Massachusetts Wildlife

MAY-JUNE, 1980

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IN THIS ISSUE

Do you realize that even today there are nuisance flocks of Canada Geese that are being transplanted in New York and Connecticut? (See story on page 2).
(Photo by Jack Swedberg)

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DEALING IN FACTS

In choosing the bobcat to champion their cause in soliciting memberships and funds, the anti-hunting trapping groups very cleverly selected an animal that is both secretive and alluring. Also, there was little groundwork to be laid because of the threatened status of the exotic cats of the world and the international publicity they receive. Unfortunately for them the facts do not bear out their claim that the bobcat is in trouble. *There is no evidence that the bobcat population is endangered nationwide.*

Granted, the bobcat bears watching, especially in view of the demands of foreign markets. But there's nothing new in that. Biologists have been watching the bobcat for years and when it comes to a changing world market on fur they are the first to know.

Concern for the bobcat in Massachusetts began with the Division of Fisheries and Wildlife and its regulatory Board in the late 1940s, long before the cat was adopted as a fund-raising totem by anti groups. It's a matter of record that in the northeast the Fish and Wildlife Board was:

First to remove the bounty on bobcats (1968);
First to make it a game species (1969);
(Thus opening the door to intensive management)
First to establish a season instead of allowing year-round hunting (1971);
First to require mandatory reporting of kills (1971);
First to remove the bobcat season from the open deer season (1971).
First to set an annual harvest quota (1977).

Like most of the wildlife agencies across the country, Massachusetts has trained biologists who are quite capable of managing the bobcat. We have, in fact, two biologists on our staff who made the bobcat the subject of their graduate degree theses, with one of them still continuing his studies of the cat while working with the Division. If you look at the bottom line, though, you'll have to recognize the hunter and trapper as the lab assistants to the biologists. All the regulations in the world would be useless without carcasses to check for age, reproductive status and general condition. It is the man in the field "doing his thing" that is the early warning system. It is the hunter and the trapper that alert our staff to problems that might not reach us until the epidemic stage.

It has been fairly well established that there are about 3000 square miles of bobcat habitat in the Commonwealth. Fortunately it is a habitat that holds little appeal for the developers of cement jungles and shopping centers. It is inhospitable terrain that lies west of Route 31 in our four western counties — THE ONLY COUNTIES IN THE STATE WHERE IT IS LEGAL TO TAKE BOBCAT IN SEASON!

Good management deals in facts — not misrepresentation.

Richard Cronin, Director

by
H W Heusmann

Canada geese in eastern Massachusetts are largely non-migratory.

Flying high in undulating V's, with haunting calls drifting earthward, Canada geese have long been a symbol of the wild. However, many of the geese you see on lakes and reservoirs in Massachusetts are birds of a different feather.

While the Canada goose has been a common migrant through the state there is little evidence that it has ever been a common nester. In 1870, Edward Samuels reported that Canada geese had nested several times on Martha's Vineyard, and provided other unauthenticated reports of birds breeding in southeastern Massachusetts. By 1901 the authors of *The Birds of Massachusetts* reported they had no current nesting records. They also noted that wintering geese were uncommon, but agreed the birds did winter occasionally along the southern coast of Massachusetts. In 1925 the noted ornithologist Edward Howe Forbush recorded no instances of wild Canada goose nests in the state. He believed that the occasional nests of wild geese reported in southeastern Massachusetts were those of escaped domestic birds. In 1905 C.W. Townsend cited the existence of several large flocks of geese kept as decoys in Essex County. In 1920 Townsend reported that some of these semi-wild birds were nesting in Great Neck, Ipswich. Geese that escaped from estates and private aviaries, as well as releases by game bird breeders, probably formed the nucleus of the current Massachusetts breeding population.

A real increase in breeding Canada goose numbers occured when the use of live decoys for hunting was outlawed in 1935. A number of wealthy sportsmen on the north and south shores of Massachusetts owned large flocks of Canada geese specifically for use as decoys and call

birds. Joseph Hagar, former Massachusetts State Ornithologist, reported that many hundreds, perhaps thousands, of geese were maintained on country estates for many years after the use of live decoys was outlawed, in the hope that the regulation would be changed. Finally, many flocks were released, some becoming established on the Ipswich and Concord Rivers, in Marion, Massachusetts, and around man-made lakes and reservoirs — habitats that were largely nonexistent prior to 1900. Geese were successful particularly along the Sudbury Reservoir system, which was built during 1895 to 1898. The main source of birds on this area was an estate in Framingham, adjacent to the reservoir where, in addition to breeding and training steeplechase horses, flocks of free ranging geese were maintained on the grounds for a number of years.

Generally, Massachusetts flocks grew slowly at first, with only a few pairs in each flock successfully rearing young. Ludlow Griscom and Dorothy E. Snyder indicated that by the mid-1950s there were feral birds around Boston, Springfield and on Cape Cod. They reported 30 to 50 pairs in Essex County, with nests and young reported in Wenham, Hamilton and North Beverly. The authors also noted a terminal wintering population on Cape Cod, and Nantucket and Martha's Vineyard islands. By the late 1950s, Division biologists were noting extensive reproduction of Canada geese in Sudbury Reservoir in the towns of Framingham and Southboro, and began receiving complaints about the geese. Based on increasing complaints of fouled lawns, golf courses, swimming holes and beaches, and the involvement of reservoir geese in traffic mishaps, Division biologists implemented a program designed to control the numbers of geese in the Framingham-Southboro area and establish new flocks in rural, goose-less, areas of central and western Massachusetts.

The program consisted of trapping the geese during June and July before the goslings could fly and the adults were undergoing their annual molt — and therefore also flightless. During this period men on shore and in canoes could herd the geese into traps made of old fish nets and corner the birds. (*Massachusetts Wildlife*, January-February, 1973).

Captured geese were aged, sexed and body measurements taken. Most adult birds were banded and released but the goslings were color-marked and taken to new release sites. Between 1967 and 1976, 431 goslings and eight adults were released on 12 sites in central and western Massachusetts. The success in establishing flocks of geese at release sites is distorted due to movements of birds between release sites or, more commonly, to new areas. Marked birds frequently nested successfully for a year or two on an area and then disappeared. Unmarked birds then appeared nesting on nearby ponds. These unmarked birds may have been the young of transplanted geese but we couldn't be positive. We do know, however, that transplanted geese nested at six of the 12 sites as well as five other sites.

