1

Radiotelemetry Study: River Otters Reintroduction at Letchworth State Park

Progress Report # 1

Prepared For:

New York Department of Environmental Conservation,

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Introduction

In 1995 the New York River Otter Project (NY-ROP) initiated a program to restore river otter (*Lutra* canadensis) populations to portions of western New York. As part of the restoration program, we have monitored 14 radio-implanted otters released along the Genesee River in Letchworth State Park (LSP) during Summer and Fall, 1997. The radio-telemetry study was designed to evaluate factors related to movement, home range development, habitat use, and food habits of the translocated otters. We are particularly interested in evaluating the influence of a flood control dam near the release site on otter movements and home range establishment. This report overviews the status of the 14 radio-equiped otters after the first year of the telemetry study.

Radio-telemetry

The 14 radio-equiped otters (eight males and six females) were released at "Lee's landing" along the Genesee River at LSP (Table 1). Trappers participating with the NY-ROP captured the otters from a large, native population in western New York. Otters were classified in three age categories, juvenile (<1 year old), yearling (1-2 years old), and adult (>2 years old) by participating veterinarians at Cornell. Each otter was equipped with an implantable transmitter (IMP-200; Telonics, Inc. Mesa, AZ) during a captive management period at Cornell. All transmitters were set at unique frequency within a range between 164 -165 Mhz.

Table 1. Sex, weight, age and release date for the 14 river otters released at Lee's landing, Letchworth State Park, Summer and Fall 1997.

Animal	Sex	Weight (Kg)	Age	Release Date
M180	Male	7.0	Yearling	July 21
F220	Female	5.2	Juvenile	July 21
M590	Male	7.5	Adult	July 21
M688	Male	5.9	Yearling	July 21
M160	Male	8.3	Adult	October 4
M440	Male	7.0	Yearling	October 4
F530	Female	5.7	Juvenile	October 4
M710	Male	7.3	Adult	October 4
M730	Male	7.7	Adult	October 4
F790	Female	6.3	Yearling	October 4
F520	Female			November 21
F620	Female			November 21
M950	Male			November 24
F970	Female			November 24

Otters were initially located from a vehicle with a omnidirectional whip antenna and a TR-2 receiver with a scanner (Telonics, Inc. Mesa, AZ). When a signal was

detected, the specific location of the animal was determined using a "H" antenna and walking to the signal (homing). Triangulation was used to estimate locations where topography or other conditions limited opportunities for homing. Each location was plotted on a 1:24,000 scale topographic map. An otter's activity (active or inactive) was recorded for each location. An otter was considered active when changes in signal volume was detected during the first 60 seconds of monitoring. Date, time, activity, habitat and observations were recorded for each location. We attempt to locate otters systematically during a regular, 24 hr schedule on a daily basis. However, intensity of radio-telemetry varied with seasonal and accessibility to areas occupied by otters (Fig. 1). To date, 2138 radio-locations have been recorded among the 14 otters being monitored (Table 2).

Table 2. Seasonal radiolocations of translocated otters in southwestern New York, 1997-98.

Otter	Summer '97	Fall '97	Winter '98	Spring '98	Summer '98	Total
M160		35	13	30	45	123
M180	94	11	2	15	24	146
F220	10	19	29	6	32	96
M440		30	5	32	56	123
F520		14	34	67	48	163
F530		4	6	65	43	118
M590	98	57	31	12	19	217
F620		6	22	25	20	73
M688	107	68	15	55	41	286
M710		57	30			87
M730		95	53	14	13	175
F790		82	42			124
M950		30	60	29	50	199
F970		29	63	62	54	208
Total						2138

When otters could not be located by ground-based tracking, we used a single engine airplane equipped with an omnidirectional whip antenna attached on the right wing to "relocate" missing animals. Specific locations of "relocated" otters were determined by ground tracking immediately after the flight.

Dispersal and Movements

Dispersal is defined as the process by which an animal moves from its birth place to anoter locality. However, in our investigation, we will consider dispersal as the movements of otters following their release until they establish regular patterns of movements (establish a home range). All otters were released in groups at the same

location (Lee's landing). However, release dates differed from groups (Table 1). Release date and presence (or absence) of established otters, human activity during release, influence of the flood control dam on structure of riparian habitats, gender, age class, etc. are among factors that could influence movement patterns of newly released otters. We are evaluating these and other factors that may be influencing otter dispersal. The following summarizes movements of radio-equipped otters, but should not be interpreted to imply causalty.

