

CURRENT STATUS AND DISTRIBUTION OF THE SWAMP RABBIT IN ILLINOIS

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ABSTRACT

The swamp rabbit (*Sylvilagus aquaticus*) was studied in southern Illinois from October 1983 to May 1985 to determine distribution. Potential habitats identified using LUDA-GIRAS and high altitude infrared maps, cooperator reports, and historical documentations were searched to ascertain current status of swamp rabbits. Swamp rabbits inhabited at least 22 sites along Bay Creek, Big Muddy, Cache, Mississippi, and Ohio river drainages in Alexander, Franklin, Jackson, Johnson, Pope, Pulaski, and Union counties. Occupied habitat totals at least 12,485 ha; 4,795 ha are privately owned, 4,225 ha are federally owned, and 3,465 ha are state owned. Populations on private land must be considered vulnerable, but public land use is generally compatible with swamp rabbit needs. Management of public land is the most feasible option to insure perpetuity of swamp rabbits in Illinois. Status of swamp rabbits as game animals should be evaluated.

INTRODUCTION

Reports of swamp rabbits (*Sylvilagus aquaticus*) in Illinois indicate occurrence was largely in the "wooded bottoms of the Ohio and Mississippi rivers in southern Illinois" (Nelson 1909). Cory (1912) referenced Howell in describing the northern limit of its range in Illinois as a line extending from Grand Tower, Jackson County to 7.5 km south of Golconda in Pope County. Cochrum (1949) felt the range was expanding, adding Jackson, Perry, Jefferson, Hamilton, and Gallatin counties. Layne (1959) collected a specimen in Marion County, and believed there were reliable reports from Randolph County. Klimstra and Roseberry (1969) reported specimens from Wayne County and documented reports from Gallatin, Wabash, Lawrence,

Washington, Bond, and Calhoun counties as reliable. Terrel (1969) validated reports from Edwards, Wayne, and White counties, which he believed represented the North-most limits of the swamp rabbit in Illinois (Figure 1).

Historical reports suggest it once was widely distributed and fairly common in floodplain forests of the Cache, Big Muddy, Kaskaskia, Little Wabash, Saline, Wabash, Ohio, and Mississippi rivers. Recent evidence suggests it is less common than previously, and may be absent or nearly absent from most interior drainages.

Swamp rabbit habitat is characterized as wooded floodplains along borders of lakes, streams, and swamps (Chapman and Feldhamer 1981, Schwartz and Schwartz 1981). Rarely are they far from open water, although there is occasional utilization of upland sites as refuge from flood waters and for early season herbaceous vegetation (Seton 1953, Lowe 1958, Hunt 1959, Conaway et al. 1960). Swamp rabbits in Missouri were reported most abundant in lowland hardwood forests (Korte 1975). They were common in the formerly abundant canebrakes (Harrison and Hickie 1931) in Indiana, and generally associated with southern swamp forests (Terrel 1972). The conversion of bottomland forests to agriculture is responsible for population declines and restricted distribution. Graber and Graber (1976) estimated loss of Illinois bottomland oak-gum-cypress forests at 25 % and elm-ash-cottonwood forests at 35 % from 1962-1973. Missouri (Korte and Fredrickson 1977), Kentucky (Nelson 1974), and Indiana (Mumford and Whitaker 1982) experienced similar habitat losses and subsequent declines in swamp rabbit numbers and distribution. It is currently classified as rare in Missouri (Nordstrom et al. 1977), threatened in Kentucky (Branson et al. 1981) and is protected from hunting in Indiana (Jane Norris, Indiana Dept. Nat. Res., pers. comm.), but no special status has been granted in Illinois.

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METHODS

Historical distribution of the swamp rabbit in Illinois was determined through review of literature and various museum collections. Potential habitats for the current distribution study were identified using several methods. LUDA-CIRAS (Anderson et al. 1976, Mitchell et al. 1977) maps prepared by the IDOC (Peter Roberts, IDOC, pers. comm.) were used to identify forested wetlands in southern Illinois. Maps provided by the Illinois Natural History Survey were used to identify additional wet soil shrub-swamp types along the Cache and Big Muddy rivers. EROS (EROS Data Center, Sioux Falls, SD) high altitude infrared photographs were used to identify additional habitats along the Mississippi River from Alexander County to Jackson County. Additional potential habitats were identified using historical locations

checked on most recent 1:20,000 or 1:40,000 ASCS (Agricultural Stabilization and Conservation Service, Salt Lake City, UT) air photos.