The most successful transplant was at a site in Otis, in western Massachusetts. Only one release of 10 birds was made in 1968 but there has been at least one brood annually since 1971. I estimate, based on field observations and information from area residents, that over 100 goslings have been hatched on the pond. Some of the residents that live on the pond feed the geese. While this may have aided in the establishment of the birds and serves to hold them in the area, it is an undesireable practice since it makes the birds tame and tends to concentrate them. Geese have also been established in areas where no artificial feeding occurs. A map based on the Massachusetts Audubon Society's Breeding Bird Atlas is included in — a study conducted in conjunction with the Division of Fisheries and Wildlife. Many of the records for western Massachusetts are the result of our 10-year transplant program.

Not all the geese we transplanted survived to nest. Some were killed by predators, disease, poachers or were victims of assorted accidents. Hunting, as expected, also took its toll. Band recovery reports indicate that 11% of the birds were shot during their first hunting season, while the total hunting recovery rate was 22%. Since reporting banded birds shot is voluntary, the actual number of geese harvested was higher than the percentages indicated.

Geese in eastern Massachusetts are largely non-migratory. They breed on lakes, ponds and reservoirs and then move to major rivers like the Concord, Sudbury or Blackstone to spend the winter. Some birds that nest near the coast move to salt water for the winter where they mix with wild migrants arriving from Newfoundland or the Labrador coast.

An example of the local movements of eastern geese is demonstrated by an adult male goose banded in Framingham on July 7, 1972. The bird was recaptured June 27, 1973 during drive-trapping operations in the same area. The following March the bird was observed in a swamp in Natick where it was over-wintering with a banded female. By May the pair had moved to Morse Pond in Wellesley — apparently a popular spot for geese since birds from several areas had been observed there. The bird was ultimately taken by a hunter on the Blackstone River in Uxbridge in late December of 1976.

We discovered, however, that when we transplanted geese they behaved more like wild birds and tended to migrate south for the winter. We have direct recoveries from Rhode Island, Connecticut, New York's Long Island, New Jersey, Delaware, Maryland and Virginia. I surmise that the transplanted birds mixed with flocks of wild birds that migrated through western Massachusetts and went south with them. Other transplanted geese appeared to move eastward. Those transplanted west of the Connecticut River seemed to move east until they reached the river then followed it south through Connecticut to Long Island Sound. While some geese transplanted to central Massachusetts also went south, others moved back to eastern Massachusetts. A few wound up back on their natal areas. Just because a goose went east, however, did not mean it stayed there. A female gosling transplanted to Chester in 1973 was seen that fall back east in Sherborn, but in October of 1976, she was shot in Worthington, a town just north of Chester.

Photo by Bill Byrne

This goose settled for a nest on top of a muskrat lodge.

Since Canada geese are apparently not native to Massachusetts we were interested in what race or races of geese comprised our resident flocks. Hagar stated that most of the decoy birds came originally from Michigan but that a number were also shipped north from the vicinity of Lake Mattamuskeet, North Carolina. We postulated that the Michigan birds were probably of the Interior race, while the geese from North Carolina were Atlantic Canadas. However, a number of the birds were unusually large and had markings similar to those described for the Giant Canada geese (See *Massachusetts Wildlife,* May-June, 1972). We examined 181 adult

geese and took weight, bill and feet measurements. The ganders ranged between 8¼ and 12 pounds while females weighed between 7 and 10 pounds with an average of 8½ pounds. These weights are slightly lighter than those given for the giant Canada geese in Harold Hanson's book, *The Giant Canada Goose*. Our data on foot and bill measurements indicated that 81% of our males and 86 to 88% of our females equalled or exceded the range of measurements given for the giant Canadas.

We concluded that the geese we measured were of mixed ancestry of the three races mentioned, with the Giant Canada predominant. The large size of the geese may have also been affected by artificial selection during the years their ancestors were in captivity and is of survival value to the non-migratory resident flocks.

The Canada goose has been one of wildlife's success stories. Goose populations have more than doubled in the past twenty years. Close to a million birds winter in the Atlantic Flyway alone. Here in Massachusetts our wintering populations have increased from three to four thousand geese in the late '40s, when surveys were first begun, to between 10 to 16 thousand in recent years. Probably between one and two thousand additional geese winter on inland areas. The sportsman has benefited from this increase. Whereas, Massachusetts waterfowlers were harvesting 1600 geese a year in the early '60s they now average about 7200 annually!

The increase in goose populations, however, has not been an even one. Formerly geese wintered primarily from North Carolina south. But with changing agricultural practices in the mid-Atlantic states geese are now stopping their winter migration in the corn fields of Maryland, Delaware and New Jersey. Virtually no geese winter south of North Carolina anymore. Attempts to move migratory geese from northern states to southern refuges have largely failed. The transplanted geese migrate north in the spring and never return. Some states are now experimenting with establishing non-migratory flocks of their own by transplanting birds from nuisance flocks in New York and Connecticut.

Photo by Bill Byrne

"A mixed blessing."

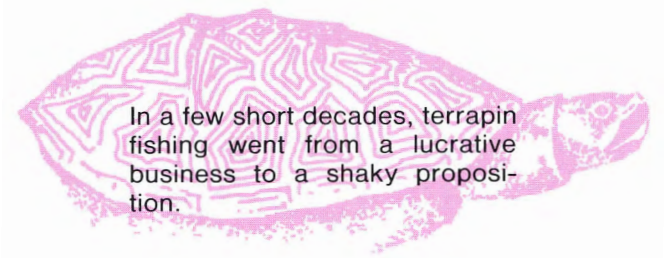
The increase in geese here in Massachusetts is also a mixed blessing. While our transplant program eliminated most complaints about nuisance geese in Framingham and Southboro, flocks in other areas are causing problems. New complaints are coming from the north shore and Cape Cod. Drive-trapping geese is a labor-intensive program and can be successfully done during only short periods of time. While goslings can be effectively transplanted, adults will return to their capture site and it takes years of gosling removal before a reduction in flock size occurs as the breeding geese die off. The problem of non-migratory geese in the northeast is being studied now by biologists who are considering extended hunting seasons, sterilization programs and harassment techniques.

