of the specimens of the six aquatic species of turtles studied for food were collected in conventional, barrel-shaped turtle traps. Such traps are four or five feet long and consist of three wire hoops about thirty inches in diameter covered by twine netting. At the front end of

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the trap there is a funnel shaped entrance. The rear end is closed by a draw string which may be untied to permit removal of the catch. Bait is placed in a punctured tin can suspended in the center of the trap. Freshly killed fish are a very effective lure, but canned fish, fresh chicken entrails and other such things may be used.

Traps are usually set in water no deeper than the diameter of the hoops. Favorable locations seem to be on soft bottoms near beds of water or pond lilies or other water plants. The turtles which were captured during two summers of trapping for this study were preserved in formalin and brought to the laboratory.

In the laboratory, the "pickled" turtles were cut open and the contents of the digestive tracts washed into dishes. The food materials were sorted and identified, a count was made of the individual items consumed, and the volume of each item was measured and recorded. The records of these analyses were then summarized for all specimens of each kind of turtle.

The information which was obtained regarding the food of turtles is quite different from that which many believed would appear. This is particularly true for the snapping turtle. Since the common snapper has almost always been thought to live entirely on fish and waterfowl, particular effort was made to obtain data on this turtle. The food of 281 specimens from seventy-one lakes, eleven non-trout and six trout streams, mostly on the Lower Peninsula, was studied. The stomachs of all these turtles together contained about five quarts of food and the large intestines approximately nine quarts. In the stomachs about one-third of the food was made up of water plants, the second third of game-fish (mostly sub-legal sunfish), and the last third of dead fish and other carrion, insects, crayfish, snails, and clams. In the intestines, where plant materials accumulate for digestion, a little more than nine-tenths of the

food of all the snappers was aquatic plants. The tendency towards vegetarianism exhibited by this turtle is indeed surprising. ~~None~~ of the other aquatic turtles of Michigan were found to prey on fish, with the exception of a few individuals. The musk turtle or stink-pot, commonly mistaken for a small snapper but distinguished by its short, stubby tail (that of the snapper being almost as long as its shell), was found to feed on carrion, crayfish, insects, snails, clams, and the hard-coated seeds of water plants.

Blanding's or the semi-box turtle, which is characterized by its lemon-yellow chin and throat, was discovered to forage chiefly on crayfish and aquatic insect larvae. Small amounts of carrion, leeches, snails, clams, and water weeds are also taken.

The map turtle, which may be recognized by the irregular net-work of orange-yellow lines on its back, had eaten principally crayfish, snails, and clams. It also eats a few small fish and some carrion, insects, and now and then a little vegetation.

The painted turtles may be distinguished by the red color around the edges of their shells. About two-thirds of the food of this species is composed of plants that grow in the water. The remaining third of their food is chiefly insects but includes some fish remains, leeches, earthworms, crayfish, scuds, snails, and clams.

The soft-shelled turtle, well-known by its rubbery back and pointed head, is a very adept swimmer. For this reason it has long been thought to prey extensively on fish. The specimens examined contained crayfish and "wigglers" of the sort used by anglers for winter bluegill fishing.

Our conclusion is that of the nine species of Michigan turtles, only the "snapper" eats appreciable amounts of game-fish, averaging approximately 0.6 game-fish per meal. But we do not know how much of a factor this is in depleting game-fish populations. If this turtle accounts

in part for poor catches by fishermen, then by way of retribution the commercial turtle hunters which are fast depleting Michigan's supply of these slow-growing reptiles are to be thanked. If, on the other hand, the numbers of game-fish eaten will reduce competition among these fish for food and yield fewer though larger fish to the angler, perhaps conservation of this turtle should be encouraged. It is apparent that the abundance of this turtle is not as great as it formerly was. Commercial turtle trappers report that current catches of snappers from Michigan for the food market are consistently poor. The most productive water areas for snappers (in the southern part of the Lower Peninsula) have long since been "creamed." Implications are that we need not be as concerned over the relation of the snapper to the game-fish supply as we should be regarding the restriction of sizes which may be marketed to insure the future of this natural resource.

