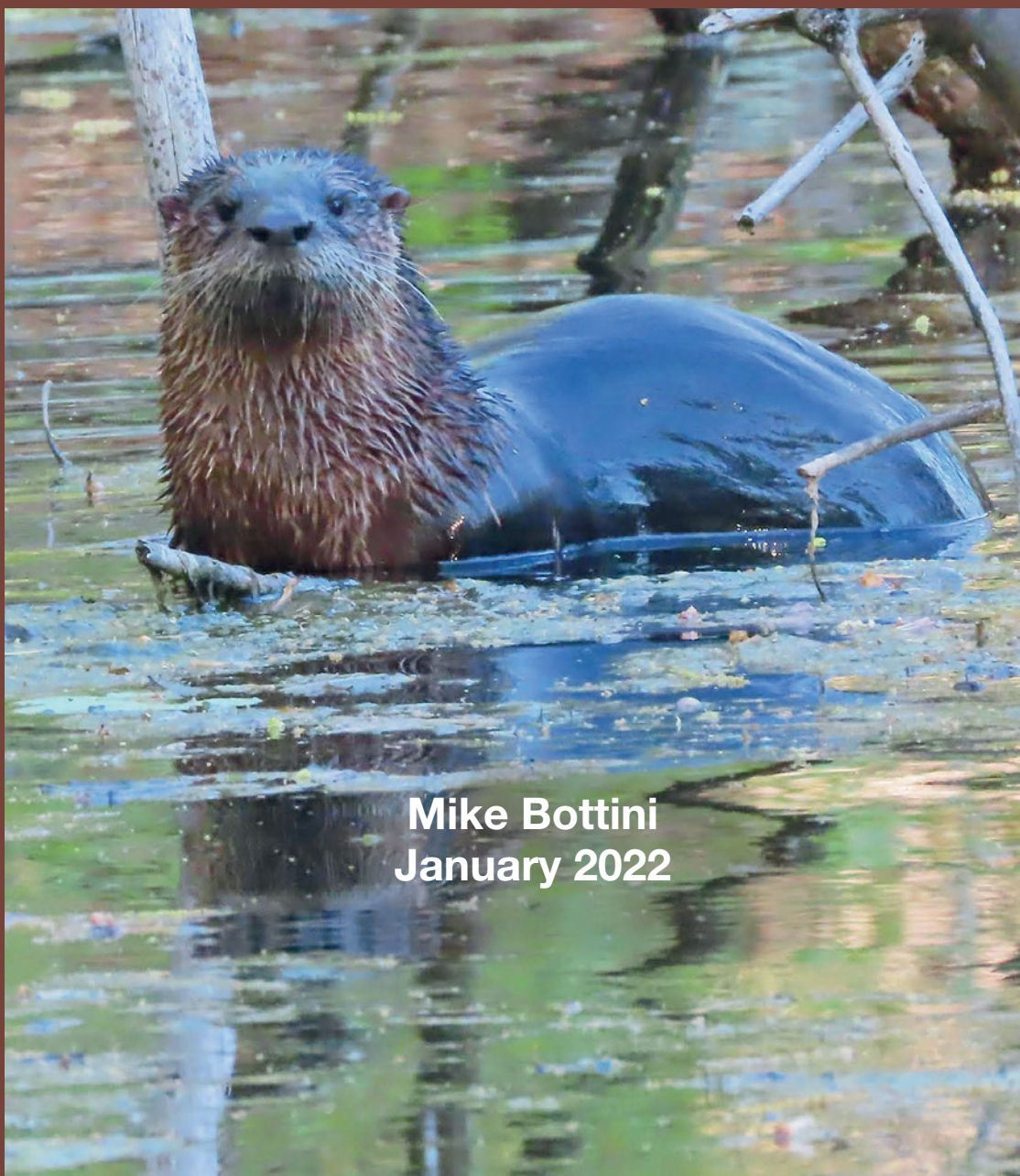
The Long Island River Otter Project's

River Otter Sign and Survey Manual



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NOTE: All photos are by Mike Bottini unless otherwise credited.

Photo 1. Taken at Fuchs Pond, Northport, NY: Mike Zunno.

BACKGROUND

River otters *(Lontra canadensis)* once inhabited most fresh and estuarine waters in North America. Unregulated trapping, habitat loss and pollution resulted in local extirpations in many otter populations, including Long Island and most of New York State. Conservation laws enacted in the 1900s enabled remnant otter populations to slowly expand and re-colonize former habitat. A survey of river otters on Long Island was done by Paul Connor of the New York State Museum and Science Service as part of a general survey of Long Island's mammals over the years 1960 to 1963. No otters or otter sign were encountered at that time. Despite the occasional sightings and roadkills on Long Island in the years since Connor's survey, the status and distribution of otters on the island remained unknown until 2008 when the Long Island River Otter Project was initiated with an island-wide otter survey.

The 2008 survey documented otter sign in seven Long Island watersheds. These were found in two distinct regions of Long Island's north shore: portions of eastern Nassau and western Suffolk counties, and a smaller area 40 miles to the east that included a portion of Southold, Shelter Island and the northwestern corner of East Hampton Town. A follow-up survey in 2018 documented otter sign in 26 watersheds. This increase in distribution over a decade provided evidence that, despite Long Island's fragmented and developed landscape with high potential for otter mortality via motor vehicle collisions, otters were slowly expanding their range on the island. As of 2021, otter home ranges included all the watersheds on the north shore from Oyster Bay east to Orient, the Peconic River watershed and a significant portion of the Peconic Estuary, and two watersheds on the south shore. Much excellent otter habitat on Long Island remains unoccupied, especially on the south shore.

While surveys give an accurate picture of otters' distribution on Long Island, they don't provide an answer to a commonly asked and difficult to answer question: "How many otters do we have here?"

Photo 2. Since otter latrines are usually within 15 feet of the shoreline and quite conspicuous when the leaves are down, surveying by paddle craft is very efficient. This is a useful option where public access to the shoreline is limited.