The Division of Fisheries and Wildlife will continue to work with the United States Fish and Wildlife Service in order to manage this very important, versatile and interesting game bird and ensure that the Canada goose continues as the symbol of the wild.

THE ELUSIVE DIAMONDBACK

by
Cathy W. Harris

Cathy W. Harris is a biologist who recently joined the Colorado River Laboratory in Ehrenberg, Alabama.



In a few short decades, terrapin fishing went from a lucrative business to a shaky proposition.

Your boots are sinking into six inches of salty muck as you stare, fascinated, down through the marsh grasses, at the Diamond-back shell. The little terrapin freezes defensively, a snail stuffed into her mouth, and waits for the slightest odd noise. Then, quick as she can slip into the rustling marsh grass, she is gone. She's a part of the marsh now.

Ten months out of every year, you would have to look awfully hard to find a Diamondback terrapin. And should you enter the place that it calls home, you'd better be prepared for sodden boots, sunburn and insect bites. The Diamondback, a shy inhabitant of the coastal marshes from New England to Mexico, ventures out of its salty habitat only during the summer. At this time, the females dig nests and lay eggs in coastal sands. Male terrapins rarely leave the marshes, and mating takes place in estuarial waters. Both sexes feed in these brackish waters on snails and other mollusks and crustaceans. Throughout the winter, however, they bury themselves and survive on stored food supplies for eight long months.

If you do manage to corner a Diamondback, you will probably first notice the beautiful pattern on the upper shell. This pattern is a lovely arrangement of diamond-like shapes, on a shell of muted green with darker shadings. If the turtle you are admiring is a big six inches in length with a slim little tail and a rounded rear carapace, it is a female — and probably at least eight years old. Since the males rarely show themselves, it's a pretty sure bet that a terrapin on sand is a female. The male is usually no more than 4" — 4.5" in length and has a broader, bigger tail with a small head and wedge-shaped carapace.

Now if you turn your captive over — at which point it will rudely tuck in its legs, head and tail — you can get a good look at its pale yellow underparts. Even these are hard and protective, and only a very clever or well-equipped predator would be able to crack this animal for a savory meal. Such predators do exist in the salt marsh — for example, the marsh hawk. But the terrapin's natural enemies generally go for the easier-to-manage youngsters and the terrapin's eggs. Either the manipulative raccoon or the sharp-scented fox can easily sniff down a nest on a summer night and gorge himself on ten or twelve eggs. Sea gulls and fish crows enjoy fresh terrapin eggs, but they can only eat what they see being laid; unlike mammals they can't find nests by using their noses.

All of these predators have coexisted with the Diamondback for centuries and

have never seriously threatened the terrapin's numbers. This is an uncomfortable contrast to the casual way in which humans decimated the terrapin populations of the early twentieth century. In a few short decades, terrapin fishing went from a lucrative business to a shaky proposition; a vulnerable nesting female, or a swimming terrapin confronted with a net is not capable of eluding the predator.

The terrapin youngster hatches anywhere from two to over three months after laying and emerges from one to 10 days after it hatches out. No sooner is it out in the fresh air than it hits the road for the closest vegetation where it will stay until nightfall silently making its way to the marsh waters.

If it does get this far, it has come a mighty long way. As many as two thirds of terrapin nests are destroyed by natural predators; of those that remain, another 25% are wiped out after the young have hatched. Given this stressful situation, it is not surprising that a female terrapin will desert a half-dug nest — or even one with as many as three laid eggs — if a predator appears. It just makes economic sense to start over again somewhere else and keep as many potential young as possible from going straight from her ovipositor into the jaws of death. Multiple nesting may occur, but, even so, terrapins don't rely on massive numbers of eggs to maintain their populations. Persistent destruction of nests or of nesting females spells real danger for terrapin population stability.

The history of human exploitation over the last century reflects a changing America. It all began back in the Gay Nineties when terrapin — prepared in expensive liquors — suddenly became a status food. It was surrounded by an aura of elegance, and terrapin meat was a must for high society dining during the Roaring Twenties. Fortunately it declined as quickly as it had risen. An irrational, passing fad.

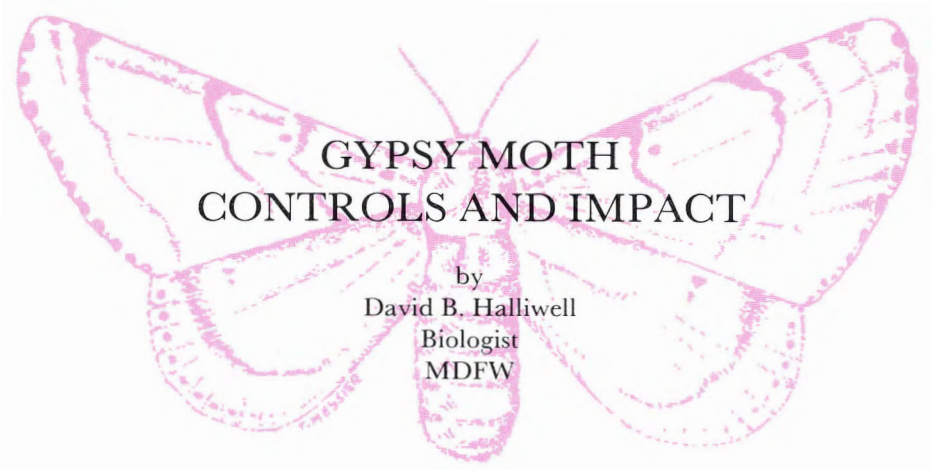
But the fad didn't pass soon enough for the terrapin. At the turn of the century, the actual yield far exceeded the annual production rate and the terrapins their populations. They became so scarce by the early 1900s that fishing for them was almost unprofitable. Whereas in 1886, 2500 turtles had been caught by a single trapper using eight nets, this same trapper caught only 60 turtles in 1895 with the help of six nets.

At this point the federal government entered the picture; until there was a real danger of the terrapin market tumbling, it had remained quiet and counted its revenues. Now it stepped in to research the possibility of setting up terrapin farms. By 1909, the technique was available to private industry and has been used ever since by a handful of large "cultivators." Although prices have been erratic, they were probably most outrageous in the 1920s, when five-inchers went for $20.00 per dozen and six-inchers drew $40.00 per dozen. Right now, the United States consumes about 600,000 pounds a year of terrapin meat, soup and stew, worth about $250,000. Seventy years after farming was initiated, the Diamondback is still recovering. And there are new pressures pushing on the gentle terrapin.

