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RIVER OTTER HABITAT USE IN NORTHWESTERN ILLINOIS

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ABSTRACT

Seasonal use of an area in northwestern Illinois by river otters was investigated October 1982 — June 1983. Seasonal fluctuations in use of features and habitat components were associated with Mississippi River stages, locations of suitable dens/resting sites, food availability, and distribution of open water in winter. Periodic flooding inundated dens and minimized sites suitable for denning, but provided an abundance of fish. The study area demonstrated promise of habitat manipulation as a management tool to enhance suitable habitats. Historic otter use was rare until a levee construction project resulted in unplanned, but effective improvements. Otter mobility must be considered in management planning. Populations in proximity to political boundaries require interstate collaboration for effective management.

INTRODUCTION

River otter (*Lutra canadensis*) populations are stable or increasing in portions of their historic range, but are rare or extirpated throughout much of the Midwest (Toweill and Tabor 1982). Otters have been protected in Illinois by a continuous closed season since 1929; they were listed as a "threatened" species in 1974 under provisions of the Illinois Endangered Species Protection Act of 1972. Current evidence indicates a sporadic occurrence throughout much of Illinois, but the major portion of the population occurs along the Mississippi River from the Wisconsin border to just north of Rock Island, IL (Anderson 1982).

Anderson and Woolf (1984) identified and characterized areas of "critical" otter habitat along and near the Mississippi from the Wisconsin border south to River Mile 246. An example of identified critical habitat was chosen to validate that designation

and determine seasonal use October 1982 — June 1983. This report summarizes findings from the latter objective.

STUDY AREA

A 220 ha area (Fig. 1) with 5 lakes immediately below Mississippi River Lock and Dam 13 north of Fulton in Whiteside County, IL was selected for intensive study. Prior to 1962, Lake 4 was a narrow ditch draining farmland to the east. The landowner excavated land bordering the ditch in 1962 creating the shallow (about 1 m or less) lake and the existing shoreline. In 1976, a 4 year project was begun to construct a levee through the area as part of a Mississippi River flood control project. Portions of Lakes 3, 4 and 5 were used as borrow pits creating present maximum lake depths of 4.3, 9.1 and 7.0 m for Lakes 3, 4 and 5, respectively. Lakes 1 and 2 remained shallow (maximum 1 m depths). Shallow water areas supported dense stands of emergent vegetation, primarily cattail (*Typha latifolia*) and smartweeds (*Polygonum* sp.).

The southern extension of the levee utilized an abandoned railroad bed as the foundation. Bordering mixed hardwood trees, some averaging more than 6 m in height, were cut and placed into large piles (8-12 m wide) along the lake shores (Fig. 1). The area is now predominately mixed lowland hardwoods, principally silver maples (*Acer saccharinum*) and scattered cottonwoods (*Populus deltoides*).

METHODS

Beginning 12 October 1982, frequent, and often daily searches were conducted along all riparian habitats to detect otter tracks, haul-outs, dens, scats, or other field signs. On occasions when complete searches were not made, previously used dens and haul-outs were visited to determine continuity of use. Use of an area was inferred from the presence of scats, tracks, and occupied dens. Scats were collected when found and their number and location used to estimate relative use of different portions of the area and to compare seasonal use of the 5 lakes, Johnson Creek and the Mississippi river shoreline.

Tracking in snow supplemented systematic searches of riparian areas. Otter footprints in snow and mud were measured in an attempt to classify sex and age (Stevens 1957) and determine minimum numbers of otters on the area at a point in time.

RESULTS

Fall Habitat Use

Several otters were using the study area in October 1982. Fresh scats were found at haul-outs located on log piles near Lake 4 (see Fig. 1); 1 otter was sighted. A fisherman sighted 3 otters, believed to be a family group, in late October. A minimum of 3 otters remained on the study area until 28 November when a juvenile male, probably of the family group, was accidentally caught by a trapper on Lake 3. Scat evidence (Table 1) indicated Lake 4 was the center of activity during October and November with over 75% of all scats collected there. Lakes 1, 3 and 5 received little use; other areas had no detected use.