SURVEYING FOR RIVER OTTER PRESENCE

River otters are elusive, generally most active at night, difficult to observe in the wild, and they have large, overlapping home ranges. These characteristics make them difficult to census. The most practical census technique to determine river otter presence here on Long Island is to survey for their latrines (a.k.a. scent stations) where sign, mainly in the form of scats, provides incontrovertible evidence of the passage of an otter.

Latrine visits by otters on Long Island are most common during the months of November through May and taper off dramatically during the summer and early fall. Surveying is most efficient after the leaves fall in November and before "green-up" in late spring, as the lack of leaves and herbaceous cover makes the latrine sites easier to detect. Fresh snow is a handicap for surveying, covering sign that would otherwise be visible for several weeks.

To distinguish otter latrines that are part of an established home range from that of a transient juvenile dispersing and temporarily marking an area, latrine sites should be visited at least twice during the peak scenting period, with site visits ideally separated by two months or more.

It is assumed that marking at these sites is a way for otters to communicate information with one another. As with many other mammals, scent at latrines most likely communicates information between males and females during the breeding season. Exactly what they are communicating during other times of the year is unknown. Otters are very social creatures; they are not territorial and their individual home ranges overlap. Males often travel in groups, employing cooperative hunting by herding schools of fish into shallow water where prey are more easily captured. Aggression is rare, and latrines may provide information to avoid conflicts among individual otters. More research is needed on this interesting aspect of otter behavior.

DESCRIPTION OF AN OTTER LATRINE

Otter latrines are small sites (generally 8 to 100 square feet) that otters visit to leave their scent and visible sign in the form of scat, and often (but not always) small areas cleared of leaf litter called "scrapes." Otter scat on Long Island is most often found in a shapeless pile composed of fish scales and bones. When fresh, it has a dark green or black color. Pink-, red- and white-colored crab and crayfish remains (exoskeletons) are not uncommon. Both fish and crustacean remains can be tubular in shape. Otters have a very efficient digestive system, with a transit time from ingesting prey to excreting feces of two to four hours (Davis et al. 1992). For comparison, humans have a transit time of 24 – 72 hours (Mayoclinic.org). As a result, their individual scats are usually composed of the same material — fish, crab, crayfish, frog, etc. — and not mixed. Even among fish remains, the size of the scales are usually uniform within each scat, reflecting feeding on small fish such as mummichogs or large fish such as alewives or carp. This aids in estimating the number of individual scats at a latrine site.

Occasionally a jelly-like, clear or yellow-white-colored anal secretion is left. This dries quickly and disappears but is the best material for obtaining a DNA "fingerprint" of the individual otter.

Photo 3. An otter latrine with a small scrape in the pine needles and the tubular-shaped scats of crustacean remains deposited on the pile of needles.

Photo 4. Otter scats are not always placed atop the pile of leaves and duff created by the scrape. Here the scats are a mix of fish and crustacean remains.

Photo 5. When feeding on fish, fresh scat is slimy and has a greenish or black color.

Photo 6. Over time it dries out, first turning a charcoal gray and eventually white.

Photo 7. Otter scats are slow to decompose and visible for weeks, a helpful feature for surveying.

Photo 8. Other favorite otter prey includes crustaceans, such as blue crab and freshwater crayfish.

Photo 9. The arrows point to hard, round objects resembling seeds; this fresh scat could be confused with raccoon scat. These are crayfish gastroliths; they store calcium before molting, enabling a speedier shell hardening process.

Photo 10. Otter scat with bird remains (feathers and bone) is extremely rare on Long Island.

Photo 11. Scat with bones but no fish scales is the remains of frog or bullfrog tadpole, another otter favorite.

Photo 12. This seldom encountered jelly-like mucous material is an anal gland secretion.

Photo 13. It dries quickly into a rubber-like form before disappearing completely.

As a result of their behavior at latrine sites, such as rolling on the ground to dry off, scraping leaves and duff into a pile with their front feet, and stomping with their hind feet to deposit scent from glands located on the hind foot pads, latrines are often obviously disturbed sites cleared of ground vegetation and leaf litter and are easy to discern even from a distance.

Photo 14. A potential otter latrine site under a large conifer at the outlet to small pond in the Nissequogue headwaters.

As remote cameras placed at otter latrine sites have shown, several other wildlife species visit on a regular basis and contribute to the obvious "cleared area" look. Here on Long Island, common visitors include raccoons, deer and a wide variety of waterfowl. Canada geese will occasionally nest on an otter latrine.

The number of distinct scat piles at the latrine may indicate the number of otters utilizing the area and is worth noting. This requires a close look at the scats, some of which may be piled on or very close to others. Obvious distinctions among individual scats would include fish versus crustacean remains, and large fish scales versus small ones. You can also look for relative age of the similarly sized fish remains using the age gradients among photos 5-6-7 above in your estimation of the number of distinct scats. The emphasis here is on "estimation." Long Island latrines may have a single scat in recently recolonized watersheds and as many as 70 in others. The data will be be lumped into ranges, for example: less than five, five to twenty, over twenty.

WHERE TO FIND OTTER LATRINES

Although a significant portion of otter habitat on Long Island includes tidal waters, otter latrines are most often found adjacent to freshwater or, in the case of a berm or dam separating fresh from tidal water, on the elevated land between both. Look for the latrine on elevated, fairly level, dry ground adjacent to and within 15 feet of "swimmable water" for an otter to escape. The latter characteristic rules out many otherwise potential latrine sites (e.g., wooded hummocks, points and islands) adjacent to otter habitat in tidal waters, estuaries and salt marshes, as many of these sites are a distance from swimmable water at low tide. There will be an obvious game trail between the latrine and the water.

Here are five specific locations for otter latrines that will help you in surveying:

1. where otters must exit the water to get around a dam or other obstacle;

Photo 15. Otter latrines can be as small as one square foot, as found alongside this dam on the Nissequogue.