Lately, terrapin oil and leather have increased in popularity, and turtle and egg poaching remains a serious problem. Looking further into the future, land development is the biggest problem. Without a marsh, salt water and sand the terrapin is a dead turtle — unable to reproduce.

Swamp drainage for construction has already taken some prime terrapin territory. The question hangs in the air: who needs this land and who deserves it most? Will it be one more lucrative deal for a human being or a successful terrapin breeding habitat? The answer is not clear.

We know so little about these creatures, how they behave in their natural habitat, and their interrelations with other species. Although they have been renowned for their meat for over 100 years, few have bothered to look into their intriguing private lives.



GYPSY MOTH CONTROLS AND IMPACT

by
David B. Halliwell
Biologist
MDFW

During 1979, approximately 226,260 acres of land/forest was estimated to have been defoliated to varying degrees by the Gypsy moth *(Porthetria dispar* L.) in Massachusetts. Such extensive defoliation was last observed in 1953, when 917,996 acres were defoliated by the gypsy moth. Certainly only a small portion of this acreage was completely stripped of foliage; however, it reflects the presence of a widespread infestation. On the basis of 1979 egg-mass counts the season of 1980 is expected to be a banner year for continued defoliation by the gypsy moth in Massachusetts.

Before discussing "control" measures to combat the gypsy moth population we should also recognize that, to date, little to no actual *controlling* influence has been achieved. However, populations may be *suppressed* on an annual basis in an attempt to protect foliage on susceptible plant species.

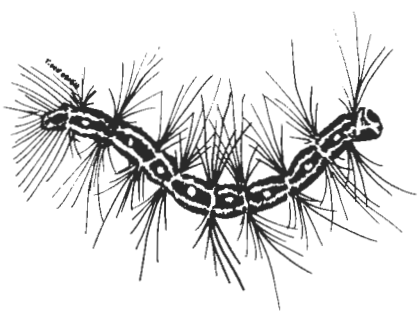
Also, gypsy moth larvae are somewhat selective in their choice of tree species, preferring the oak group (especially white oak) aspen and apple over other species. These food types are most vulnerable when found in pure stands. Less preferred species may be defoliated when found interspersed with the select oak groups.

Relative to our wildlife resources, the impacts of gypsy moth defoliation vary and in some cases are beneficial. Initially, with the loss of canopy, shading is reduced and if defoliation is widespread and complete, drying out of the forest floor may increase susceptibility to forest fire. Moderate defoliation, on the other hand, may benefit wildlife by stimulating understory growth of shrub/berry types. The frass (droppings) deposited by feeding larvae have a fertilizing effect and themselves serve as a food source for some insectivorous birds and small mammals. In time, cavity-nesting species of wildlife might also benefit by use of trees which succumb following successive years of high-level defoliation.

It would seem that coldwater stream fisheries might be negatively impacted by elevated water temperatures due to removal of shading cover by defoliation. However, in most cases, the composition of streamside vegetation is not compatible with high preference gypsy moth food types except in upland oak stands — (high gradient streams) and, depending on the degree of defoliation, refoliation would restore at least partial cover.

Greatest negative impacts of defoliation relative to our fish and wildlife resources would be manifested in those high-use areas frequented by man — primarily as a nuisance factor in recreational areas and backyards by virtue of shade removal, frass deposition and larval presence.

Gypsy moth *suppression* methods include: (1) chemical spray; (2) biological application; and (3) mechanical removal. The latter two methods have no demonstrated adverse effects on wildlife and/or the natural environment. In Massachusetts, the Division of Forest and Parks has recommended the use of the biological agent, *Bacillus thuringiensis* (commonly known as BT) to treat "high value and environmentally sensitive areas." In general, biological insecticides are the most environmentally safe materials currently available for gypsy moth suppression, having no effect on beneficial life forms and being highly selective against gypsy moth larvae. Implementation of the biological insecticide alternative will provide foliage protection but will not provide rapid larval mortality. The larval nuisance will persist for several weeks after application while the biological insecticides take effect. Both BT and Gypchek (nuclear polyhedrosis viral agent) generally require two separate applications in order to be effective, with total costs including insecticide formulation ingredients, mixing and application contracts, reaching $30.00 per acre. In contrast, chemical spray suppression, which requires a single application, costs about ⅓ of this amount per acre. However, in contrast to biological and mechanical methods of suppression, the use of chemical sprays has been shown to significantly impact the natural environment, especially non-target insect populations, including parasites and predators of the gypsy moth, aquatic macroinvertebrates and bees.



Gypsy moth larvae

Currently, the following chemicals are registered by U.S. EPA for use against gypsy moth: carbaryl (Sevin), acephate (Orthene), trichlorfon (Dylox), and diflubenzuron (Dimilin). The latter (Dimilin) is currently under study and only registered for use in hardwood forests and cannot be applied around inhabited areas.

The Massachusetts Division of Fisheries & Wildlife — in recognition of the facts that (1) gypsy moth populations cannot be controlled on a long-term basis; (2) chemical sprays are ecologically undesirable for widespread suppression efforts; and (3) the undesirable impacts of gypsy moth defoliation are limited to man-forest contact areas and high-value commercial forests comprised of susceptible tree species — supports the position already adopted by both the U.S. Forest Service and the Mass. DEM Div. Forest & Parks — to support an *integrated pest management* (IPM) program. Such a program emphasizes on the use of non-chemical methods (e.g., release of parasites and predators, pheromones, sterile male release, disease organisms — BT and Gypchek) including silvicultural forest management and public education. We do not support widespread aerial spraying of chemical insecticides. Chemical suppression, if deemed necessary and environmentally cost-effective, should be restricted to high-use, high-value areas only.

The major objective in using suppression measures against the gypsy moth should be to alleviate the *nuisance* problem where man-forest contact areas (primarily roadsides, residential and recreational areas) are prevalent; and/or in the case of commercially valuable as well as susceptible tree stands to protect against losses in radial growth.

In reality, when vulnerable species composition of forests, man-forest contact areas, commercially valuable forests — and high density populations of gypsy moth — are all taken into account, the actual area susceptible to the undesirable effects of gypsy moth defoliation decreases.

