The Saw-whet Owl Banding Project

Danielle Smith

Owls are unique birds that have fascinated humans for centuries. Despite their intrigue, there is limited information available about their migration habits. Their mysterious and alluring qualities are, perhaps, due in large part to their nocturnal activities.

This banding project was the first of its kind in New England. It tracks the movement of Northern Saw-whet Owls (*Aegolius acadicus*) through specific areas at the Massachusetts Audubon Society's Daniel Webster Wildlife Sanctuary and the Metropolitan District Commission's Blue Hills Reservation, seeking to shed light on such questions as:

- What owl species pass through the banding sites?
- How many individuals pass through each night?
- How do these birds respond to the audio lure?
- What length of time do they spend in this area?
- How do weather conditions affect their movements?

Findings for this study were initially collected over a four-year period from November 1994 through March 1998. Information was gathered through the bird banding sites in the two areas mentioned. At the point of capture, the following data were collected: wing and tail measurements, weight, age, sex, overall health, time of capture, net number, shelf in net, direction bird was heading when captured, and weather.

1994: The First Year

Three mist nets were set up in a triangle on the edge of a field at Daniel Webster Wildlife Sanctuary in Marshfield, Massachusetts. A battery-operated audio lure was placed in the center for broadcasting Saw-whet Owl vocalizations. This was played throughout the night on different occasions. Weather data such as wind speed, wind direction, temperature, cloud cover, and frontal movements were recorded.

MIKE MCWADE

The author and assistant (Norman Smith) setting up mist nets at Daniel Webster Wildlife Sanctuary (note audio lure on the ground)

Captures. A total of ten owls were captured and banded: seven Saw-whet, two Screech (*Otus asio*), and one Barred (*Strix varia*). These were the first Saw-whet Owl and Barred Owl records for this wildlife sanctuary. Other owls in the area that were identified but not captured included Short-eared Owls (*Asio flammeus*), Long-eared Owls (*Asio otus*), and Great Horned Owls (*Bubo virginianus*).

Improving the Banding Stations. In order to obtain more data, areas of improvement were identified for subsequent study years. We felt we should expand the mist net setup and increase the number of banding locations within this study area. On one very memorable night, a deer ran through our banding station, destroying two of our mist nets. It became obvious that a night vision scope would be needed to monitor the nets and watch for large mammals before they could cause damage to the equipment, as well as observe owl movements in the area.

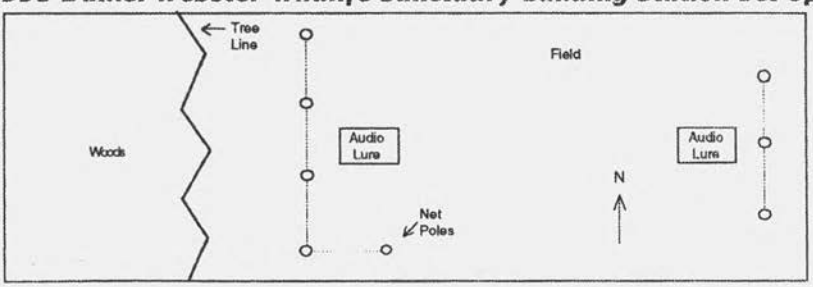
Because of the thick layer of knapweed covering the ground, the delicate mist nets became entangled in this underbrush. They were riddled with holes in the bottom trammels of the nets. Since this is the area of the nets where the majority of owls were captured, mowing of the knapweed was a necessary step before setting up for next year.

1995: The Second Year

In preparation for setting up the banding stations, we were able to use a tractor from Massachusetts Audubon Society's South Shore Sanctuaries. We mowed down the knapweed in the area of last year's banding site and also cleared an area in the field adjacent to this site. Our plan was to set up another banding station there to improve our coverage of the area. Funding from the Nuttall Ornithological Club assisted in the purchase of the necessary night vision scope.

The mist nets for the additional banding site were set up with three in a row and one jutting out perpendicular to this row. The diagram below illustrates this setup.

1995 Daniel Webster Wildlife Sanctuary Banding Station Set Up



Six mist nets were used, all 12m x 2.6m x 60mm.

We began using the banding station in mid-October without a single capture until the end of that month. We believe poor weather conditions and excessive winds were the reason for the lack of movement. At the end of November, a strong cold front approached and stimulated quite a bit of owl migration movement.