The first four otters were released during Summer (JULY 21), left the Genesee River and primarily have occupied beaver ponds within the boundary of LSP. The next release (OCT 4) included six otters. Among these otters, 2 remained along the river and the others 4 moved beyond the boundaries of LSP by 20 days post-release where they have occupied a variety of palustrine and lacustrine wetlands. The other four animals left the boundaries of LSP in the following 20 days. The next release (two otters) occurred on NOV 24. One of these otters remained along the river within LSP but the others now occupy wetlands outside of the Park. The final release (two otters) occurred on NOV 24 and these otters along the river and were typically located together, within 1.0 km of the release site (Table 3).

Dispersal distances of otters following what appearing to have established regular patterns of movement ranged from 1.5 to 22.5 km, with an average of 10.0 km (straight line distance from release site to most distant activity center; Table 3). Female F790 moved the greatest distance from the release site - the otters was killed (MAR '98) by a car along a highway approximately 37 km north of the rlease site. Prior to being killed, F790 occupied a beaver pond, within 5.5 km from the release site for most of winter (Table 3).

Table 3. Straight distance (km) traveled by the translocated otters from the release site to the farthest activity center.

Otter	Distance
160	9.5
180	8.0
220	22.5
440	9.5
520	5.5
530	10.5
590	22.5
620	8.0
688	10.5
710	16.5
730	8.5
790	5.5[a]
950	1.5
970	1.5

[a] The otter was killed by a car 37.0 km north from the release site.

Although features associated with the Genesee River at the rlease site - topographical features (i.e., waterfalls and steep gorges) and a flood control dam - may have prevented otters from initially leaving the river many had traveled beyond LSP boundaries within 20 days post-release. Several otters that initially occupied the river extended period subsequentely moved to wetlands within and outside LSP. By the end of SEP '98, only a single otter (F620) was regularly occupying the river. We suspect that disturbance of riparian habitats associated with flooding caused by the dam may be an important factor contributing to infrequent use of the river by otters. Hopefully, comparison of otter habitat use by between otters released in LSP and another group (eight radio-equipped otters) released south of LSP (an area not impacted by the dam) during Fall '98 will provide insight regarding influence of flood control dams on otter use of riverine habitats.

Habitat use

We categorized wetland habitats used by otters and summarized habitat use by season. Habitat use varied during periods until otters "settled" into establish patterns of movements. Otters frequently occupied wetlands associated with beaver activity. Other areas occupied by otters included riparian wetlands associated with the riverine system, palustrine wetlands, and man-made ponds.

Otters have occupied a variety of habitats sourrounded by areas altered by human activity (corn fields, dairy farms, housing developments). For example, three otters, F520, F530, and M710, used man made ponds during the winter. Interestingly, these ponds were tipically located in agricultural areas and offered almost no riparian cover. The area occupied by F520, was centered in sheep farm near LSP. Many palustrine wetlands occupied otters also occurred among human-dominated landscapes. Undoubtely, use of many of these habitats occurred as otters were searching for preferred areas and may not reflect important, long-term habitat. However, many of the palustrine wetlands (many created by beavers) used by otters in agricultural or otherwise human-influenced areas often have been occupied by otters for long periods.

Resting sites

We identified 49 resting sites used by otters (Table 5). Most resting sites were active or abandoned beaver lodges (53%) and beaver bank dens (29%). The use of beaver lodges and beaver bank dens as resting site reflects the frequent use of areas with beaver activity by otters. Throughout much of the study area beaver ponds appear to provide feeding sites, shelter, and refuge in areas outside the park that are dominated by human activity. Undoubtedly, some resting sites were not identified beacuse of inaccessibility.

Table 4. Habitat type used by translocated otters in southwestern New York, Summer 1997-Summer 1998.

Habitat Type	Summer '97		Fall '97		Winter '98		Spring '98		Summer '98	
	No. of animals	Percent of total	No. of animals	Percent of total	No. of animals	Percent of total	No. of animals	Percent of total	No. of animals	Percent of total
Riverine (including backwaters)			5	42	6	46	2	17	1	8
Beaver ponds	3	100	5	42	3	23	7	58	6	50
Marshes			1	8	1	8	3	25	5	42
Man-made ponds			1	8	3	23				
Totals	3		12		13		12		12	

Table 5. Resting sites used by translocated otters in southwestern New York, Summer 1997- Summer 1998.