Regarding the aquatic turtles other than the nsapper, we have learned that their greatest importance to game-fish probably lies in the competition which they offer such fish for food. These turtles and fish eat many of the same organisms such as insects, crayfish, leeches, snails, clams, etc. It is not known if this apparent competition offers justification for widespread turtle control.

The role of turtles as predators of fish eggs and fry, particularly those of sunfish and bass, has not been fully determined. A little information is available which shows that eggs and fry are sometimes eaten, but we have not been able to find out if any great significance should be attached to this scanty data.

In return for the possible deleterious effects which these turtles may exert as competitors or predators of fish, they constitute the D.F.W. in our lakes and streams. Dead and dying fish and some domestic wastes are eaten by them and are thus prevented from littering bathing and resort

beaches. In addition, they are important as food; all are edible, with the possible exception of the musk turtle, and may be prepared according to any of the several recipes commonly used for the snapping and soft-shelled turtles. It seems very unlikely that turtles are a factor of any great determinative importance in the maintenance of a sustained yield of game fish in Michigan waters.

Instructions for trapping turtles and preparing them for the table may be obtained by enclosing an addressed and stamped envelope in a letter to the Institute for Fisheries Research.



Snapping turtle. Found throughout Michigan. Formerly thought to subsist largely on fish. Studies by the Institute for Fisheries Research have shown it to eat some fish but to live mostly on water plants, dead fish, crayfish, insects, etc.



Soft-shelled turtle. Found to feed mostly upon crayfish and aquatic insect larvae ("wigglers"). Along with the snapping turtle, most commonly taken for table use in Michigan. Photo by Jack Van Coevering.

A SIMPLE METHOD OF MAKING AND TENDING TURTLE TRAPS

Turtle traps are made of fish netting, two to three-inch mesh, knot to knot, fifty-four thread, in the form of a hoop net without wings, three hoops to a net or of wire. They may be larger or smaller as to length, size of mesh, or size of twine. The standard net is four feet in length when stretched. The hoops may be from two to three feet in diameter. Those on the sketch are twenty-five inches in diameter, outside measure, made of half-inch round iron. It is preferable to use galvanized iron as the rust of ordinary iron is detrimental to the netting. The "funnel" conforms to the shape of a turtle, and the mouth is eighteen to twenty inches wide. When setting the net it is important to see that the funnel is stretched open its full width.