Using our new night vision scope, we were able to observe owl migration over the field and also rabbits, deer, and coyotes. On one occasion, we watched while coyotes chased Canada Geese (*Branta canadensis*) into our mist nets, resulting in destroyed nets and bent poles. Through the use of the night vision scope, we also discovered that a Great Horned Owl spent time perched atop one of our twenty-foot net poles and remained there for most of the evening.

NORMAN SMITH

The author with her first Northern Saw-whet Owl at Daniel Webster Sanctuary

Captures. A total of fifty-three owls were captured during 1995: forty-six Saw-whet Owls (seventeen in one night) plus our first recapture, one Long-eared Owl, one Great Horned Owl, three Barred Owls, and one Screech Owl. All of these captures, except the three Barred Owls, occurred in the original banding site. We were disappointed that no captures were made in our new, second banding area. Our audio lure played vocalizations from several different species of owls, including Saw-whet, Long-eared, Short-eared, and Boreal (*Aegolius funereus*). We found that all the captures this year happened when Saw-whet Owl vocalizations were played.

Improving the Number of Captures. Thus far, we had been tracking fall owl migration, when the birds head south for the winter. We now decided to set up our banding station in March when owls migrate north. Our plans included purchasing a weather station to accurately read the wind velocity and direction at the banding sites. This would improve our current method of recording the temperature at the site and supplementing the data with those collected at the Blue Hills Weather Observatory in Milton, Massachusetts.

1996: The Third Year

Daniel Webster Wildlife Sanctuary

One evening in March we attempted to capture owls migrating north. The lack of success on this damp, cold, and windy night defeated our enthusiasm for this particular idea. With no break in the poor weather conditions in sight, we packed up our equipment and waited for fall to resume our project.

Three mist nets were set up on the west side of the field next to each other. The audio lure was placed between the nets and the field and played only the vocalizations of a Saw-whet Owl. On the east side of the field, two mist nets were set up parallel to the edge of the field. Another audio lure was placed between these nets and the field, broadcasting the vocalizations of a Boreal Owl. We set up two more nets

perpendicular to the two sites, running east to west in the large field adjacent to the Osprey pole. No audio lure was used with these nets. We were trying to determine how important the audio lure was to capturing owls.

Captures. A total of three Saw-whet Owls were captured this year at Daniel Webster Wildlife Sanctuary. This is a poor turnout for the fourteen nights this banding operation was in progress. The owls were captured in the mist nets where the Saw-whet Owl vocalizations were played.

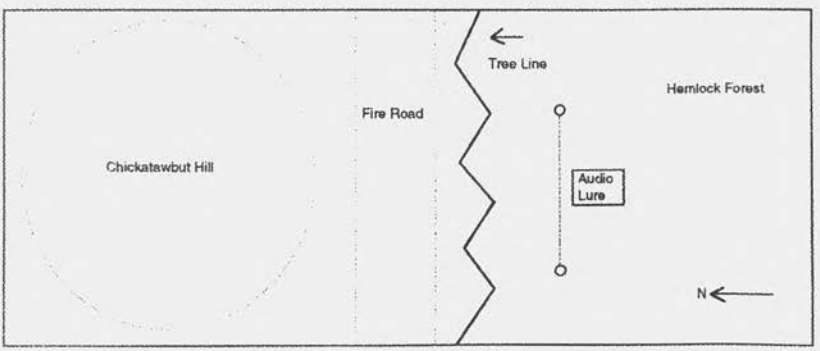
Improving the Number of Captures. The lack of success in Marshfield caused us to wonder whether the owls had an alternative migration route, or if it was a low movement year for owl migration. We decided to set up another banding station in the Blue Hills Reservation and chose a site at Chickatawbut Hill, located in Quincy, Massachusetts. We have used this same location since 1982 to capture and band migrating hawks and thought this location may be a shared migration route for both nocturnal and diurnal raptors. Testing the theory was accomplished by setting up a banding station with an audio lure of Saw-whet Owl vocalizations. After eleven nights, we came to the conclusion that this was an unlikely migration route for owls. The constant hilltop wind kept the mist nets in perpetual motion, which created a whistling noise. No owl captures were made.

A new site was chosen in a hemlock forest, adjacent to a red maple swamp, at the base of Chickatawbut Hill. At this site, only one mist net was set up, and the audio lure played a combination of Saw-whet and Boreal owl vocalizations.