Resting Site	Quantity	Percent
Beaver lodge	26	53
Beaver bank den	14	29
Muskrat bank den	1	2
Logjam	4	8
Woodchuck den	2	4
Unidentified den	2	4
Total	49	100

Activity Patterns

We monitored activity patterns on a 24-hr schedule. Although this data has been analyzed on a cursory level, certain patterns appear to be emerging. For example, during Summer '97, otters were most active during the night, crepuscular hours, and mid-morning. In Fall '97, a peak of activity occurred during mid-morning (Fig. 2). In Winter '97-98, otters were most active during diurnal periods, from 0700 to 1800 (Fig. 3).

Mortality, Natality, and Mating

Survival among radio-equipped otters has been high. To date, two mortalities have occurred (14%). One female (F790) was killed by a car in MAR 1998, about 37.0 km north from the release site, and the transmitter from one male (M730) was found in a beaver pond about 5 km west of the release site on SEP 1998. M730 died of unknown causes and the transmitter was thought to have been removed from the carcass by scavengers - we located no evidence of the carcass.

We were unable to document evidence of reproduction. However, many of the adult females that may have been pregnant occupied areas where observation of young would have been difficult. Regardless, we have made a sustained effort to observe adult females and have not seen them accompanied by cubs. Necropsy of the female (F790) killed by a car was determined to have been pregnant with cubs.

During the spring and summer of 1998 three pairs of male-female otters (F530-M688, F220-M590, and F970-M950) were known to have occupied the same areas (sometimes occupying the same resting sites and travelling together). Consequently, there was opportunity for mating to have occurred.

Food habits

A total of 706 scats have been collected (Table 6). Scats were collected in different habitats used by otters, but principally in beaver ponds. Scats have been

washed, dried, and stored. However, we have not initiated analysis to determine food content.

Table 6. Numbers of scats collected in the area used by the translocated otters in southwestern New York, 1997-98.

Summer '97	Fall '97	Winter '98	Spring '98	Summer '98	Total
38	94	228	132	214	706

We are evaluating prey (fish) assemblages throughout the study area to determine food availability and evaluate hypothesis related to carnivore spacing and resource availability. A reference collection of scales and bones removed from sampled fish will be used to aid identifying fish remains in otter scats and in developing regression models (width of lateral line scale vs length of fish) to predict sizes of fishe eaten by otters. Surveys for frogs were conducted along beaver ponds to evaluate their seasonal availability and to determine if their presence is an important factor influencing otter use of beaver pond.

Ongoing and Future Data Analysis and Research

We will continue monitoring radio-equipped otters throughout 1999. Transmitter performance has been exceptional and some have functioned for approximately 16 months (manufacturer expectations for battery life - 10-12 months). Currently, we are in currently in contact with 13 of 14 "new" radio-equipped otters that were released during Fall '98 and 6 otters from the '97 group. Intensive (daily) monitoring will occurr through AUG '99. The first author (Manuel) will begin classes at Pennsylvania State University during Fall '99 and, after that time, will attempt to make weekly trips to LSP for monitoring. We are considering hiring a research assistant to continue full-time work monitoring through '99. However, that decision will be based on status of the otters by mid-summer and availability of funding.

Research will continue to focus on monitoring survival, habitat use, food habits, prey selection, evidence of reproduction, and spacing patterns. We are especially interested in evaluating the influence of the dam on otter spacing and habitat use. Among the 14 radio-equipped otters reintroduced during Fall '98, six were released in LSP and eight in an area outside of LSP not influenced by the flood control dam. Comparison of otter movement and spacing between the release sites is expected to enable us to formulate opinions regarding the management of otters along rivers influenced by flood control dams.

We plan to apply Geographical Information System to juxtapose otter locations with landscape features associated with release locations during Spring '99.