2. on small islands;

Photo16. After learning the characteristics of otter latrines, Mike Laspia at Mashomack Preserve suggested surveying this island in one of the preserve's salt ponds, where a well-used otter latrine was found.

3. on points of land that jut into a lake, pond, river or other waterway;

Photo 17. This latrine is situated on a knoll that juts out into a freshwater pond. The photo was taken during the March breeding season; the larger otter in the foreground (most likely the male) is scent marking while the other (female?) watches. Three months later, an adult and pup were flushed from the cattails nearby, where they had built "couches."

4. at pond inlets, outlets and the confluence of tributary streams; and

Photo 18. In the case of earthen dams with good vegetative cover, in addition to a latrine at the pond's outlet, there may be several other latrines spaced along the length of the dam, as is the case here at Staudingers Pond, East Hampton.

5. where otters exit the water to travel overland to reach another pond or creek — these routes usually follow the shortest possible route from one pond or creek to the other.

Photo 19. This conspicuous and short otter "cross-over latrine" between two freshwater ponds in Southold (the further pond is visible in the background) is regularly visited by many different species of wildlife and contains "sign" of Canada goose (scats and, in one year, a nest), great blue heron, raccoon and deer in addition to otter scats.

These characteristics of otter latrines make it possible to limit field survey time by first locating potential sites on aerial photographs and topographic maps. For example, to prepare for a three-day otter survey on Fishers Island in March 2013, topographic maps were reviewed to identify and mark potential latrine sites. A portion of the topographic map is shown below, illustrating potential "point latrines" and "cross-over latrines." All but one were later verified as otter latrines in the field.

Much of the Middle Farms Pond shoreline was private property and inaccessible. It was surveyed quickly and efficiently by kayak. The location marked by a question mark ("?") at the northeast cove in Island Pond was identified as a potential "cross-over latrine" between Island Pond and the unnamed pond on the north side of the road. However, the survey determined that both sides of the roadbed between the two ponds were so steep that there was no suitable level site for a latrine.

Also note that there were no otter latrines identified between Island Pond or Treasure Pond and the bay (Block Island Sound) despite the potential for a "cross-over latrine" in this area. Although otters will forage for fish and crabs in the nearshore shallow bay, the dynamic nature of this shoreline, with its periodic wash-overs from storms, seems to limit its usefulness as a latrine.

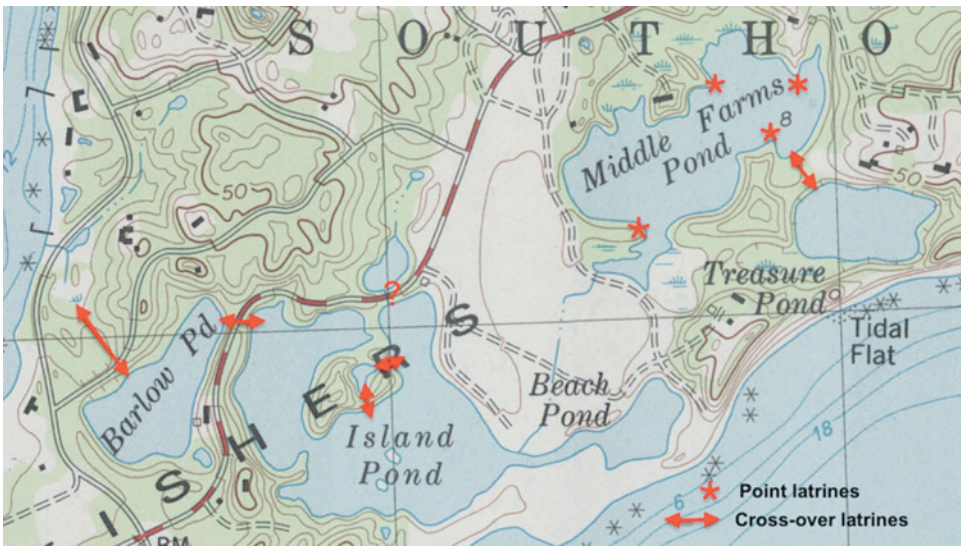

Photo 20. A topographic map showing a portion of Fishers Island with potential otter latrine sites noted and verified. The Middle Farms Pond sites were surveyed by kayak in March, during the breeding season when scenting behavior at latrines is high and the lack of leaves on trees and shrubs enable surveyors to easily discern otter latrine sites.

River otters colonized Fishers Island by making the two-mile crossing from the Connecticut-Rhode Island mainland. Despite their excellent swimming ability (otters can swim 7 mph and make the twenty-mile crossing at Long Island Sound's widest point in 3 to 4 hours), the longest open water swim recorded by a river otter is seven miles (Martha's Vineyard to Nantucket, possibly via Muskeget and Tuckernut Islands). This may reflect an inability among otters, which are nearsighted, to discern land masses that far in the distance in our rather flat landscape, rather than a limitation in the otter's swimming ability.

DISTINGUISHING OTTER SIGN

TRACKS

River otter tracks are most often confused with those of raccoon *(Procyon lotor)* and fisher *(Pekania pennant)*. Since fishers are not found on Long Island, surveyors here need only be concerned with distinguishing between otter and raccoon tracks.

The raccoon is very common throughout Long Island and, as with the otter, it has a strong preference for riparian habitat. Its nocturnal wanderings often follow the shorelines of ponds and streams and intersect nearly every otter latrine found here. A February 2012-May 2013 remote camera study at Long Island otter latrines revealed that raccoons passed through these sites significantly more often than otters.

Both otter and raccoon have five toes on front and hind feet, and their respective foot dimensions overlap in length and width. Otter feet are webbed, but the webbing doesn't always register in tracks.

Photo 21. A typical raccoon trail following the edge of a swamp in the headwaters of the Connetquot River.

It is helpful to examine the foot morphology of these two species as it relates to their tracks.

Photo 22. Topside of otter left hind foot.