Hunter-cooperators were recruited by announcements of the project placed in post offices, hardware stores, cafes, grocery stores, and other locations with high potential for encounter by hunters. Interested individuals were encouraged to call the CWRL, Southern Illinois University at Carbondale collect. They were interviewed to identify potential habitats.

Ground checks were conducted at habitats with high probability of supporting swamp rabbit populations. Presence and relative abundance were determined by observations of rabbits, pellets on logs (Terrel 1969), vegetation clippings, tracks, and other sign.

Detailed site information was documented (Kjolhaug 1986); subjective descriptions were made of relevant habitat features. Ownership of sites was determined from recent county plat books. Area size included contiguous bottomlands and any habitat within 200 m considered suitable, and was calculated using a dot grid (scale: 1.6 ha per dot). Area utilized was calculated as the entire contiguous area where rabbit sign was found in any part.

RESULTS

Distribution

Intensive searches for swamp rabbits or their sign were conducted in 11 counties with limited searches in 3 others; all but Saline had historical records. Sign was found in Alexander, Franklin, Jackson, Johnson, Massac, Pope, Pulaski, Union counties associated with Bay Creek, Big Muddy, Cache, Mississippi, and Ohio river drainages (Figure 2). Sign was not documented in Gallatin, Lawrence, Saline, Wabash, Wayne, and Williamson counties. Additional records since 1972 may include Clay, Gallatin, Jefferson, Wayne, and White counties (Mike Carter, IDOC, pers. comm.). Current distribution in Illinois is summarized in Figure 1. Although Bond, Calhoun, Edwards, Hamilton, Marion, Perry, and Randolph counties had historical records, they were not searched. The following summarizes search results in counties where their presence was confirmed.

Alexander County

Ten general areas were searched in Alexander County; 6 segments of Mississippi River floodplain forest comprising 2,295 ha, 3 Cache River bottomlands comprising 617 ha, and 82 ha of bottomlands along Clear Creek. Swamp rabbits were documented at all sites on the Mississippi and Cache rivers, but not along Clear Creek. Observations suggest nearly all suitable habitats were occupied along the Mississippi River from Burnham Island to Cairo, and along the Cache River from its confluence with the Ohio upriver to Tamms. Habitat along these areas was mostly continuous, but often limited to thin corridors along rivers and levees that connect larger blocks of bottomland forest.

Johnson County

Sites checked in Johnson County were concentrated in the southwest along the Cache River and in the southeast along Bay Creek. Swamp rabbits inhabit at least 750 ha in the Little Black Slough-Heron Pond area, and 410 ha in the Reevesville

and Grantsburg area. Although additional habitats of 820 ha along the Cache River appeared suitable, no sign was found.

Massac County

Site checks in Massac County were conducted at 10 locations along the Cache and Ohio Rivers, Bear Creek, and small adjacent tributaries. Total area occupied by rabbits was approximately 1,410 ha. Excluding Mermet Lake, all sites were small, sometimes connected by narrow strips of habitat, or narrow corridors along rivers. Areas lacking rabbits were smaller, isolated, and located on small tributary streams.

Union County

Four general areas searched in Union County included the Big Muddy-LaRue Swamp and Wolf Lake-Otter Pond areas, Union County Conservation Area, and the Mississippi River southwest of Ware. Swamp rabbits occurred on Union County Refuge and a small site near Wolf Lake, totalling 880 ha. The 800 ha site southwest of Ware was searched during flooding; no sign was found, but reports from local residents indicated occurrence is likely.

Pulaski County

Six areas totalling 700 ha in Pulaski County were searched; sign was found in 3 totalling 540 ha. Approximately 465 ha of bottomland and swamp forest along the Cache River between Alexander County and Interstate Highway 57 not searched may support swamp rabbits. All bottomlands were on floodplains of the Cache and Ohio rivers, or along small tributaries immediately adjacent. Most former forest was logged and converted to agriculture, and remaining areas were wet. Areas where rabbits occurred were greater than 100 ha; those lacking rabbits were less than 60 ha.