Winter Habitat Use

Several otters continued to use the study area during winter. On 4 February, 1 solitary and 2 paired sets of tracks were observed. Measurements suggested the solitary set (9.8 cm rear track width) was likely that of an adult male, while the pair (8.2 and 7.3 cm rear track widths) probably represented a female and her pup. Presumably, this pair was the remainder of the family group that occupied the area in Fall. Otters frequently moved between the lakes, creek and river throughout winter. Dens were found in log piles on Lakes 3 and 4 and abandoned beaver (*Castor canadensis*) bank dens along Johnson Creek and Lakes 1 and 2.

Use of Lake 4, the most used area in Fall, declined sharply through December into January when only 2% of the scats occurred there. Notable increases in use of Lake 3 and Johnson Creek occurred during January, the occurrence of scats was 38% and 47%, respectively (Table 1). February activity on Johnson Creek declined to 8% while it increased to 48% on Lake 3. Otter activity on Lakes 1 and 2 (both shallow lakes) peaked in December at 34% frequency of scat occurrence, but remained at low levels (5% or less) during other winter months (Table 1). Winter activity on Lakes 3 and 4 (both deep lakes) was greater than all areas except Johnson Creek during January.

Spring Habitat Use

On 1 March, an adult male was live-trapped on the shore of Lake 3 (Anderson and Woolf 1984). Radio-telemetry revealed he left the area shortly after release on 4 March. Following a 10-12 cm snowfall in late March, 6 sets of otter tracks were observed; 1 solitary and groups of 2 and 3 individuals. The single otter was presumed an adult male (rear track width 9.5 cm); the group of 2 may have been the family present since Fall. The group of 3 consisted of similar sized otters based on rear track widths of 7.6, 8.2 and 8.2 cm. A male captured on 15 April (Anderson and Woolf 1984) left the study area shortly after radio implantation and release. These records indicate at least 7 otters used the area at some time during Spring.

The group of 2 utilized an abandoned beaver bank den along Johnson Creek. The 3 otters denned at 2 sites in log piles along the north shore of Lake 5. Tracking revealed the groups maintained spatial separation of den areas throughout most of April. During the same period, the solitary otter ranged throughout the study area. Decline in activity was noted in early April around the den site used by the pair, but continuous activity was noted at the other group's den sites until 6 May. After this date, tracks of only 1 otter were found.

Scat evidence (Table 1) supported track data indicating use peaked in March when 158 scats were collected. Otters mainly used Lakes 3-5 and Johnson Creek; Lake 4 had the highest monthly occurrence of scats (42%, Table 1). In April, activity was less concentrated as evidenced by increased use of Lakes 1 and 2 and a corresponding decreased use of Lakes 3-5. Use of Lakes 3 and 5 and Johnson Creek increased in May (Table 1). From March through May, the Mississippi River border of the study area received little use as evidenced by monthly scat occurrences of 2% or less.

Summer Habitat Use

Tracks indicated 1 otter remained on the study area in June; but, by 21 June, the last day of field surveys, no sign of otter activity was found. Scat data provided

similar evidence of declining use; only 16 were found. Tracking indicated the single otter wandered throughout the study area.

DISCUSSION

We are aware detection of scats may be biased by climatic, seasonal, behavioral, or other factors such as habitat characteristics. However, it is believed frequent, systematic searches for scats produced a valid indicator or seasonal intensity and shifts in use of components of the study area. Tracking during snow cover revealed little use of other than riparian areas except for travel between them. These data also substantiated seasonal shifts in use inferred from scats. It was not possible to determine absolute numbers of otters present at any one time; but, minimum numbers were derived and provided evidence of seasonal shifts in numbers of animals using the area. Choice of den sites and haul-outs were clearly evidenced by scats and use of different areas at different times suggested habitat features important to otters.

The log piles along Lakes 3-5 were key habitat components as evidenced by their frequent use as haul-outs and dens. Radio telemetry work in Idaho by Melquist et al. (1981) also revealed extensive otter utilization of log jams for denning and foraging. The importance of log piles, natural or man-made, seems more than a site specific characteristic.

An important characteristic of otter habitat associated with large rivers may be isolation from the main channel. The study area's isolation from the main channel of the Mississippi River resulted in less severe water level fluctuations and improved water clarity. During October and November, little use of Lakes 1 and 2, Johnson Creek, and the Mississippi River seemed associated with high water which caused a noticeable and negative impact on water clarity. Further, when high water inundated portions of these areas, secure den sites were restricted or eliminated. Melquist et al. (1981) noted that otter den site selection was related to food availability; suitable den sites were those close to foraging areas. Our findings reflect a similar importance of secure den sites as a component of quality otter habitat.