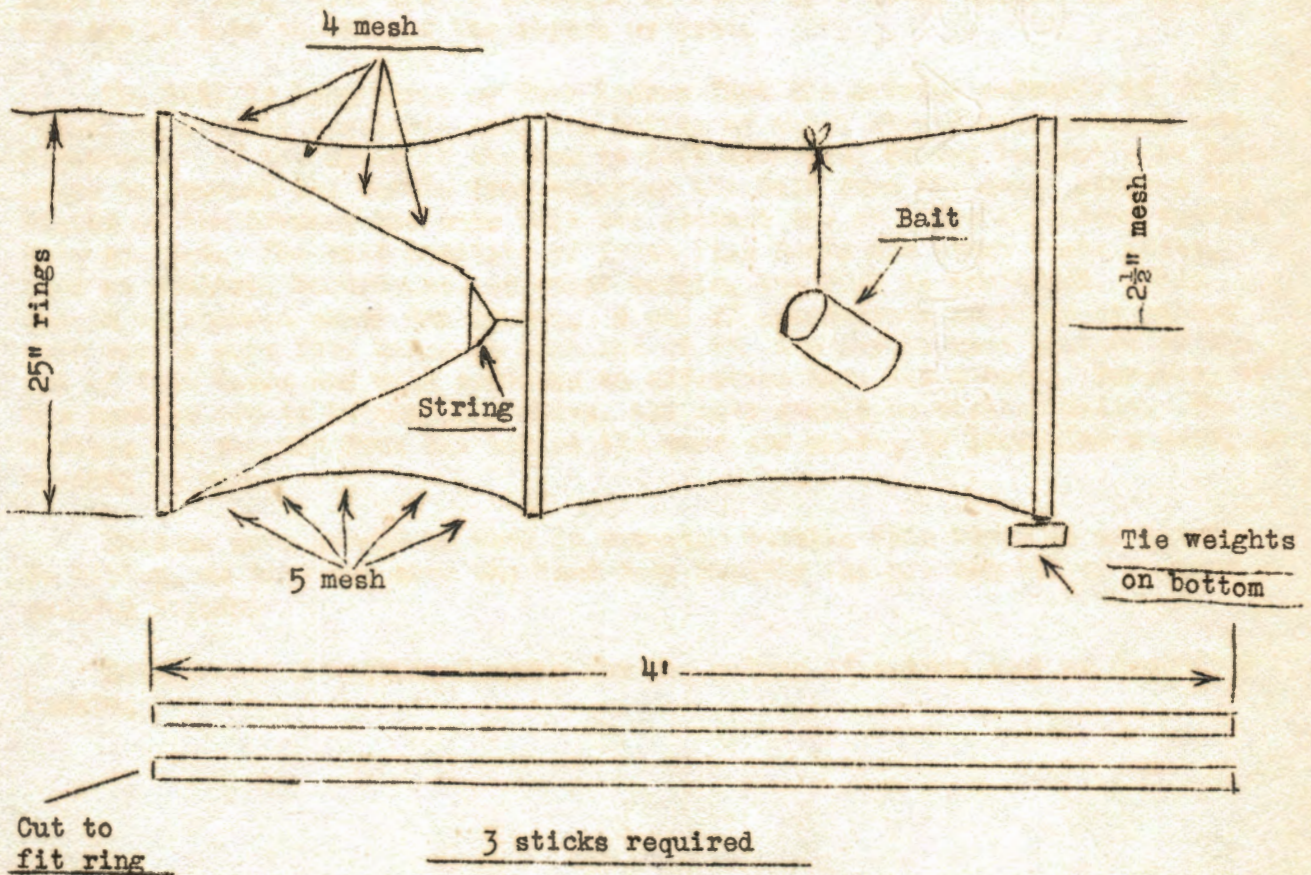
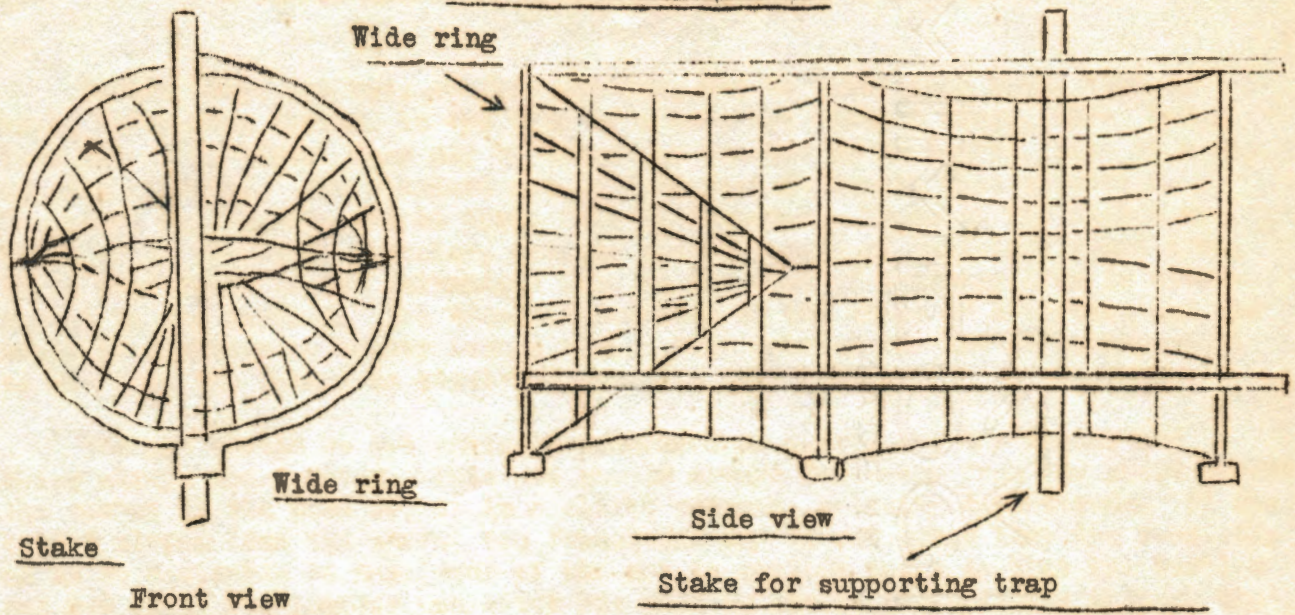
The net should be set entirely submerged or nearly so, the funnel end being always under water. This end should always face away from the shore toward the center of the pond or, if in a slight current, pointing down-stream. If the bottom slopes from the shore, the funnel end may be set lower than the rear end, as it is desirable to have some of the net in shallow water so that the turtles can get air. The snapper can stick his head up six or eight inches through the mesh of the net. Each net is fastened in place by a stake thrust vertically through it into the bed of the stream or pond.