Mariers Sports
624 Park St.
Palmer, 01069

Matts Sport Shop
57 Franklin St.
Westfield, 01085

Orange Auto Body
164 E. Main St.
Orange, 01364

Pioneer Sporting
104 Damon Road
Northampton, 01060

F. J. Rogers Co.
3 Main Street
Florence, 01060

Stans Sport Shop
181 Sunderland Rd.
Amherst, 01002

Town Line Bait &
Tackle 456 River Dr.
Hadley, 01035

WESTERN DISTRICT

Farmington River Shop
Rt. 8, Otis, 01253

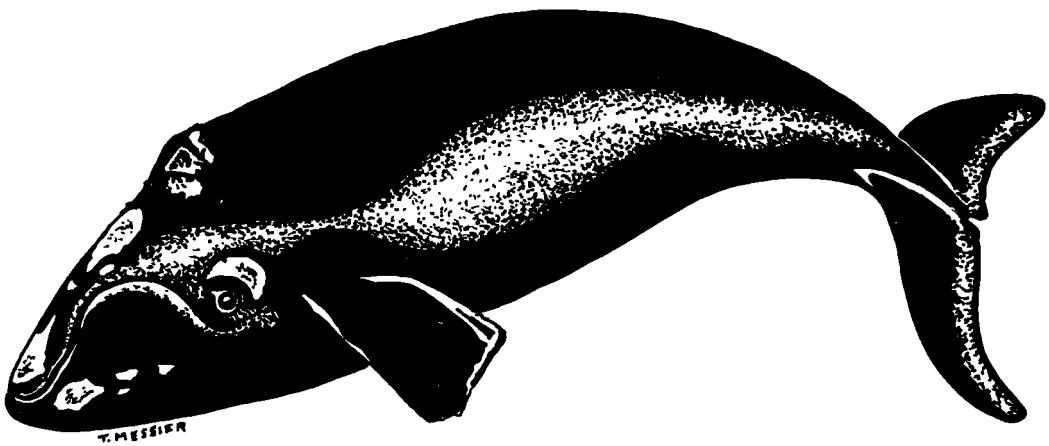
Griffins Gun Shop
Box 733, Marble St.
Lee, 01238

Kateley's Four Seasons
125 American Legion Dr.
(Oasis Plaza)
North Adams, 01247

Morgans Archery &
Gun Shop
740 Church St.
North Adams, 01247

Pete's Gun Shop
31 Columbia St.
Adams, 01220

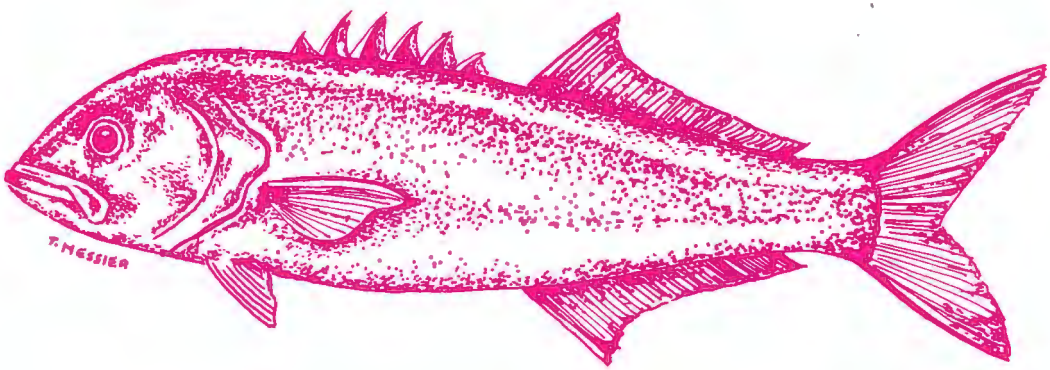
THE "RIGHT" ONE



On April 1, 1980, an ACT designating the whale as the marine mammal or marine mammal emblem of the Commonwealth was enacted. Under Chapter 54, Chapter 2 was amended to read: "The right whale *(Eubalaena glacialis)* shall be the marine mammal or marine mammal emblem of the Commonwealth."

The right whales, so named because they were the *right* whales to hunt before their protection in 1937, are members of the baleen whales (filter-feeders) which include the bowhead and pygmy right whales, neither of which is found in New England waters. They grow to a length of 35 to 50 feet and are slow, sluggish swimmers. They range from Florida to the Gulf of Saint Lawrence in the temperate waters of the North Atlantic Ocean. Once extremely rare, they are believed to be making a comeback, due in large part to the protective measures taken in 1937.

FISHING THE BLUES



by
Robert P. Lawton
Senior Marine Fisheries Biologist
(MDMF)

No other fish has the reputation of bluefish for the voracity and excesses displayed in its feeding habits.

Staff photos

I'm hooked on bluefish. My preoccupation with *Pomatomus saltatrix* began during long-ago summer sojourns on the waters of Buzzards Bay, Massachusetts. As a young neophyte sportsman, I often accompanied my father and his angling chum on sportfishing expeditions. Dad instilled in me early a fervor for fishing. Our quarry included a diverse array of species, but our bluefishing trips were most memorable to me. Traditionally, we trolled for bluefish with conventional gear, employing braided nylon line and Japanese feather jig. Although I never boated many blues, which probably reflected a lack of expertise rather than a paucity of fish, I was impressed by their streamlined appearance, prominent canine teeth, ferocity and gameness. They provided me, then and now, with the ultimate in piscatorial satisfaction.

Years later, as a graduate student specializing in marine biological studies, I researched age, growth and stock identification of bluefish frequenting waters south of Cape Cod. This was a natural outgrowth of both my professional career as a marine fisheries biologist for the Massachusetts Division of Marine Fisheries, and a total commitment to bluefishing. Over the years I have studied the bluefish through the eyes of an angler-naturalist and scientist.

THE FISH

The bluefish as a species pre-dates man in the millenia of evolutionary development of life on this planet. Some biologists believe this fish to be distantly related to the pompano, weakfish and

sea bass families based upon structure and arrangements of its fins, general body form, and skeletal characters, respectively. Likened to an animated chopping machine, the bluefish is a predator supreme within its own element — the oceans of the world. A streamlined, yet relatively stout body, deeply forked tail, formidable dentition and visual acuity endow the bluefish with strength, speed, maneuverability and efficiency for prey capture.