Photo 23. Sole of otter hind foot.

The dorsal view (photo 22) of the otter's hind foot reveals its extensive webbing (significantly more than on the front feet) and the ventral view (photo 23) shows its bulbous, oval-shaped toe pads and four circular, velcro-like tabs on the palm pads. The tabs are conduits for scent. At latrine sites, otters will repeatedly stomp their hind feet in a behavior called the "latrine dance" to release scent.

Note the fur between the individual toes and between the toes and palm pads; this fur obscures the webbing in the photo as well as in tracks. The otter's bulbous toe pads often prevent the claws from showing in tracks. Also note the gap (or indentation) between the bulbous toe pads and the palm pads; this gap is often apparent in tracks.

Compare this arrangement with that on the raccoon's hind foot (below). In raccoon tracks, the toes will usually appear directly connected to the palm pad.

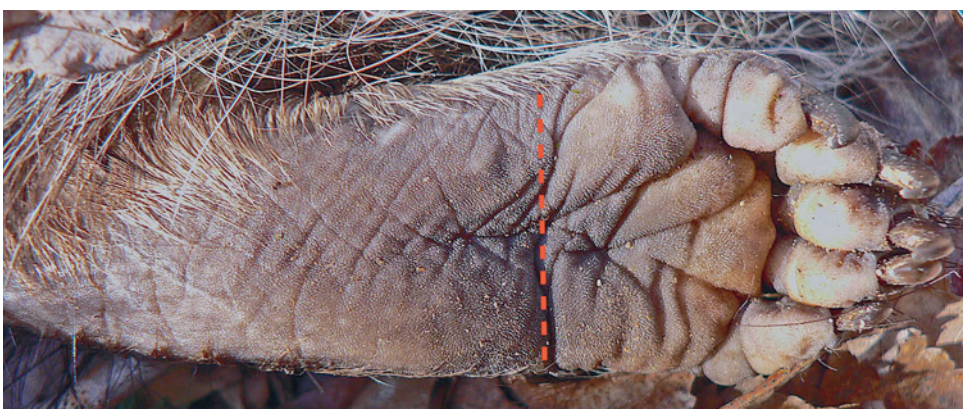

Photo 24. Raccoon left hind foot. Most of the foot (to the left of the red line) often does not register in tracks (except in snow) such that the hind foot appears to be the same size as the front despite its much greater length.

Photos 25 & 26. The long, "fingery," hand-like and very dexterous toes on the front right foot of the raccoon.

Photo 27. Typical prints of raccoon front and hind feet in mud illustrating the front foot's longer toes.

Photo 28. The front left foot of an otter showing its bulbous toe pads.

Keeping in mind these differences in foot morphology, let's examine some tracks of raccoon and otter in sand and snow, and the common gaits of each species in both substrates.

Photo 29. An otter's right front right foot below its hind (Callie Velmachos photo).

Photo 30. The raccoon's left hind foot below its right front.

Note that the otter's bulbous toe pads register deeper than the rest of the toe, resulting in a very faint connection to the palm pad, while the raccoon's toes register a uniform depth and show a connection from the toe tips to the palm pads. The yellow arrow points to the otter hind foot's inner toe that is longer and lower on the foot, as compared to the raccoon hind foot's inner toe (nearest the finger); this is an excellent feature to distinguish between tracks of the two species. The raccoon's front foot can be distinguished from the hind by the longer, more slender toes on the front feet.

One doesn't always encounter perfectly detailed tracks like this, especially in snow, and the common gait, or trail pattern, of each is often more helpful to distinguish between the two species. Raccoons most often use a walking gait where pairs of feet land close to one another: the right hind foot lands next to the left front, and the next pair would be the right front and left hind, then back to the right hind and left front pairing, and so on. A straight line drawn along the leading edges of pair of prints creates a diagonal. The diagonals alternate in the direction it slopes from one pair to the other, as shown by the black lines below.

Photo 31. The raccoon's most commonly encountered track pattern, much different from the otter's typical patterns.

In snow, this ID trick is very valuable. In the photo on the left (below), note that the paired feet are of unequal size, with the larger and smaller impressions alternating to the left and right sides of the trail: the classic raccoon pattern. The center photo is the classic otter lope pattern, with tracks in groups of four showing (starting at bottom of photo): right front, right hind, left front, left hind. Look for that "dropped" or lower inner toe to tell front from hind. The right photo is an otter bounding and belly-flopping into a slide on a snow-covered, frozen pond, a behavior they can't resist even on the flats.

Photo 32. Raccoon walking gait.

Photo 33. Otter's lope gait (Julie Zalesak photo).

Photo 34. Otter slide on pond.

While raccoon tracks are by far the most easily confused with otter on Long Island, the tracks of two other species may cause confusion and are worth mentioning. Both other species are found in riparian habitat and show tail drags in soft substrates.

Photo 35. Snapping turtle tracks traveling from bottom to top of photo,with a trail width of 8-10 inches. (Matt Kaelin photo).

The photo above was taken of an animal emerging from a freshwater pond at the Quogue Wildlife Refuge. The combination of habitat, prominent tail drag, trail width and deep claw marks led the photographer to suspect these were otter tracks. Although the foot in the upper left of the photo registers five clear claw marks (this is a left front foot), this animal has only four toes on its hind feet. Notice the oddly shaped fronts are much wider than long, while the hind feet are nearly perfectly round. Although in this photo the right hind has landed directly on top of the front foot (see "hind over front"), most of the hind feet in the sequence are landing close to but slightly behind the fronts. This is an understep walking gait, the classic track pattern of turtles — in this case, the tracks are of a large snapping turtle.