Franklin County

Fourteen sites totalling 5,270 ha were searched; 3 were occupied by swamp rabbits. Almost all was within the Big Muddy floodplain in the central Franklin county; approximately 1,500 ha were occupied by low densities. Continuous bottomland forest existed for nearly 35 km along the river, its forks and tributaries.

Other counties

Three areas totalling at least 4,550 ha were searched in Jackson county; sign was found only at Oakwood Bottoms. Three areas totalling 235 ha were searched in Pope County; sign was found in one 75 ha site along Bay Creek.

Total area and ownership of habitats

Total area of sites known to support swamp rabbits is 12,585 ha; approximately 4,795 ha are privately owned, 3,465 ha state owned, and 4,225 ha federally owned (USFS), of which 4,000 ha is the Oakwood Bottoms. An additional 1,898 ha of unsearched private land appeared suitable habitat, based on proximity to known populations, and size and vegetation composition of the areas.

DISCUSSION

A thorough study of swamp rabbit distribution in Illinois has never been conducted; historical documentation (Figure 1) based on a compilation of studies should be viewed with caution. It is likely recent reports (Cochrum 1949, Layne 1959, Klimstra and Roseberry 1969, and Terrel 1969) were not range extensions, but previously unreported populations. Habitat loss has occurred throughout the 1900's, with a corresponding decrease in swamp rabbit distribution (Terrel 1969, Korte and Fredrickson 1977). It is likely the most wide spread occurrence was prior to this period, but extent cannot be determined. Presumably, swamp rabbits once inhabited bottomlands along the Big Muddy, Cache, Little Wabash, Mississippi, Ohio, and Wabash rivers as far north as a line running east-west through Calhoun and Lawrence counties, with extreme southern counties most secure.

Based on CWRI searches, Alexander, Johnson, Massac, Pulaski, and Union counties support several secure, site-specific swamp rabbit populations. Sign in Franklin, Jackson, and Pope counties suggests low densities and limited distributions. The current status in seven counties with historical records not included in this study is unknown. Searches of Gallatin, Lawrence, Wabash, and Wayne counties conducted after spring flooding or when sites were covered with herbaceous vegetation yielded no sign (Kjolhaug 1986); however, subsequent study may reveal populations. Other recent records (Mike Carter, IDOC, pers. comm.) based on unsubstantiated reports must be viewed with caution.

The most significant disturbances to Illinois' swamp rabbit habitat are construction of levees, drainage ditches, and land-use conversion to agriculture. Most bottomland forests today are "islands" of habitat surrounded by agriculture, with little opportunity for reestablishment of extirpated populations; this is especially critical in northern portions of its range. The geographical distribution of any species is dynamic (MacArthur 1972), even in conditions of relative habitat stability. Statewide distribution of the swamp rabbit has probably always experienced advances and recessions over time, as expected for forms occupying marginal habitats or relatively severe climates at range extremities. Historically, continuous bottomland forest habitat throughout southern Illinois allowed reestablishment of northern swamp rabbit populations when extirpated from portions of the range. Fragmentation of habitats during the past 100 years had made repopulation by more secure southern populations less likely, and has created situations where barriers (agriculture fields, cities) limit dispersal into otherwise suitable habitats (Udvardy 1969). In addition, low survival or reproduction at range extremes may keep populations from reaching levels that encourage dispersal (Udvardy 1969, Sievart and Keith 1985).

Although federally owned land supporting swamp rabbit populations totals 4,225 ha, these are less significant than state and private holdings. Densities at the 4,000 ha Oakwood bottoms site are low and use is localized; the 1,360 ha area managed as a greentree reservoir is flooded (and unsuitable) from October through February. In addition, the 1,400 ha of plantation types are of limited value. The remainder of federal lands are small segments of occupied habitats where adjacent private and state lands are significant in maintenance of populations.

The state is the most important landholder of areas supporting swamp rabbit populations. Those of significance are in Alexander, Johnson, Massac and Union counties managed as refuges, parks, natural areas, and wildlife management areas.

All generally maintain habitat compatible with swamp rabbit needs, but there are no specific management efforts.