As ambient temperatures fell in January and February, the importance of open water became apparent and had the greatest influence on winter habitat selection. Foraging was evident only in open water areas. The total ice coverage of Lake 4 and the open water along Johnson Creek and on Lake 3 appeared to cause simultaneous decline of activity on Lake 4 and notable increases on Lake 3 and Johnson Creek during January (Table 1). Melquist and Hornocker (1983) also found streams with open water were preferred winter habitat; others have reported otters will travel some distance to reach open water (Erlinge 1967, Park 1971, Bottorff et al. 1976).

Open water alone may not make all portions of a stream suitable winter habitat. Although Johnson Creek remained open through much of winter 1983, use was evident only when other areas became ice covered. Johnson Creek is a rather sterile stream having primarily a sand/silt bottom and water depths of about 0.25 m along all but the lower 1.0 km. During both 1982 and 1983, otter use was concentrated in this latter portion.

Spring habitat selection appeared to be influenced by river stage and food availability. Levels in Spring were high, and for a period the study area within the levee system was inundated with few exceptions. The high water eliminated most suitable

den sites, including the log piles along Lake 3 and 4. As water levels increased, otters abandoned flooding dens.

Despite high river stages in March limiting den availability, use of the study area increased to its highest level. This likely was in response to food availability as indicated by haul-out locations. Large numbers of fish, especially carp (*Cyprinus carpio*), were observed passing through shallow, inundated areas adjoining the lakes and creeks. Otters were attracted to the supply of fish and selected dens and resting areas in close proximity. In Idaho, Melquist and Hornocker (1983) noted a similar concentration of otters around fish spawning areas. Further, they indicated although food had the greatest influence on habitat use, adequate nearby shelter was essential to promote extensive use.

During April and May as water levels dropped and the shallow inundated areas disappeared use declined. Most otters probably moved to nearby marshes and backwater sloughs not suitable during fall and spring high water, or during ice coverage in winter. Melquist and Hornocker (1983) believed mudflats, marshes and backwater sloughs were important summer habitats, especially to family groups.

MANAGEMENT IMPLICATIONS

The study area illustrated the feasibility of habitat manipulation to encourage otter use. Historic otter use was evident from records (Anderson 1982), but seemingly was sporadic and at a low level. Following completion of the levee in 1980, otters reportedly denned near Lake 3. Six were observed in October 1981, the most known over 30 years by the resident landowner (C. Jacobs, pers. comm.). We speculate increased use was due to unplanned, but effective habitat improvements as a consequence of levee construction. Deepening of Lakes 3-5 through dredging probably resulted in a larger, more diverse fish population; both commercial and recreational fishing support this contention. Proximity to the river allowed a natural restocking of fishes during high water. The deposition of trees removed during levee construction into log piles provided ideal dens and their placement in shallow water served as fish attractors and provided quality foraging sites.

Construction of levees around even small areas of potential habitat would improve conditions for otters and permit management of water levels. However, careful planning is needed to preclude or minimize damage to existing riparian habitats when implementing enhancement efforts.

However, habitat enhancement alone may not suffice to increase otter populations. Anderson (1982) and this study revealed use of an area was not consistent; individuals and groups moved frequently from areas that seemingly were meeting food and shelter needs. Clearly, mobility exceeded size of disconnected patches of suitable habitats. We presume otter populations of the upper Mississippi River and adjacent waters in Illinois are contiguous with, and may be augmented by those in Wisconsin. Populations in northeastern Iowa cannot be separated from those using Illinois habitats. Political boundaries must be ignored and populations managed with a large measure of interstate collaboration of effort and consensus of objectives.

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Table 1. Location, number, and frequency of occurrence to nearest percent of 765 river otter scats collected from the intensive study area north of Fulton, Illinois; October 1982 — June 1983.