The bait is hung three or four inches from the outside entrance of the funnel in a small vegetable can, the bottom of which should have several perforations. If the cover of the can is left attached, it can be bent back into place to prevent the turtle from removing the bait from the can. Between the visits of the trapper the same bait may attract two or three different turtles into one net. The bait consists of fresh fish heads and other waste parts, beef or poultry, woodchucks, or other vermin, but fish is preferred. This should be changed every day or two. A can of cheap-grade sardines or salmon with one or more fine holes in each end of the can may be used instead of the can of fish heads and will serve as an effective lure for a week. However, if the turtles are to be captured alive, the nets should be visited daily. The turtles are removed from the net at the rear end where, by loosening a cord, an opening is made.

Extreme care should be used in removing turtles from traps so as not to be bitten, as they can move the head very rapidly and are capable of causing a painful injury.

Attached is a working diagram for the making of a trap such as described herein.

TURTLE TRAP



Plans call for 2 3/4" mesh.

Traps to be 17 mesh long and 19 mesh round.

PREPARATION AND RECIPES FOR TURTLES

Preparation

Turn the turtle on its back, exercising care that the turtle has no opportunity to bite the handler. Cut off the head and let the blood drain at least twelve hours. Remove the flat lower shell, cut out the meat, which must be cleaned of the gall and intestines, and lay aside such portions suitable for stews, ragouts, etc. Blanch to remove skin from flippers and other parts. All meat can be used for soups.

SOUPS

In making soups, cook the turtle only until the bones leave the flesh. Many cook too long, which makes the flesh stringy.

1. Turtle Soup - New Jersey Style

Boil meat until well cooked. Take out of broth, chop into small pieces and let cool.

Boil potatoes, onions and macaroni or spaghetti, the latter broken into one-inch pieces, in the broth. Do not add meat until onions, potatoes and spaghetti are well cooked.

Then add meat and chopped hard-boiled egg.

Add about one pint of milk to each quart of soup and one large tablespoonful butter.