Characterized as a pelagic, oceanic species, bluefish have cosmopolitan distribution, with the exception of the north and central Pacific Ocean. Along the Atlantic coast of North America, they have been common from Cape Cod south to Florida but also may range into the Gulf of Maine, as far north as Nova Scotia on occasions. It should be noted that in the northern part of its range, bluefish typically exhibit large fluctuations in annual abundance during their stay inshore. Only in good bluefish years (i.e., reflecting strong year-classes) do large numbers of medium and larger fish (weighing in excess of four to five pounds) round Cape Cod to the north.

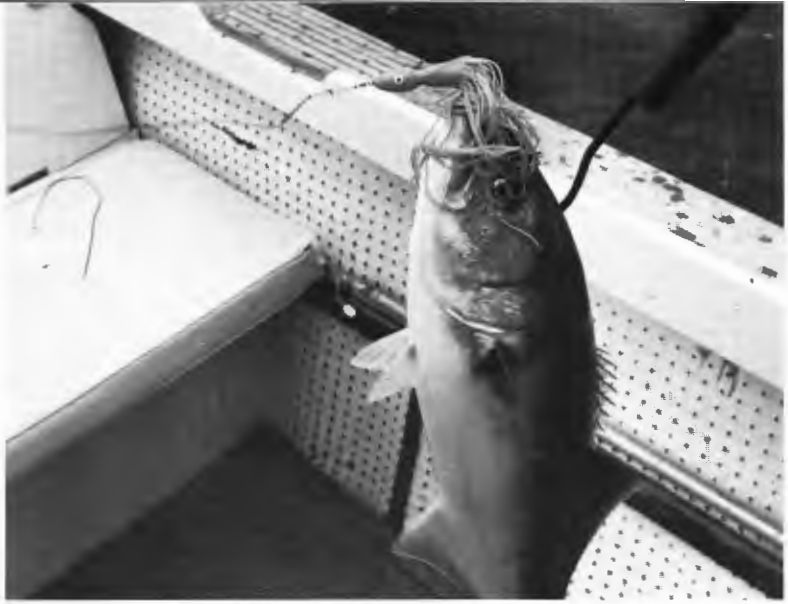
Being warm-water fish, their annual migrations are apparently tied to seasonal warming and cooling of coastal waters along with changes in day length. Inclined to associate with individuals of similar size to form schools, these cohorts, in turn, consort with larger aggregations which undertake a northern and/or inshore movement in the spring and summer and a southward and/or offshore movement in fall and winter. New England sportfishermen generally begin catching them in mid-to-late May in water temperatures of 54° to 59°F. Fishing is in full swing by June on the south side of Cape Cod.

While inshore, local movements and resultant distribution in a particular locale can be influenced by a number of factors, acting singly or in concert: size of the fish, availability of prey, habitat and hydrographical-meteorological conditions (e.g., water temperature regime, wind & weather patterns). Young-of-the-year fish called "snappers" reside in near-shore areas utilizing estuaries, bays and harbors as nursery grounds. Larger fish range further offshore into deeper water, travel farthest north exhibiting strongest wanderlust, and frequent lotic habitats such as tidal and current rips.

Along the United States coast, two extensive spawning areas have been defined which provide the basis for population delimitation. One tract encompasses the offshore waters near the inner edge of the Gulf Stream from southern Florida north to North Carolina, where spawning occurs in mid-spring. A second area characterized by summer spawning, is located on the continental shelf from Cape Hatteras to Cape Cod. Spawning in Massachusetts has been reported seaward of Nomansland, a small island not far from Martha's Vineyard. However, available evidence indicates that most of the spawn (i.e., eggs and larvae) are found 30 to 100 miles offshore.

At 68°F. artificially spawned bluefish eggs hatched in 46 to 48 hours following fertilization. The newly hatched young (prolarvae) averaged 1/10 inch in length. Growth is rapid the first three years of life but thereafter attenuates. Snappers in Massachusetts' waters may reach eight inches by fall. Data I obtained from Buzzards Bay provided the following information: one-year-old fish averaged 14 inches in fork length (measured from the tip of snout to fork of tail), two-year-olds 18 inches and three-year-olds 21 inches. Other studies revealed that an eight-pound fish is approximately 28 inches long and 10 to 12-pound fish are about 30 inches long. At 14 years of age, bluefish may reach upwards of 35 inches in length and weigh in excess of 17 pounds. A fish of 40 inches (fork length) is probably at or near maximum size. The heaviest American fish, officially recognized as the world rod-and-reel record, weighed 31 pounds 12-ounces and was caught off Cape Hatteras, North Carolina in 1972. A 45-pounder, reportedly caught off the African coast, is the unofficial record.

No other fish has the reputation of bluefish for the voracity and excess dis-



This "blue" fell for a fluorescent "hootch" (an imitation squid).

played in its feeding habits. Documented instances of large schools of feeding bluefish leaving a trail of mutilated fish fragments, scales and blood for miles in the sea have been reported. They have been estimated to consume twice their weight in food daily.

Their feeding encompasses a wide variety of prey; and although considered to be opportunistic feeders, blues will at times demonstrate a high degree of selectivity. In various parts of their range, different food species are preferred, which may be a response to availability of prey. Young bluefish (six to eight inches) feed on small crustaceans and small fish (sperling). Older fish prey on many commercial species including; menhaden (pogies), mackerel, sea herring and squid. From personal experience, conversations with other fishermen and various readings, it is apparent that along the North Atlantic coast, menhaden is its favorite food. Distribution of bluefish in turn influences the distribution of young and adult menhaden.

Disappearance of bluefish in the past has been blamed, for one, on the disappearance of specific food species. Whatever the cause, bluefish have undergone periods of relative abundance and scarcity throughout recorded history, which do not appear related to man's activities in the marine environment. Their waxing and waning, indicating cyclic abundance, has been reflected in commercial and sportfish landings as reported by the National Marine Fisheries Service.