Many important habitats are in private ownership; most are owned by farmers, but are too wet to cultivate. Generally, all should be viewed as insecure; potential for destruction is based on changes in the farm economy and construction of water management projects. Commercially owned lands on the Big Muddy River are likely areas for habitat loss. The purchase of land by The LaSalle Bank and Trust Co. may be speculative in nature; future plans could include deforestation, farming, or energy development. Pressure on local politicians could encourage construction of ditches and levees, altering the hydrology of the area and allowing uses less compatible with swamp rabbit needs.

It is unlikely swamp rabbits in Illinois will recolonize vacant habitats; rather, they may continue to become extirpated from remaining "islands". This process will continue until they are limited to a few remaining habitats in public ownership and private conservation lands, or less suitable swamp habitat. Although the Illinois population is a relic, at least 22 sites still support swamp rabbits. Efforts should be initiated to assure survival of these local populations, and to identify additional populations. Selective cutting of over 7,500 ha of state and federal bottomland forests now supporting swamp rabbits should improve habitat quality (Kjolhaug 1986), encouraging higher population densities better able to survive relatively severe weather in Illinois. Notifying owners that their lands support swamp rabbits may provide incentive to preserve such areas.

Swamp rabbits are a game animal in Illinois; because of hunter identification problems, season lengths and bag limits are not distinguished from those for eastern cottontails. No estimates of swamp rabbit contribution to annual rabbit harvest is available; although undoubtedly small, any harvest must be viewed with caution. As a native species, Illinois must insure its perpetuity; identifying habitats supporting populations and providing full protection for the most important areas will be an important step. Preservation of a viable swamp rabbit population in Illinois will require an active effort.

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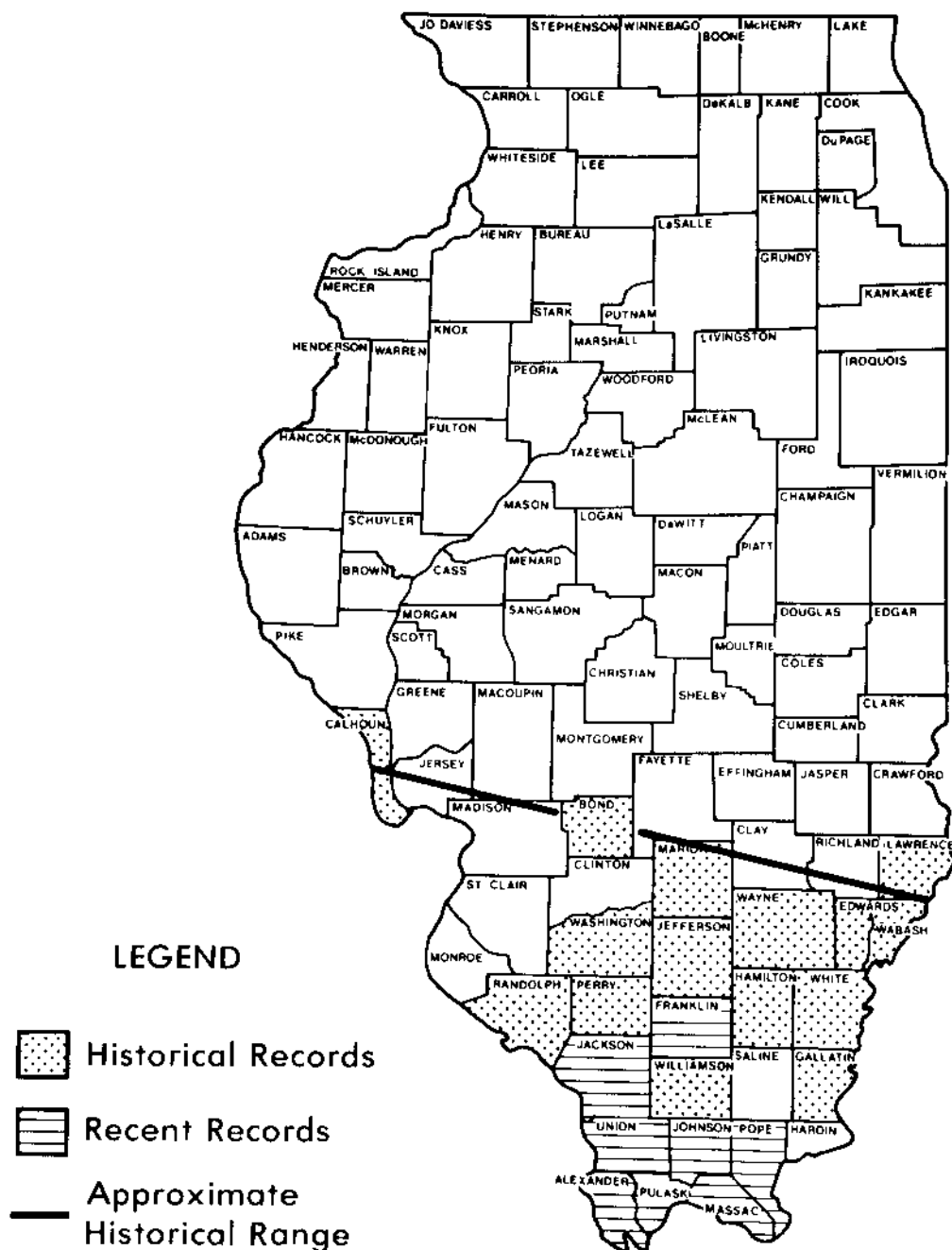