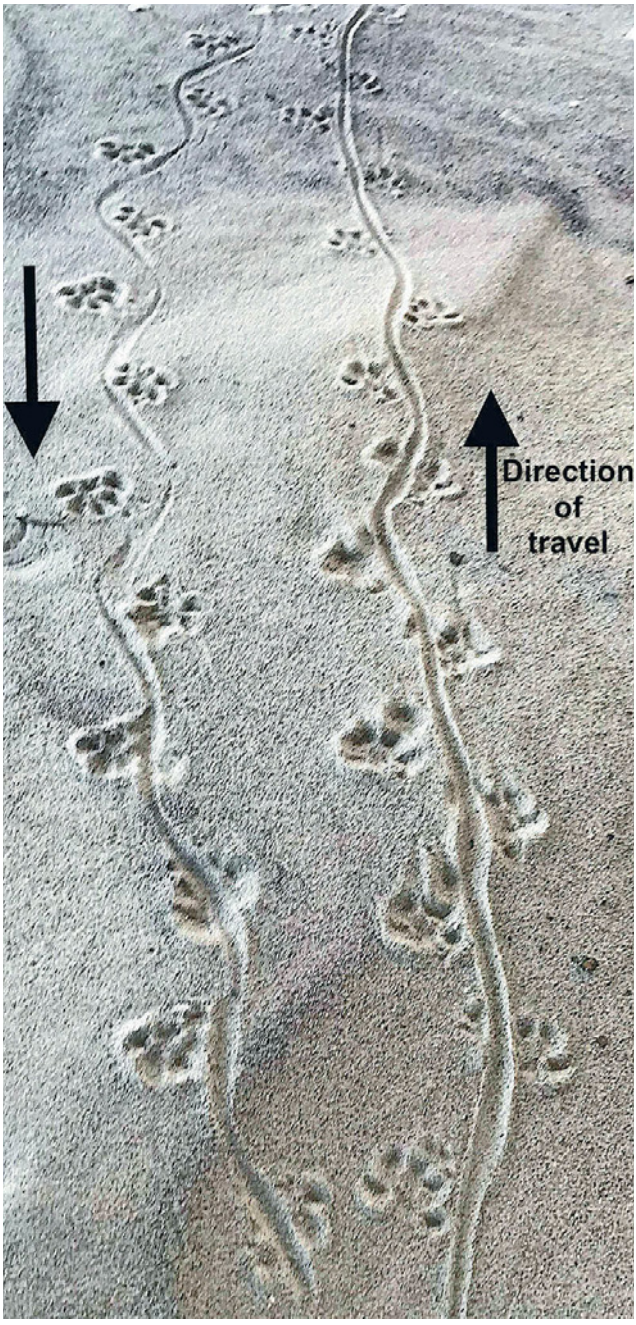

Photo 36. Muskrat tracks photographed in sand on Fire Island, NY, by biologist Greg Greene.

In the photo on the left, the most prominent feature of the trail is the tail drag. You can also see five toes in many of the footprints. These are all hind feet landing on top of their respective front feet, creating what is called a direct register walking gait. Similar images of this track pattern in sand have been photographed by a naturalist working on Fishers Island. In both cases, the tracks were found near water and the photographers thought they had photographed otter tracks.

There is no scale in this photo, but even if there were, one might find that the length and width of these hind feet fall within the measurements of a small otter. If you were to outline one of the prints, you would find it creates a semi-circle; some people refer to this animal's hind footprint as resembling a "crown."

These tracks were made by the common muskrat *(Ondatra zibethicus)*, a rodent who, along with the river otter, is a semi-aquatic mammal that resides in riparian areas. This is a very common species on Long Island. Including its hairless, scaly tail that is flattened from side to side, it measures up to 24 inches in length and weighs up to two pounds. On land it resembles a large vole, but despite its much smaller size, it is often mistaken for an otter when seen swimming.

SCAT

As noted in the section **"DESCRIPTION OF AN OTTER LATRINE"** and photos 3-13 above, otter scats on Long Island are most often composed of the remains (scales, bones and shell fragments) of fish and crustacean prey. Raccoon latrines are often located in the vicinity of otter latrines and, as with the tracks of the two species, distinguishing the scats of both can be confusing when both are feeding on crustaceans (crabs and crayfish). Fortunately, crustaceans are most readily available during the late spring through early fall months and not during the best months (November through April) to survey for otter sign. During late fall through early spring, otter scats are mostly fish remains, and raccoons are feeding on mast (acorns, beechnuts and hickory nuts), carrion, berries and fruits. During that time raccoon scats usually reflect their omnivorous diet, with undigested seeds and fruit husks usually visible. Raccoons will also scavenge carrion, including remnants of fish after filleting. The resulting scats are very otter-like in appearance but easily distinguished by the smell test. See **"CAUTION"** note below.

Photo 37. Raccoon latrine composed of fish (above the ruler) and crayfish remains (below) and elevated above ground on a log adjacent to water.

Photo 38. Raccoon latrine composed of fruit remains found on a log extending from shore into a pond.

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CAUTION: Wildlife scat provides useful species identification clues and is often collected for wildlife diet studies. While I do not know of anyone that has gotten ill from closely examining wildlife scat, you should be aware that there are several dangerous parasites in wildlife scats that could be transmitted to humans. Of particular concern is inhaling dust particles containing eggs of parasites from old, dried-out raccoon scats

OTTER SLIDES

Otters are known for their energetic play behavior, including sliding down mud- or snow-covered slopes. However, many otter researchers have only witnessed sliding behavior as a form of locomotion and not a recurring play behavior at a particular location. Evidence of slides can be found where otters travel around dams and drop down to the stream below, or on snow-covered slopes as they move overland from one pond or creek to another. But most otter slides on Long Island occur on the level surfaces of frozen ponds (photo 34).

In preparation for the first island-wide survey of otters in 2008, the NYSDEC Region 1 furbearer biologist suggested searching the freshwater portion of the Carmans River. Although the NYSDEC had no data on otter distribution on Long Island, they had received reports from fishermen of dozens of otter slides along the banks of that river.