In recent years, commercial and sport fishing catches from the Gulf of Maine to the mid-Atlantic area has substantially increased. Most noteworthy, the bluefish has become the most important sportfish in terms of weight caught in this country. Total catches (commercial and recreational) increased from about 17,500 tons in 1960 to a high of about 70,700 tons in 1975 with a slight decline in 1977 to 64,600 tons. The estimated recreational catch, obtained from marine creel surveys, has comprised approximately 96% of the annual total catch from 1960-1977. The commercial fishery, predominating off the New York — New Jersey area, includes the use of gill nets, haul seines, pound nets, otter trawls, purse seines and hook-and-line.

More research is needed on this species, especially regarding population dynamics of the stocks along our coastline.

This information is implicit for proper management of the fishery. Here in New England, more commercially important groundfish (e.g., cod, haddock and flounder) have been highlighted to the neglect of sportfish species such as bluefish. Besides its obvious recreational and commercial market value, the bluefish is excellent dining fare at any table.

THE FISHERMAN

We have established that many people go bluefishing, some of whom are highly successful. How would I define a successful bluefisherman? My answer is simple — an angler who consistently catches bluefish throughout the fish's stay inshore, which is approximately from the end of May through October on the south side of Cape Cod. The rub, however, is the how-to and where-to. But first let me characterize the fisherman. *Self-discipline, Understanding, Cleverness, Confidence, Endurance, Stamina and Savvy,* spell SUCCESS for a bluefisherman.

Self-discipline is needed to roll out of bed in the morning long before your neighbor's rooster greets the dawn. Having readied sundry gear the night before, the anxious angler becomes a nocturnal traveler in order to arrive on the fishing grounds at twilight. *Understanding* implies that once on the scene, the angler possesses the necessary skill in the use of his or her gear, is knowledgeable of angling techniques and is somewhat familiar with the waters to be fished. Most successful fishing trips begin with a flexible plan of action for the day - dictated by prevailing environmental conditions and knowledge of local bluefish movements.

A successful bluefisherman is always thinking, is occasionally clever and can adjust to a given situation advantageously. Resourcefulness and ingenuity are important assets in effecting continued catches of bluefish whose availability and catchability are influenced by many variables: tide, wind direction and speed, food supply, barometric pressure, water temperature, etc.

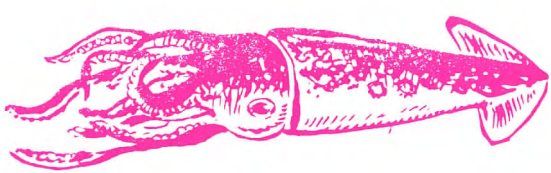
A quiet kind of confidence is exuded by veterans that one can sense. There is determination in their cast, purpose to the retrieve and a methodical approach to the fishing site. You must believe in yourself, remain optimistic and positively feel on every cast that you will catch a fish. Confidence breeds success.

Endurance — the ability to withstand adversity, and, stamina — staying power and persistence, have been demonstrated by all successful bluefishermen. Anyone who has fished in salt water, afloat or ashore, has endured extremes of the elements: searing heat, cold water, dew-drenched mornings, chilly evenings, strong winds, crashing waves, enveloping fog and driving rain. Add to this an attack by pesky insects, slippery, algae-covered rocks and the loathesome job of cleaning tackle after an exhausting day on the briny.

Fun, you say?

Any non-fisherman would gibe that all bluefishermen are masochists and out of their minds. But, the bluefisherman wouldn't have it any other way. Like the commercial fisherman who "go down to the sea in ships," bluefishermen invariably return to the sea and the bluefish make it all worthwhile.

Another trait possessed by successful anglers is savvy, or "fish sense." From hours of experience these fishermen have insight into the fish they seek. The ability to sight finning or swirling fish, recognize a slick on the water's surface and smell bluefish are all within their repertoire. Locating bluefish is not always a matter of chance. Consistent catches have been made over the years at the same locations within a given locale. Catching them then depends upon one's ability to match the lure or bait to the appearance or action of their prey at the time.



". . . bluefishermen invariably return to the sea — and the bluefish make it all worthwhile."

FISHING

Techniques for angling for bluefish include trolling artificial lures on monofilament line, lead-core or wire line; casting poppers, swimming plugs, spoons or jigs; or live-lining natural baits; or fishing chunked bait via drifting, trolling, still-fishing at anchor or casting. I have tried all of these methods with varying degrees of success.

Proven artificial lures for trolling, which also happen to be favorites of mine, are: a yellow rag-mop or jigged eel tipped with red pork rind, fluorescent orange or red surgical tube and a white lead-headed jig garnished with hackle or deer hair and pork rind.

Boat speed and trolling depth are critical factors. To locate fish I prefer to troll in large figure-eight patterns with varying boat speeds. Most often a boat speed that approximates a fast walking pace is effective. Once a fish is hooked, noting the coordinates and boat speed is imperative to effectively fish the same area for possible feeding concentrations.

For trolling, I use six-foot boat rods, with and without roller guides, and conventional reels holding either 40-pound test monofilament, lead-core or wire line. With monofilament, I fish a long line of approximately 100 yards, which is sometimes weighted with a clinch-on sinker. A tip on using lead or wire line is to determine the amount of line to fish in order to troll just off the bottom. I first let out line until my lure hits bottom and then reel in a few turns to the desired depth. If the lure becomes fouled on contact with bottom seaweed or eel grass I retrieve it for cleaning, but only after I have determined how much line there is out. It's easy with lead-core line since it is color-coded every 10 yards. With wire line, marking every ten yards with an indelible felt pen is most helpful.

The action of many trolled lures is enhanced by manually jigging the lure. Converesly, many anglers purport that the best fishermen are their rod holders which are reported to make few mistakes. When using wire line, which has little or no detectable stretch, I refrain from setting the hook on a strike but let the fish hook itself. While using lead-core or monofilament line, where there is pronounced stretching, I invariably set the hook sharply to implant the hook's barb.

Blues can be caught night or day when trolling artificial lures. However, being primarily visual feeders, better fishing occurs in the early morning and evening hours and following midday fasts. Most man-made lures release no odor to stimulate the olfactory sense of bluefish — possibly a limiting factor in fishing for them at night.

Now, let's turn to the use of natural bait — the real thing. Natural baits used alive (live-lining) or dead (whole or chunked) offer advantages and disadvantages when compared to artificials. On the plus side, these baits emit *au naturel* stimuli of smell and/or movement.