Summary

In 1997 we initiated a research project to evaluate fates, habitat use, and home range development of 14 radio-transmittered otters translocated along the Genesee River at Letchworth State Park in western New York. The Genesee River at Letchworth State Park flows for about 30 km through a steep canyon extending from a series of three waterfalls to a flood control dam. The flood control dam causes extreme seasonal variation in water levels along the river and has significantly altered the structure of riparian habitats. Consequently, we were interested in evaluating the manner in which otters would respond to this disturbance and thereby gain insight into the impact flood control dams may have in otter populations. Our preliminary results suggest that otters may limit use of riverine habitat influenced by flood control structures. Most reintroduced otters have traveled from the State Park to adjacent private lands and are occupying small beaver ponds, marshes, and farm ponds associated with first and second order streams. The infrequent use of Genesee River by otters and the manner in which they have become segregated among isolated wetlands raises concerns about the suitability of this area to support a viable otter population. Nonetheless, otter survival has been high (only 2 mortalities) and otters persist within the Genesee River drainage. There is also evidence that at least 3 pairs (male and female) of otters were in close proximity during the Spring '98 breeding season. We plan to evaluate this issue further during 1998-1999 by studying responses of additional radio-transmittered otters that will be released at the original reintroduction site and along sections of the river not impacted by the flood control dam.

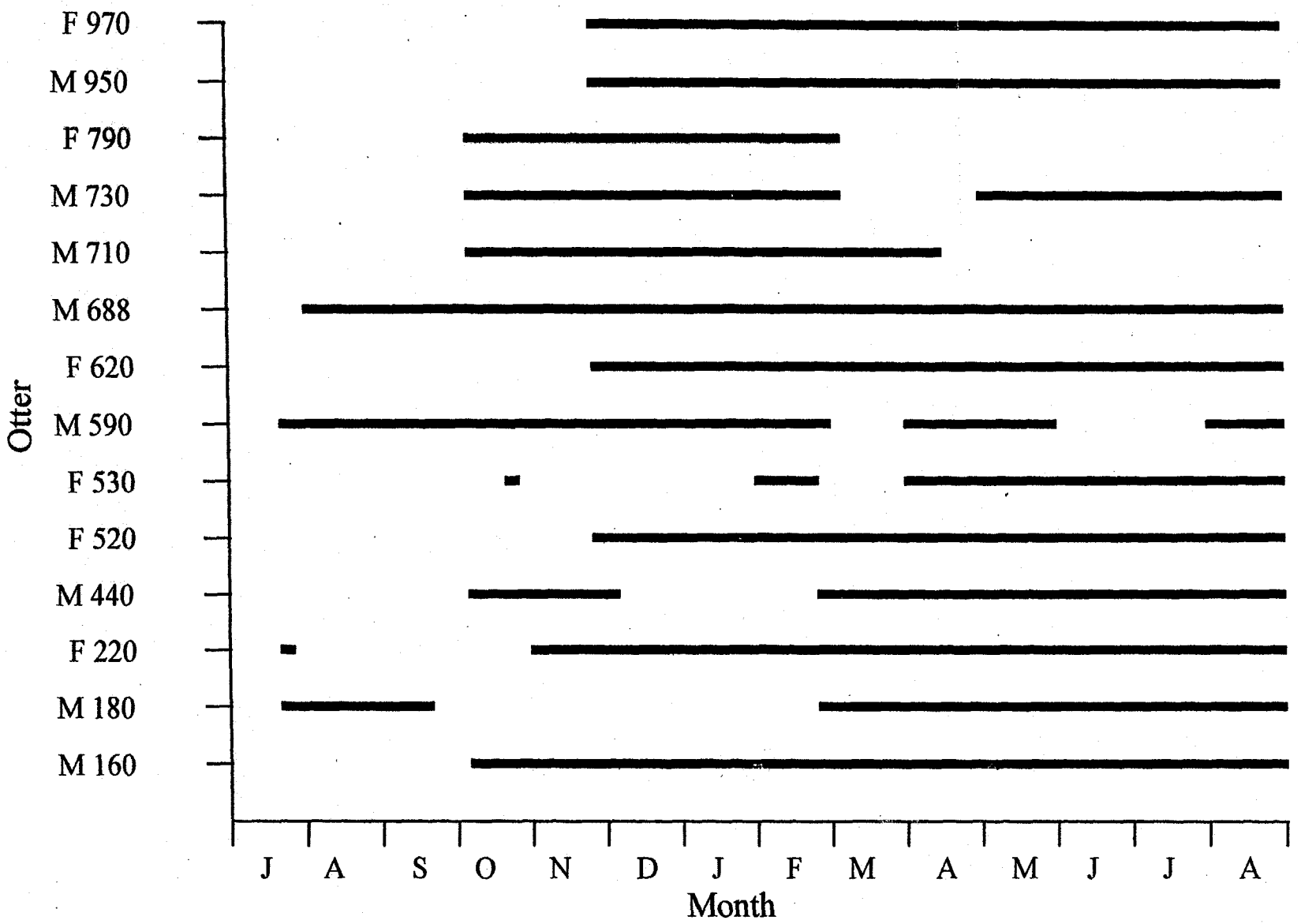

Fig. 1. Monitoring period for 14 translocated river otters released in Letchworth State Park, 1997.