A survey of the river bank by canoe revealed what the fishermen were referring to: short, worn paths (and lots of them) leading up the steep, 6- to 12-inch-high embankment to small, level, moss-covered resting areas. These areas were created by waterfowl, as indicated by the amount of waterfowl scat and feathers on the level areas. No otter sign was found.

Photo 39. Game trail to a goose nest; not an otter slide.

Still, game trails leading from the water to the top of a level embankment (photo 39) are worth examining. Waterfowl nests have been found on otter latrine sites, as was the case at a Southold "cross-over latrine" used by otters as a shortcut between two ponds (photo 40). A remote camera was set there one fall and retrieved in spring. Among the hundreds of Canada goose photos was a sequence where an otter came by and was confronted by a very agitated male goose. After a brief standoff, the otter calmly turned around and retraced its steps back to the other pond.

Photo 40. Canada goose nest at an otter latrine.

OTTER COUCHES OR BEDS

A year-long, remote camera study of behavior at otter latrine sites on Long Island revealed that among the 175 otter visits recorded, 85% lasted less than a minute. Clearly, these were not resting or grooming sites visited between periods of fishing. Studies elsewhere within the river otter's range in North America found that beaver bank dens and logjams on rivers and lakes were favored resting sites for otters, accounting for 50% of resting sites used by instrumented otters in one four-year study (Melquist and Hornocker 1983). Beaver bank dens and logjams are not found on Long Island. Otters spend a good deal of time on land, an average of up to 75% of each day, and little is known about the types of resting sites that our resident Long Island otters are utilizing.

While retrieving remote cameras by kayak in June 2015, three otters were flushed from a large stand of cattails. An investigation revealed a network of dry bedding areas created by pushing the cattail stalks down to form mats over the marsh. These are referred to as otter "couches" or "beds." They were completely hidden from view, not easily approached quietly, and protected from the wind. Stands of phragmites, which are ubiquitous in Long Island's riparian areas, may also provide suitable resting sites for otters. They were found to be favored resting areas for females with pups in Nebraska (Williams 2011). Drones could be useful in surveying marshes for otter resting areas.

There was an abundance of otter scat at the beds, as much as at any otter latrine on Long Island (some is visible near the tape measure in the photo on the right). It is unclear whether this qualifies as an otter latrine or "scent station" since most of the scat material was in shallow water and may not retain scent for communication with other otters.

Photos 41 & 42. Otters created "beds" or "couches" for resting in the middle of this dense stand of cattails in Southold.

DENS

Several published studies found that otters use a wide variety of temporary den types based on availability and convenience. A 16-month study in Idaho found that a single otter used at least 88 different den and resting sites (the latter would include couches) within its home range. Of the 1,283 resting sites identified among the otters with implanted tracking devices, 38% were beaver lodges and bank dens and another 8% were snow and ice caves (Melquist and Hornocker 1983). Unlike couches or beds constructed in secluded areas of riparian vegetation, enclosed dens may provide an extra layer of protection from rain, snow and cold temperatures and therefore may assist otters in meeting their energy needs and reducing thermal stress during the winter months. It is not clear how important enclosed den sites as resting areas are on Long Island, with its relatively mild winters. But dens may be important for giving birth and raising young.

Photo 43. A "snow cave" created by otters in a cattail marsh.

While snowshoeing on a frozen freshwater pond on eastern Long Island, fresh otter tracks and slides were followed to a groundwater seep or spring where the ice was very thin and the otters had maintained an opening to get in and out of the water to fish. A bit further on the tracks led to the edge of a cattail marsh. The cattails acted like snow fencing, trapping snow blowing off the pond and piling it up as much as four feet deep. Here the tracks led to a series of snow caves that the otters had fashioned by tunneling into the snowdrifts.

The snow cave pictured here sat over a small spring hole that enabled the otters to swim out into the pond to fish. It was not clear if the otters used these snow cave microenvironments as energy-saving resting places. This would not be a den site for having young, but it was an interesting find.

Photo 44. This expansive, disturbed area littered with otter scats was the largest latrine documented on Fishers Island during the 2013 survey.

Photo 45. At one end of this large latrine on Fishers Island was a den, possibly a natal den.

Unfortunately, there is often no clear distinction made in the literature between dens as resting areas and natal dens where young are born. Parturition on Long Island can be in early March when weather is quite cool. Otter pups are born blind, sparsely furred and quite helpless. Their eyes don't open until three weeks of age, and it takes at least a month before they can hold their head up and crawl. They do not leave the natal den until 2.5 months old.

Initially at least, the female is solely responsible for care of the litter. She must juggle keeping the pups warm, safe and fed in the den, while meeting her own increased energy needs during lactation. The latter requires that she leave the den to hunt. Therefore, the choice of a natal den site in terms of shelter and proximity to food resources may be quite important.

Another interesting aspect of the otter's reproductive behavior is that, following parturition, the female enters estrus. She advertises her condition by marking at latrine sites to attract males but must be careful not to attract a male to the natal den as mature males may kill the pups. The male may spend several days with the female during this time. This is another tricky juggling act for the female: time away from caring for the newborn pups and time mating with a male that poses a threat to her pups.

Based on the amount of disturbance, scat and cleared area found on Fishers Island and depicted in photos 44 and 45, it was described as a "den site." However, there was no proof that it was used to have young. No natal den sites have been documented on Long Island. This is another important aspect of river otter ecology that needs more research and investigation.

BROWNOUTS

At potential otter latrine sites with moss or other low-growing green vegetation, repeated deposits of nitrogen-rich urine and feces may eventually kill the vegetation, creating very conspicuous brown-colored areas. As mentioned earlier, other wildlife species, including raccoons and a variety of waterfowl, often pass through and rest at potential otter latrine sites as well as at established otter latrines, and brownouts can be created by excretions from these other animals. Although the presence of brownouts alone cannot be used to document otter latrines, these are worth keeping an eye out for and, when noted, making a close examination for otter scat when surveying.