As quantity of potatoes, onions, eggs, spaghetti, etc. must be gauged by size of the turtle, no specific quantities can be given, but for an ordinary turtle, weighing about eight pounds, the following proportions will be found proper:

Two medium size onions

Six medium size potatoes (chopped as for clam

Two twenty-minute boiled eggs. chowder)

Some prefer soup slightly thickened, which is done with ordinary flour and water. Salt and pepper to taste. A small quantity of wine, sherry if obtainable, added just before serving, will improve the soup considerably.

2. Soft-Shell Turtle Soup

Use turtle meat same as for beef soup, adding a slice of bacon and onion to modify the flavor.

Soft-shell turtle meat is also good with noodles.

3. Snapper-Turtle Soup

A favorite way to cook snapper turtle is to make the soup like old-fashioned beef soup, with any assortment of vegetables desired, with the turtle meat cut up into small pieces.

4. Turtle Soup

Make up a soup stock, without vegetables, but add egg.

5. Turtle Soup A La Creole - This is the ancient recipe for turtle soup, and it is safe to say than when once eaten after this delightful way no other will seem quite so savory.

Cut the turtle meat into small pieces. Let it brown in a pot with a little lard.

Cut up several onions, a slice of ham, and a little garlic, and stir and mix with the turtle meat.

Then let the mixture brown well.

Put in some flour and mix, pour a quantity of the soup stock into the pot, let it cool, and add a knee joint of veal.

Let it simmer for an hour, then put in some thyme, laurel leaf, parsley, shallots, and when everything is cooked add more parsley and a couple slices of lemon chopped fine.

Just before serving add a wineglassful of Madeira wine, or, in lieu of this, $\frac{2}{3}$ that amount of lemon juice.

6. Turtle Soup - strained

Put the turtle meat into a soup pot, moisten it with broth, let boil, then skim and add sprigs of parsley, celery, sage, marjoram, basil, thyme, bay leaf, mace, cloves, whole peppers and salt. Cook at least four hours as for any other soup stock.

Add the proportions usually employed for soup stock of carrots, turnips, onions, parsley, sweet herbs, cloves, mace and boil gently for five or six hours, keeping the pot closely covered.

When the stock is boiled, it should be strained through a folded towel, laid in a colander placed in a large earthenware bowl, until clear.

7. Turtle Soup - garnished with Quenelles

Three pounds turtle meat, cut small and parboil ten minutes (water to be used as stock). Fry meat in $\frac{1}{4}$ tablespoons fat- ham or bacon drippings best.

2 onions minced

$\frac{1}{4}$ tablespoons flour, browned in fat

Add 1 cup canned tomatoes

1 tablespoon salt

$\frac{1}{4}$ clove garlic, minced fine

4 Qts. stock and water. - Add to above, bring to boil, and add turtle meat.

Add 2 bay leaves, 2 sprigs parsley, 6 cloves, 2 blades mace (or $\frac{1}{2}$ teaspoon mace), $\frac{1}{2}$ lump of sugar, 2 tablespoons lemon juice.

Cook three hours, strain if desired. (continued on next page)

7. Turtle Soup- garnished with Quenelles (Cont'd)

Garnish with sliced hard cooked eggs or quenells of turtle meat and slice of lemon, cut thin and minced. Sherry jelly may be added for flavor.

QUENELLES: Put the turtle meat used in soup through the meat grinder. For 1/2 lb. of meat used, use 1/2 lb. bread crumbs, 2 egg yolks, hard cooked. Season with salt, cayenne, parsley, thyme, cloves and mace. Add 2 whole eggs, 2 tablespoons lemon juice, and milk, water or stock to moisten. Roll and fry like croquettes and add to soup on serving.

FRIED TURTLE

Although the turtles generally preferred for frying are medium-sized soft-shells weighing from 1½ to 3 pounds, many like fried snapper. For frying, the younger and more tender snappers are to be preferred, although the older ones can be used by cooking correspondingly longer.