Fig. 1. Historical and recent swamp rabbit records in Illinois (recent represents 1984-85 study).

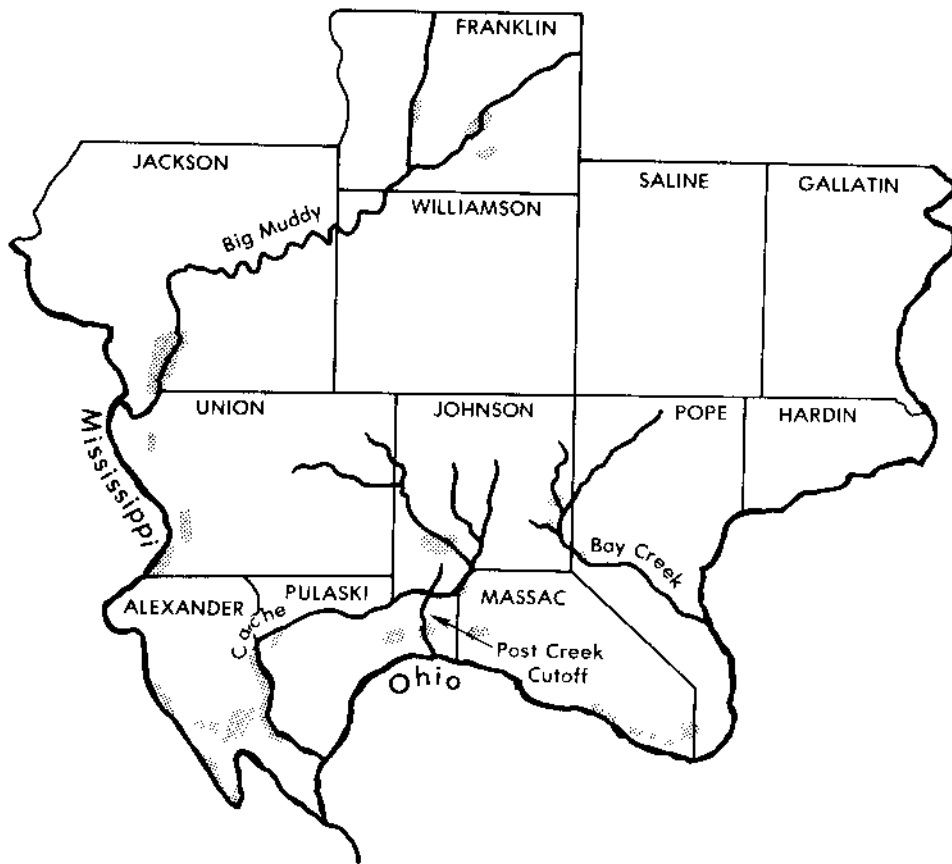


Fig. 2. Locations of habitats currently supporting swamp rabbit populations in Southern Illinois, 1984-85.