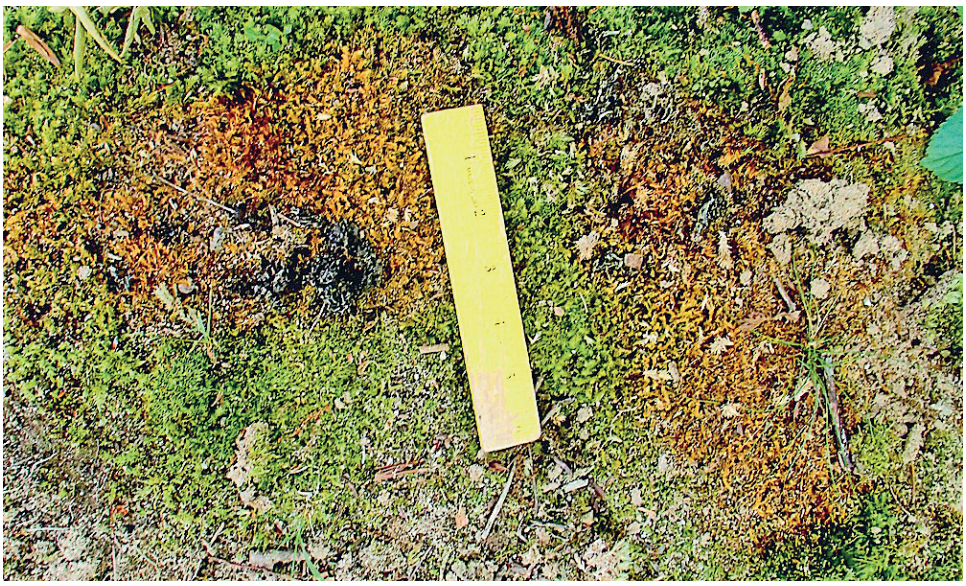

Photo 46. Brownout in a bed of moss caused by otter urine and scat at an otter latrine.

PUSHUPS

This relatively rare otter sign occurs in certain situations on ponds in winter when an otter is fishing and the pond ice is thin, or when falling snow forms a layer of slush on the pond surface. As the otter surfaces after each dive, either for air or to eat its prey (unless the otter catches a very large fish, such as a carp, it will eat its prey in the water at the surface), it pushes the thin ice or slush upward with its head to form a raised rim around a 6-8 inch diameter hole (Photo 47).

This is not to be confused with the more commonly seen holes that have a radial or star-shaped pattern and no raised rim (Photo 48). Thoreau described these as "spider web or rosette figures in the ice." An explanation of how these interesting ice features form can be found at: https://aslopubs.onlinelibrary.wiley.com/doi/pdf/10.4319/lo.1965.10.suppl2.r29

Photos 47. Note the raised rim around the edge of these otter "pushups." Photo by Kevin Walsh.

Photo 48. Naturally occurring ice holes. Photo by Kevin Walsh at Lakeland County Park.

PHOTOGRAPHING TRACKS & SIGN

OTTER LATRINES.

Take at least three photos — one a close-up of the scat with a ruler, coin or other object in the frame for scale; another of the overall latrine with scat and scrape visible; and a third photo of the latrine's proximity to water.

TRACKS.

1. Scale is essential. Ideally, use a ruler or measuring tape. Lacking that, a coin, lens cap, hand or foot will work in a pinch. Place it as close to the track as you can without disturbing the track.
2. Keep the camera lens as parallel to the plane of the track as possible. This usually means standing over the track and straddling it.
3. Strong contrast can result in misleading photos. If shadows are very strong, shoot the track, then try to position a leg, or other body part to cast a uniform shadow over the track and shoot it again. Try experimenting with a flashlight (or cell phone light) to create contrast; it can be surprisingly helpful in highlighting track details.
4. Photograph closeups of a single imprint, one of a front and one of a hind, as well as a wide-angle view of a string of several imprints to show the overall track pattern and gait.

MITIGATING OTTER MOTOR-VEHICLE COLLISIONS

In addition to continuing to document the range expansion of otters, Seatuck's Long Island River Otter Project includes an effort to mitigate otter motor-vehicle collisions, likely the main source of otter mortality on Long Island. It is anticipated that as otters begin to colonize the island's more heavily developed south shore, we will see a significant increase in otter roadkills.

A significant number of otter roadkills occur at dams. Some dams are situated such that otters traveling in either direction can exit the water, travel a short distance overland, and re-enter the water on the other side of the dam without crossing a road. Other sites do not offer that option, and otters are forced onto a road. In most of these cases, a simple ramp or staircase can be installed on the dam. In 2021, Seatuck installed a cinderblock staircase (shown in photo 49) after an otter was killed crossing the road adjacent to the dam. A video camera verified that the remaining otters use the staircase instead of crossing the road.

Photo 49. A simple staircase to scale the vertical dam (Enrico Nardone photo).

Photo 50. Verification that otters use it!

Anticipating that otters will be expanding their range along Long Island's south shore, Seatuck plans to preempt losing otters to motor vehicle collisions by identifying potential problem dam sites and installing mitigation measures. Some of this work can be dove-tailed with Seatuck's program to provide access to spawning grounds for river herring.

Mitigating other known otter roadkill sites that do not involve installing a simple staircase or ramp on the downstream side of a dam can be more challenging. These road-crossing sites are used by otters traveling from one pond or creek to another. Otters are creatures of habit, and overland travel between ponds, creeks and watersheds is done using specific routes. The first challenge is identifying the exact crossing point on the road, which may be some distance from where an otter carcass is found.

Snow cover can be very helpful in this effort. Since an otter may not revisit specific areas in its large home range for four to six weeks, conducting surveys when there is snow cover makes it easier to determine where otters are crossing roads. With the help of a timely snowfall and excellent tracking skills, Peter Janow managed to document two new otter sites and pin down the exact route otters take to cross Waterside Road in Northport (the site of a female otter roadkill in 2012). With this information and a trail cam, he was able to obtain photos of a female and two pups using the route the following July.