Blue Hill Reservation

Captures. Banding continued successfully at this new site for seventeen nights, with a total of thirty-four owls captured: thirty Saw-whet Owls, one Screech Owl, one Great Horned Owl and two Boreal Owls. The most memorable capture this year was the Boreal Owls. Both flew into the same end of the mist net between 11:30 p.m. and 12:00 a.m. on December 30. The male weighed in at 178 grams, and the female, being

1996 Blue Hills Reservation Banding Station Set Up



One mist net of 12m x 2.6m x 60mm was used.

much larger, weighed in at 195 grams. The female Boreal Owl was extremely aggressive and made it a challenge to remove her from the mist net.

NORMAN SMITH

Female Boreal Owl

Replacing Equipment. After three years of use, the mist nets had lost their strength and needed to be replaced. Three audio lures, consisting of cassette players and endless tapes, had also seen better days, after many hours of use and exposure to the elements. At this point, we felt it necessary to replace worn-out equipment for the following year's operations. To date, our most valuable purchase has been the night vision scope. It has allowed us to observe activity around the banding stations that we would otherwise have missed.

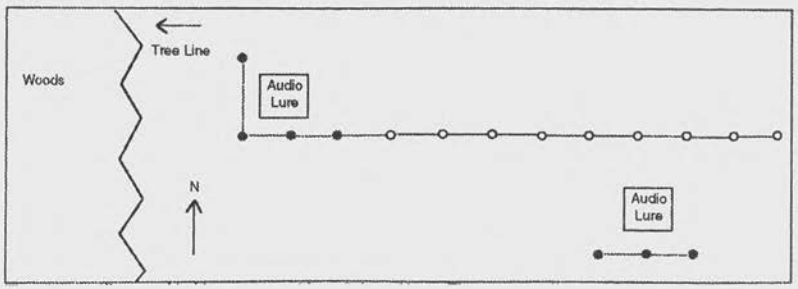
1997: The Fourth Year

Daniel Webster Wildlife Sanctuary

Spring Captures. This year, we again decided to set up the banding station at Daniel Webster Wildlife Sanctuary in the spring and see what owls were moving through the area. One mist net was set up with the audio lure playing only Saw-whet Owl vocalizations. During the five nights of banding, no owls were captured. We feel the wind speed, being more than fifteen miles per hour each night, had an effect on the captures. A Saw-whet Owl was heard on two different evenings, but because we did not capture it, we were unable to tell whether it was the same bird both nights or two different ones.

Fall Captures. In the fall, we set up the banding station with twelve mist nets across the field. We also set up nets on the far west end of the field with an audio lure playing Saw-whet Owl vocalizations. During the twelve nights of operation, a total of

1997 Daniel Webster Wildlife Sanctuary Fall Set Up



Mist nets between the dark-colored poles were 12m x 2.6m x 60mm. Those between the open poles were 12m x 6m x 100mm.

five Saw-whet Owls were captured. Many Great Horned Owls and Screech Owls were heard on a regular basis. Using the night vision scope, we observed as many as seven Short-eared Owls and eleven Long-eared Owls in view at one time during this banding operation.

Blue Hills Reservation

Captures. In the fall of 1997, we set up our banding site in the Blue Hills Reservation. We ran the operation for a total of thirteen nights, and seven Saw-whet Owls were banded. One of these owls was a recapture that was originally banded at the Daniel Webster Wildlife Sanctuary in 1994.

Points of Interest. During our 1997 Blue Hills banding operation, men riding all-terrain vehicles, dressed in camouflage and carrying guns, disturbed us. We witnessed them at all hours of the night, driving vehicles on trails in the reservation. Both of these activities are prohibited so we informed the Environmental Police. This, being a potential threat to our safety and banding equipment, influenced the outcome of this season's operations in the Blue Hills Reservation.

Outside of the owl banding operation this year, we were fortunate enough to have banded some impressive diurnal raptors. At our Chickatawbut Hill banding station we captured our first Golden Eagle (*Aquila chrysaetos*) on November 19, 1997. On January 10, 1998, at Logan Airport, a Gyrfalcon (*Falco rusticolus*) was captured and banded.

Conclusions

The success of this study can be measured through the quality of the information we derive from the data collected over the four-year period. Our data suggest that more Saw-whet Owls migrate through this area of New England than had been previously suspected. By adding the alternative location, the Blue Hills Reservation in Quincy, to our study area, we were able to continue collecting data on owl migration when there was little success with the banding at Daniel Webster Wildlife Sanctuary in Marshfield. The lack of Saw-whet Owls being captured at Daniel Webster in 1996 and 1997 suggests that, perhaps, there were fewer owls migrating during those years, or weather conditions changed the migration routes.