	Fall		Winter			Spring			Summer
Location	October	November	December	January	February	March	April	May	June
Lake 1	8(13)[a]	0(0)	20(28)	0(0)	2(2)	0(0)	16(19)	6(17)	0(0)
Lake 2	0(0)	0(0)	4(6)	6(5)	3(3)	0(0)	14(17)	0(0)	0(0)
Lake 3	2(3)	10(11)	15(21)	48(38)	58(48)	38(24)	16(19)	9(25)	8(50)
Lake 4	54(84)	69(77)	19(27)	2(2)	35(29)	67(42)	17(20)	7(19)	0(0)
Lake 5	0(0)	11(12)	5(7)	0(0)	0(0)	27(17)	17(20)	10(28)	8(50)
Johnson Creek	0(0)	0(0)	8(11)	60(47)	9(8)	23(15)	3(4)	4(11)	0(0)
Mississippi River	0(0)	0(0)	0(0)	11(9)	13(11)	3(2)	0(0)	0(0)	0(0)
Totals	64(8)	90(12)	71(9)	127(17)	120(16)	158(21)	83(11)	36(5)	16(2)

[a]Number of scats (frequency of occurrence)

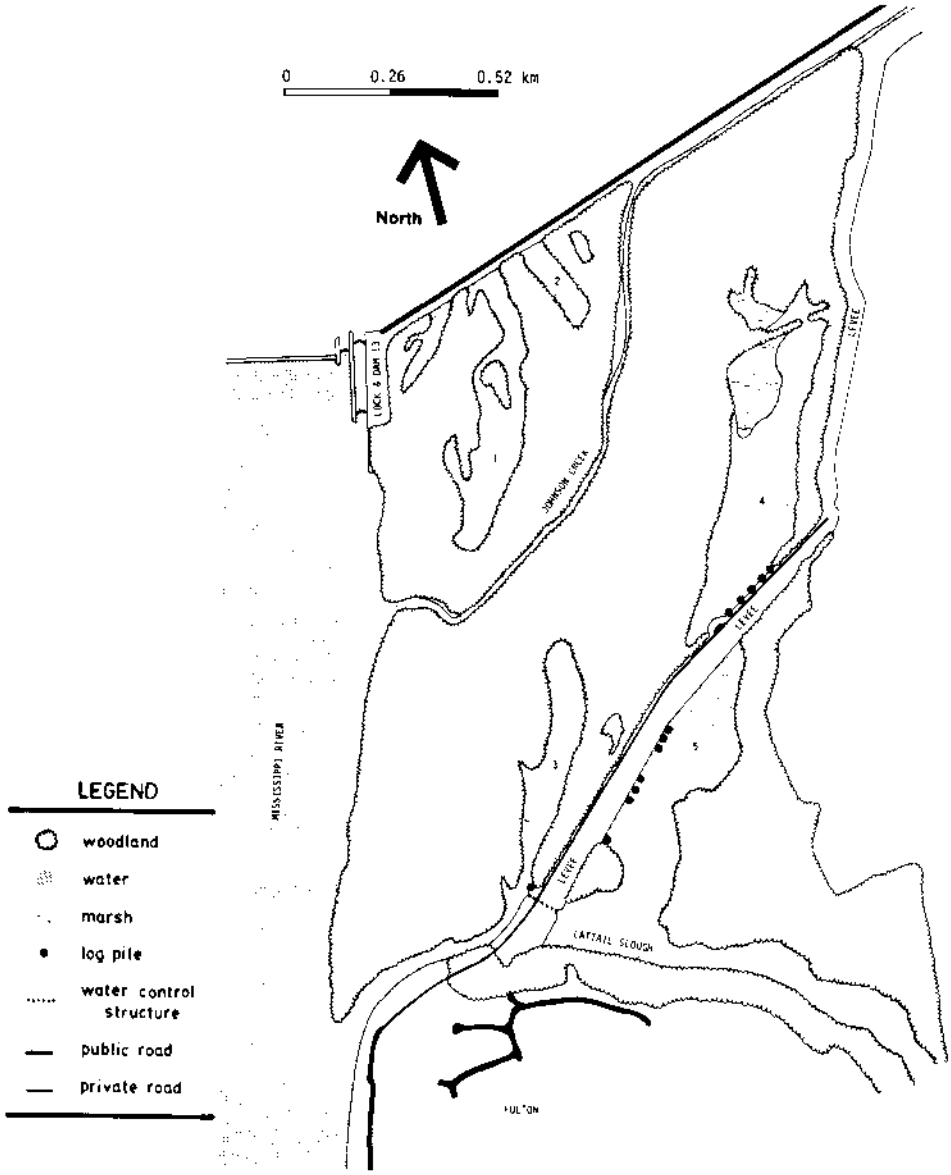

Fig. 1. River otter study area north of Fulton, Whiteside County, Illinois.