Favorite baits include menhaden (pogies), alewives (river herring), squid, mackerel, sea herring and eels. Chumming with ground up fish can greatly facilitate success when you are bait casting or using artificials. Use of a wire leader lessens the chance of cutoffs by errant strikes. Because bluefish often attack prey from the rear, I recommend rigging live bait with at least one hook (single or treble) placed toward the rear of your offering. Once he picks up the bait I don't let him run very far before setting the hook.

While afloat and fishing among a school of adult menhaden being harried by bluefish, an often successful technique involves positioning your boat upwind of the surfacing menhaden. Cast a weighted treble hook beyond these forage fish and let it sink for a few seconds. Then jig the hook smartly through the school until a menhaden is snagged. Now, stop the retrieve and allow the snagged fish to swim with its comrades until the drift of the boat separates this individual from the school. It's at this point that feeding bluefish will often single out the bait and attack. If the bait is taken, allow only a short run before setting the hook. A blue does not often swallow the bait whole but will bite off a portion of it, leaving the rest of the body to float away. The drawback of this technique is in the location of the hook, which is left purely to chance. It is noteworthy to repeat here that when feeding on adult menhaden, bluefish become highly selective and are extremely difficult to catch on artificial lures.

Physical factors alluded to before also influence the catch. Wind speed and direction are important considerations. A wind speed exceeding 15 mph will adversely affect a popper's action. Speeds exceeding 20 mph are a limiting factor in plug casting from a boat. Conversely, on those calm days when the sea is as placid as a mill pond, bluefish are extremely reticent to strike surface poppers. Seemingly with increased visibility at the water's interface, a bluefish can see all too well the lines of the popper, which are not distorted by wave action. This evidently detracts from the lure's replication of live prey. A wind speed of about 8 to 12 mph is ideal, producing the right amount of wave action for effective surface plugging. On the south side of Cape Cod in areas we frequent, a southwest wind sets up an onshore wind-driven current and provides ideal fishing conditions.

Considering the various gear and techniques used to catch bluefish, spincasting with surface poppers has proven most exciting and rewarding to us. The smashing, savage strike on a surface lure by a bluefish is as exciting as the ensuing dogged, spectacular battle that follows. Over the years our catches of bluefish have been abundant, ranging in weight from 1½ pounds to over 14 pounds — all of them falling for our ¾-ounce poppers.

I have learned about bluefish as a biologist and from biologists, as an angler and from anglers, and along the way have had some darn good teachers. Still, I am fully aware that my knowledge is incomplete. Nevertheless, I'm hooked!

Robert P. Lawton is a Senior Marine Fisheries Biologist for the MDMF and a past contributor to Massachusetts Wildlife *(May-June, 1979)*

MARGARET NUTTING

It is so realistic that one of the wild turkeys took off and flew into the panel, believing, no doubt, that those trees and skyline meant freedom.

"It" is a realistic oil painting of a hardwood forest, eight by 16 feet, which provides the backdrop for the latest exhibit of the Division of Fisheries and Wildlife. It was first used at the New England Sportsmen's Travel and Camping Show in Boston during February, where the incident occured. It was shown again at the Eastern Fishing and Outdoor Exposition held at the Boxboro-Sheraton in March.

The painting is the second such mural donated by Leverett, Massachusetts artist Margaret Nutting. A well known artist of natural history and wildlife subjects, Margaret Nutting has many credits to her name including *Massachusetts Audubon,* conservation publications and numerous scientific publications.

Not only the turkey was taken in by the realism of this artist's work — during the hot summer weeks that it took her to complete the murals in her garage, a mud-dauber wasp selected one of her painted trees to build its nest in a hole in the plywood backing.

Photo by Chris Thurlow

The Massachusetts Division of Fisheries and Wildlife is grateful and fortunate to have the services of such a fine talent available for these fine exhibits which are viewed by thousands.

LAST CALL

JUNIOR CONSERVATION CAMP:
JUNE 22 through JULY 4
Write or Call: Division of Fisheries & Wildlife
Field Headquarters, Westboro, MA 01581
(617) 366-4470, 4479

Man and the Balance

"I have met but one or two persons in the course of my life who understood the art of walking — who had a genius, so to speak, for *sauntering:* . . . beautifully derived from idle people who roved the country on the pretense of going to the Holy Land: Sainte Terre . . . a *Saunterer.*"

H. D. Thoreau
(On Walking)

"GONE FISHIN'"

It's a new kind of summer program dedicated to teaching the fine art(s) of salt water fishing to youngsters nine through 16 years of age. A completely ocean-oriented summer camp that teaches everything from ocean ecology, snorkling and harpooning to how to enjoy ocean fare from the grill to the table. It's a camp of limited enrollment since the major classroom is the power boat *Mary E.* It may not be for everyone but for the lovers of sea and surf it may be the best thing to come along in a long, long time. (Gone Fishin', Box 2280, Ogunquit, Maine 03907).

CONSERVATION NEWS — KAPUT

The late, great and newsy publication *Conservation News* printed as an educational free-be by the National Wildlife Federation, ceased publication last December and is sorely missed by writers and editors throughout the country. It was a great twice-a-month piece that kept us all up to date on the comings and goings of conservation efforts throughout the land. They noted in their final issue, for example, that although both are still rare, the whooping cranes and Florida Key deer have made encouraging comebacks: the cranes from a population low of 15 in 1941 to a current high of about 130; and the deer from a low of 50 in 1951 to a current high near 400. They also noted that there are 28 designated wild and scenic rivers — the end result of a program that started in 1963 when 12 rivers were so designated. With the loss of the *News* we have to work a little harder to come up with this type of info.

Natural Resources and Agriculture Committee Chairman, Richard Dwinell, left, with Richard Cronin, Director of the Division of Fisheries and Wildlife, center, and Bradley Gage, Chairman of the Wildlife Board, right, witness the signing of the Proclamation declaring May 12 through May 18 as National Fishing Week by Governor Edward J. King. The theme for the week was, "TAKE A KID FISHING!"

IT CAN COST YOU

Six gasoline retailers paid out $19,000 in fines for installing undersized nozzles on leaded gasoline pumps. The EPA announced that all the violators were California-based gasoline stations.

Our Fisheries and Wildlife employees are not inland-bound "sports" by any means. Here our superintendent Carl Prescott bends his back for a nice bluefish caught last summer. See Bob Lawton's story on page 13 of this issue. Photo by Jack Sheppard.

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