NORMAN SMITH

Joshua Smith with three Northern Saw-whet Owls

This preliminary research indicates that, indeed, Saw-whet Owls do migrate through this area in varying numbers. The audio lure has proved to be an effective piece of equipment for calling migrating owls into the mist nets. Weather conditions also play an

Owl Banding Data, 1994 - 2001

		Season One		Season Two		Season Three		Season Four		Season Five		Season Six		Season Seven		Season Eight	
Year	Location	1994 Spring	1994 Fall	1995 Spring	1995 Fall	1996 Spring	1996 Fall	1997 Spring	1997 Fall	1998 Spring	1998 Fall	1999 Spring	1999 Fall	2000 Spring	2000 Fall	2001 Spring	2001 Fall
NSWO	Blue Hills						30		7	1	1		79	2	29		22
	DWWS		7		47	2	1		5	1			195	2	9		83
	Whitman*												36				
	PM#												101				62
Totals		0	7	0	47 (1@)	2	31	0	12 (1@)	2	1	0	411 (5@)	4	38	0	167
EASO	Blue Hills						1						1				
	DWWS		2		1								3				1
	Whitman*												2				
Totals		0	2	0	1	0	1	0	0	0	0	0	6	0	0	0	1
LEOW	DWWS				1					7		5	7				1
	PM#												1				
Totals		0	0	0	1	0	0	0	0	7	0	5	8	0	0	0	1
SEOW	DWWS									3							
Totals		0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
GHOW	Blue Hills					1											
	DWWS			1						3					1		
Totals		0	0	1	0	1	0	0	0	3	0	0	0	0	1	0	0
BAOW	Blue Hills				3												
	DWWS		1														
	PM#												1				
Totals		0	1	0	3	0	0	0	0	0	0	0	1	0	0	0	0
BOOW	Blue Hills						2										
Totals		0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0

* Erin Street
# Peaceful Meadows
@ Retraps, included in total

important role in migration movement from night to night. When we experienced a cold spell, we saw an increased number of migrating Saw-whet Owls. However, when the wind was 15 mph or greater, almost no owls were captured, most likely, due to the movement of the nets. We are not yet able to determine the length of time a Saw-whet Owl spends in this region. Further research in the future using radio transmitters may answer this question.

After completing the initial four years of the project, 1994-1997, we have continued the banding operation through the fall of 2001. In 1999, our best year to date, we banded 406 Saw-whet Owls, including a new site at Peaceful Meadows Farm in Whitman. At the end of the season we placed a mist net and audio lure in our backyard located in downtown Whitman, and to our surprise we captured thirty-six Saw-whet Owls and two Screech owls. Our best night was at Daniel Webster Sanctuary where we captured thirty-seven Saw-whet Owls and two Long-eared Owls. Without this banding operation these owls would have passed through undetected. During these big years Saw-whet Owls are perhaps our most common owl in the fall and early winter.

In conclusion, this research project brings valuable information to the study of owl migration. Our research has shown that migrating owls pass through this area in varying numbers, where no one has observed them in the past. We have been able to capture, band, and observe 771 owls of seven species while comparing the movements with the varying weather conditions. The data to date are summarized in the table on page 101.

When this project began, there were three sites banding Saw-whet Owls along the Atlantic Coast, and now there are more than twenty. This project has answered some questions but generated many more. Since the project began in 1994, we have observed Long-eared Owls at Daniel Webster Sanctuary every fall and occasionally in the Blue Hills and even Peaceful Meadows. It makes you wonder, how common are Long-eared Owls? How frequently do Boreal Owls visit Massachusetts? Little is known about our elusive owl species, but then these are thoughts for a future project.

Danielle Smith's *fascination with Saw-whet Owls was the initiating factor for this study, which was a four-year science fair project for the honors biology course at Whitman-Hanson Regional High School. After competing in the South Shore Science Fair, she was chosen to participate in the Massachusetts State Science Fair, held at MIT, where she placed second in the animal behavior category. Along with her brother Josh, she has assisted her father, Norman, in a long-running Snowy Owl banding and tracking project. Additional information and initial guidance for this project were obtained from David Brinker, Maryland Department of Natural Resources; Patricia Stanko, Braddock Bay Raptor Research, NY; and Katharine Duffy, Cape May Bird Observatory, NJ. She wishes to thank the Nuttall Ornithological Club's Charles Blake Fund for the continued support of this project.*