1. Cut the turtle meat into small pieces, add salt and pepper, roll in flour, and fry in one-half lard and one-half butter until brown, then add a little water, cover up, and steam until done (about 1/2 hour).
2. Fry as above; when browned add some catsup, a few mixed spices, a glass of wine, or, in lieu of this, 2 tablespoonfuls of vinegar and a little water; cover, and steam until done (about 1/2 hour).
3. Some cooks prefer to fry dry, without steam. In this case one must cook slowly, and of course old turtles must be cooked longer than young ones.
4. Simply parboil the turtle meat and fry in butter.
5. Put the turtle meat into salt water for a short time, remove and wipe dry, sprinkle with corn meal, and fry in hot grease, or use butter, salt and pepper and thicken with barley. (In this recipe snapper turtle is generally preferred)
6. Fried Snapper - Put the turtle meat into salt water overnight, take out, wipe dry, sprinkle with flour, and fry in plenty of grease. Fry slowly until brown. This is said to be better than fried chicken. For this old turtles are said to be as good as young.
7. Turtle Outlet - Take lean turtle meat, pound until like hamburger steak, dip into egg, roll in meal, and fry in hot fat. This tastes like veal outlet.
8. Turtle Sausage - Cook 2 pounds of turtle meat until tender, run through a food chopper, add 2 eggs, drop into hot fat or fry right off the spoon until brown.

MISCELLANEOUS

1. Steamed Turtle - Take fresh turtle meat, fill with black pepper and a bit of butter, steam until the flesh separates from the bones, then add black sauce (the soy-bean sauce to be found in Chinese Restaurants) or Worcestershire sauce.

2. Simmered Turtle - Take 1 pound turtle meat, wash, cut into cubes, brown in fat (lard or butter) with 1 large or 2 medium-sized onions, simmer until tender, add Chili pepper while simmering. To serve pour over boiled rice.

3. Curry of Turtle - Take 1 pound of turtle meat, brown as above, with 1 large or 2 medium sized onions. Put into the pot 1 medium sized potato, 1 carrot, the onions which have been cooked with the turtle, a small piece of parsley, 1/2 teaspoonful of pepper, 1 teaspoonful of salt, and 1/2 teaspoonful of curry powder.

Add the browned turtle meat to the mixture in the pot and let simmer until tender. Make molds by hollowing out cups of boiled rice and serve in the molds. This tastes like curry of chicken or curry of veal.

4. Turtle Rivola - (a) One-half pound turtle meat, best chopped through a food chopper, add 2 onions, cook until tender, add 1/4 lb. of cheese and salt and pepper.

(b) Take 1 cup flour, 1 egg, 1/4 teaspoonful salt, make a thick batter, roll out thin into a sheet of noodle dough, and cut into 2-inch dice.

(3) Take 1 spoonful of minced turtle meat, lay on the diced noodle dough, fold over 3 corners and inclose the meat, cook like noodles in the water that the turtle meat was cooked in, to which a spoonful of butter has been added.

5. Stewed Terrapin with Cream - Place in a saucepan 2 tablespoonfuls of butter and 1 of rice flour, stir over a fire until it bubbles, then stir in a pint of thin cream, 1 tablespoonful salt, 1/2 tablespoonful white pepper, 1/4 table- spoonful grated nutmeg, and a very small pinch of cayenne, next put in 1 pint of terrapin meat, and stir it all until scalding hot. Move saucepan to back part of stove, where contents will keep hot, but not boil. Then stir in 4 well- beaten yolks of eggs. Do not boil, but pour immediately into turren containing 1 tablespoonful lemon juice. Serve Hot.

6. Terrapin Soup - Use the meat and eggs from 1 terrapin, put into a stewpan with 2 tablespoonfuls of butter, and let it simmer until quite hot throughout, keeping the pan closely covered. Serve with the following sauce:

1 beaten egg yolk flavored with nutmeg and mace
1/2 cup currant jelly
1 pinch of cayenne
Salt to taste
1 tablespoonful of butter.