This overland route links Blanchard Lake and the Crab Meadow-Fuchs Pond-Makamah Preserve complex, where otter latrines have been mapped and otters have been photographed.

With excellent documentation of otters using this area over the past nine years and the crossing location on Waterside Road known, the last question is: "what is the appropriate mitigation measure for this site?" It was decided that speed bumps to slow traffic down would be the most feasible and easy to implement option in this location.

Photo 51. Snow and tracks enabled this road crossing to be pinpointed (Peter Janow photo).

Photo 52. A female with two 5-month-old pups approaches Waterside Road in July (Peter Janow photo).

*******Otter roadkill sightings*******

Otter roadkills are unfortunate events, but useful information can be obtained from the carcasses. If you see an otter carcass, please contact: NYSDEC Wildlife Office at 631-444-0310 and Mike Bottini at 631-267-5228. Provide the location of the carcass, your name and your contact information.

Photo 53. A female otter killed by a motorist near Northwest Harbor in East Hampton in March 2020.

OTTER SIGHTINGS

Otters are active throughout the year. Most movement, such as hunting and traveling, occurs at night, but diurnal activity is common during winter and in other seasons where human disturbance is rare. Even on Long Island, there are many pockets of isolated riparian habitat where otters have been seen and photographed during daylight hours throughout the year.

Although otters spend most of their time on land, most otter sightings have been of otters in the water, where they are more easily viewed from a distance. The relative sizes and distinguishing features of our semi-aquatic mammals — otters, mink, beavers and muskrats, as well as the aquatic seal species found here — are quite apparent when viewed on land but can be very difficult to discern when they are in the water. Most otter photos and sighting reports from Long Island are of the more common muskrat.

Photo 54. The otter's short legs, streamlined body and unusual tail makes it easy to ID when viewed on land. Note its rounded snout, bulbous nose pad and relatively short fur (Sarah Walkley photo).

Photo 55. Note the muskrat's pointed face, small nose pad and the flat aft end of its tail (Dell Cullum photo).

Excluding their respective unusual tails, the otter's streamlined, torpedo-shaped body ranges 2-3 feet in length while the muskrat's, at 10-14 inches, is less than half that length. Tails comprise approximately 40% of total body length; nose to tip of tail measurements are 3-4.5 feet for otters and 1.3-2.3 feet for muskrats.

The otter's muscular tail is thickest where it is attached to the body and it tapers to a point. It is slightly flattened horizontally (top to bottom), covered with short, dense fur and used to propel the otter through the water with an undulating, dolphin-like motion. Combined with their large, webbed hind feet, they can reach swim speeds up to 7 mph.

The muskrat's tail is covered with scales and very sparsely furred. It is round for a short distance closest to the rump, becomes vertically compressed towards the tip, and serves mainly as a rudder. A side-to-side sculling motion provides some forward propulsion, but most of its 1.6 mph maximum swim speed is generated by alternating kicks of its hind legs.

There are several things to look for to distinguish between an otter and a muskrat in the water. The most obvious and reliable is the otter's habit of raising its head and upper chest completely out of the water to scan the surrounding area, a behavior called "periscoping." Otters seen in the water are usually fishing and constantly diving and surfacing. A muskrat sighted in open water will usually swim at the surface and rarely dive, maintaining a low profile with just its eyes, ears, nose, upper part of its head and possibly its back visible. Muskrats will also raise their tail partially or completely out of the water as they swim at the surface, a feature that shows up clearly in many photographs.

Photo 56. The otter on the right is "periscoping", a behavior in which the head and part of the neck is visible; a useful feature to distinguish otters from beaver and muskrat when swimming. Photo by Joe Kelly on the Nissequogue River.

Photo 57. This muskrat photographed on Fishers Island is swimming with its tail up and out of the water, a common behavior elsewhere in its range (Justine Kibbe photo).

More difficult distinctions include:

1. the broad, rounded face of the otter versus the muskrat's narrow, pointed face;
2. the prominent, bulbous nose pad of the otter versus the muskrat's small nose pad;
3. swimming with vegetation protruding from the mouth — this would be a muskrat taking food items to a safe, sheltered location to feed.

Photo 58. Muskrats are often seen swimming with plant material in their mouths (USFWS photo).

Photo 59. Otter with eel at Marion Lake, Southold. (Carolyn Bunn photo).

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Photo 60. Otter at Long Pond Greenbelt latrine, Southampton.

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Although many photos of tracks, scats and even live animals turned out to be otter imposters, many were excellent leads that helped document the otter's slow recolonization of Long Island. This project would have been very difficult to pull off without your help. Thanks to all of you!

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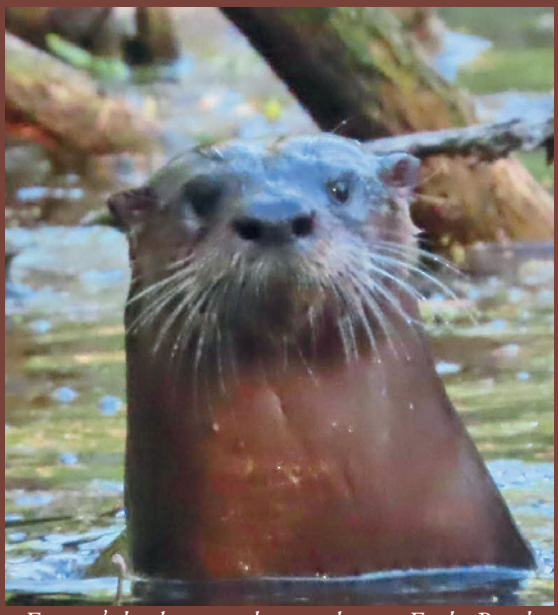
First known photo of a river otter on Long Island, while feeding on golden shiner. Taken by Rob Sendlein at St. John's Pond, Cold Spring Harbor, December 2008.



Front & back cover photos taken at Fuchs Pond, Northport, NY: Mike Zunno.

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