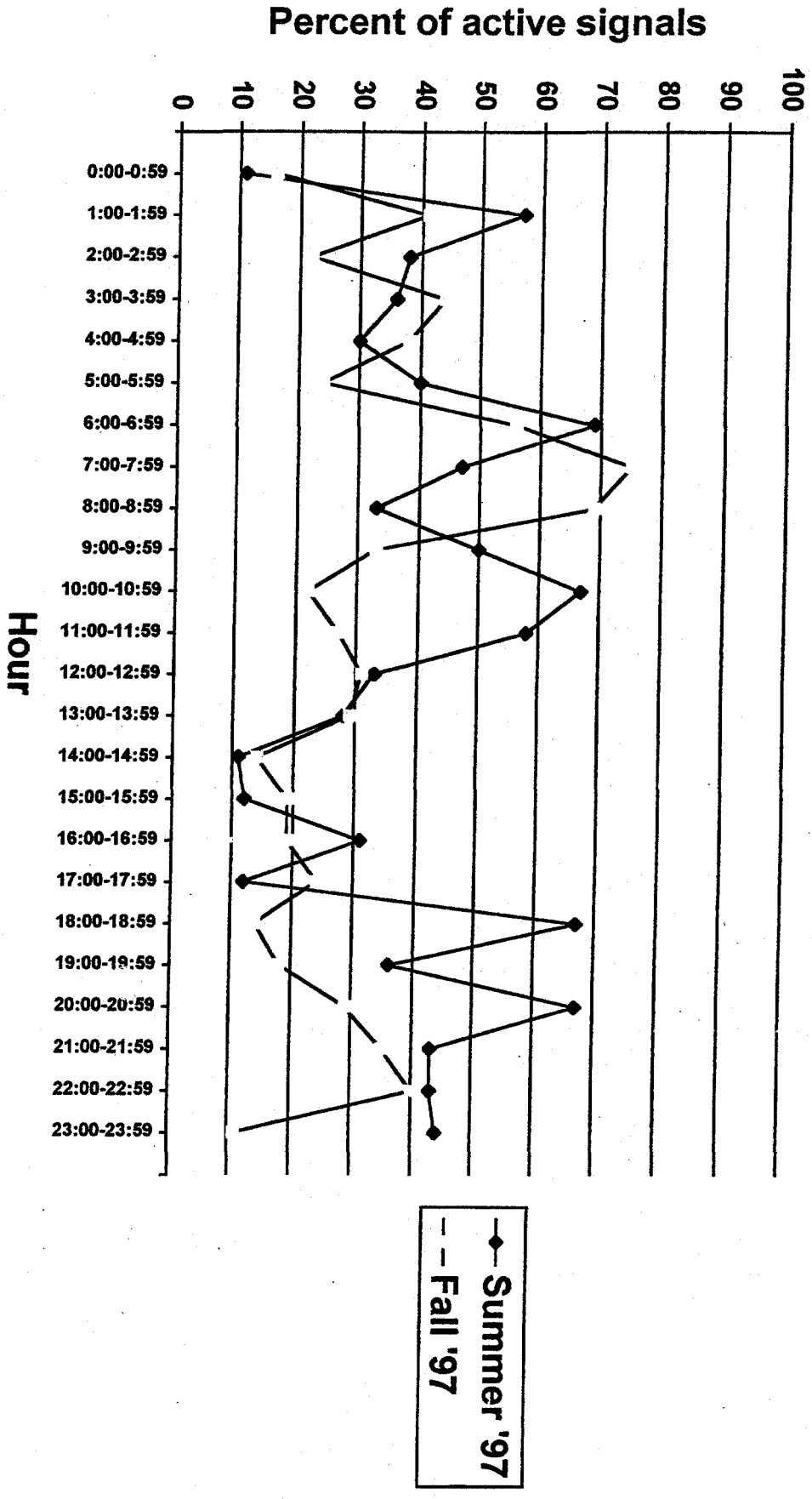

Fig. 2. Daily activity pattern of translocated river otters released in Letchworth State Park, Summer and Fall 1997.

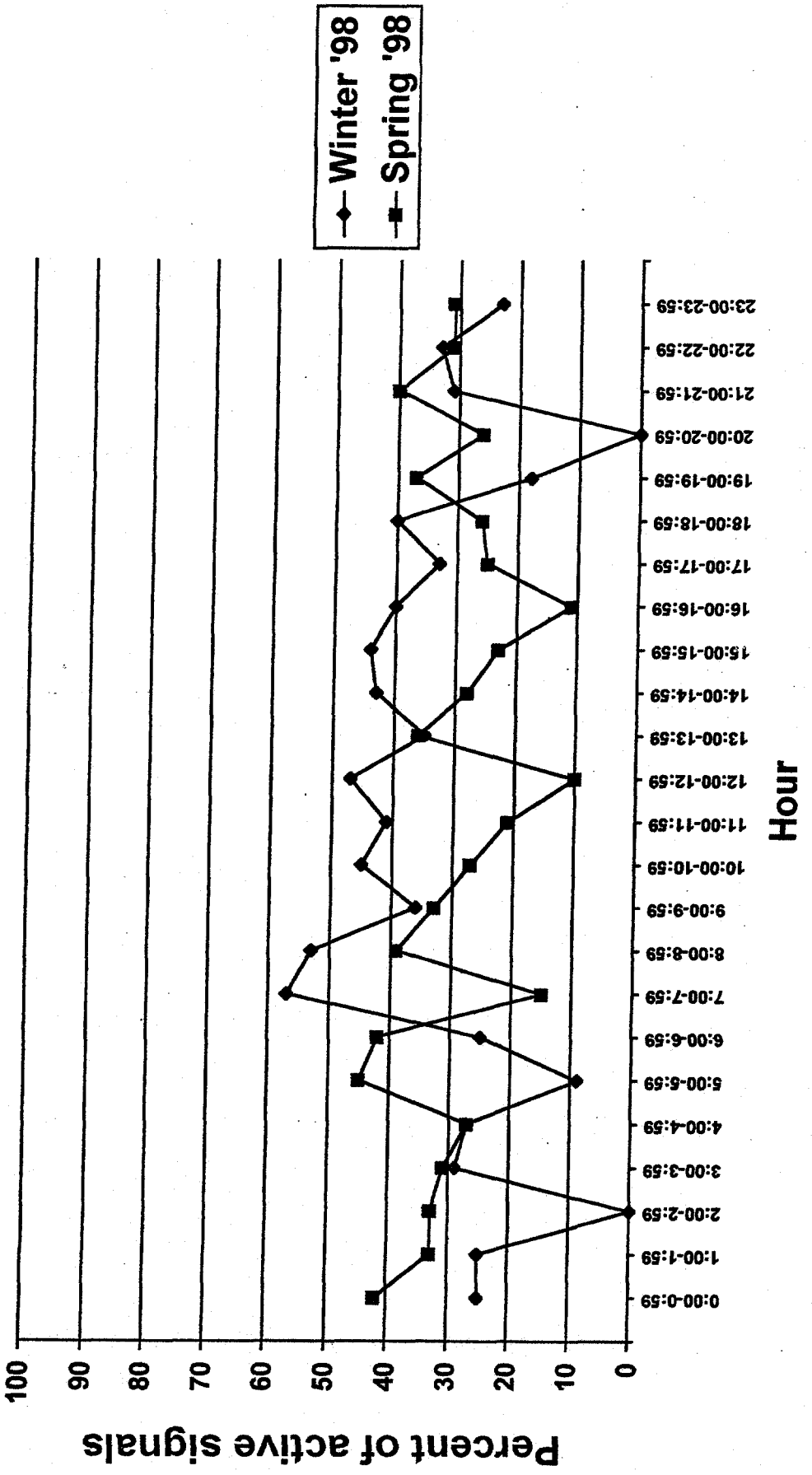

Fig. 3. Daily activity pattern of translocated river otters released in Letchworth State Park, Winter and Spring 1998.