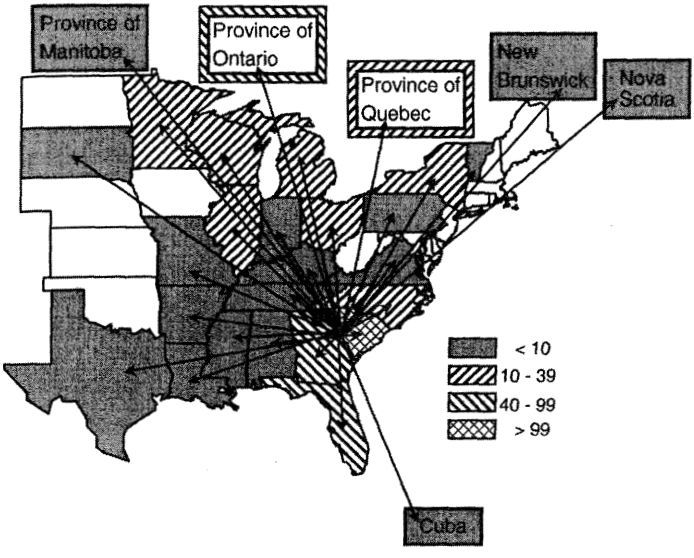

Figure 6.6. Hunter recovery locations in the eastern United States of 594 ring-necked ducks originally banded on the Savannah River Site, 1985–2002.

et al. 1989; Brisbin and Kennamer 2000). Much of this research has focused on radiocesium and mercury levels in waterfowl using Par Pond and Pond B.

Wild Turkey

William F. Moore, John C. Kilgo, William D. Carlisle, and Michael B. Caudell

Wild turkeys (*Meleagris gallopavo*) were once abundant throughout the Southeast, but unregulated hunting and habitat destruction greatly reduced populations to a few thousand birds by 1930 (Hurst and Dickson 1992). Through intensive restocking efforts beginning in the 1950s, protection from hunting, and reforestation, southeastern turkey populations have rebounded to an estimated one million birds (National Wild Turkey Federation 1986). Biologists once believed that wild turkey populations required large areas of remote, undisturbed forest (Mosby and Handley 1943; Hurst and Dickson 1992). However, over the years, turkeys have

proven adaptable to various types of habitats and now thrive in areas once thought only marginal (Little 1980).

SRS Population History

When the Savannah River Site (SRS) was established in 1951, wild turkeys were extremely rare on the site and were restricted to the Savannah River swamp (Jenkins and Provost 1964). A total of eight turkeys (mainly single birds) were observed from 1951 to 1961. In the early 1970s, the South Carolina Department of Natural Resources (SCDNR) reintroduced wild turkeys on SRS to establish a large source population for restocking other areas of the state. In the winters of 1973 and 1974, SCDNR trapped forty-eight turkeys in the western and central Piedmont of South Carolina and released them at four locations on the site. By 1977, SCDNR deemed the stocking effort a success, and that winter they began trapping SRS turkeys for translocation to other regions of South Carolina. Initial efforts in the original release areas during 1977 trapped only eight birds, but by the early to mid 1980s, trapping success began to increase (table 6.11). It declined again in the mid to late 1980s but was good from then until 2000, after which turkeys were no longer needed for restocking other areas. From 1991 to 2000, the number of wild turkeys trapped annually on SRS for restocking purposes ranged from 31 to 108 and averaged 58.

Turkeys have not been hunted on SRS since the Site was established in 1951. However, in the western portion of SRS, Crackerneck Wildlife Management Area and Ecological Reserve (CWMA) allows spring gobbler-only hunting. Since CWMA opened for hunting in 1983, the annual harvest has ranged from one to forty-three (table 6.12). Until 1992, annual harvest was well below the long-term average of thirteen birds. However, from 1993 to 2002, an average of twenty-two turkeys were killed each year.

The CWMA harvest data and SRS trapping success data, combined with data from annual wild turkey summer brood surveys conducted by SCDNR, indicate that the SRS turkey population increased between 1993 and 2003 (figure 6.7). From 1974 to 1992, an average of 68 adult turkeys and 77 poults were seen each year, whereas an average of 451 adults and 308 poults were observed annually from 1993 to 2003. The current estimated population size on SRS is 2,000 to 2,200 birds and appears to be stable or increasing. Turkeys now occupy all portions of the site, with greatest densities in portions adjacent to the Savannah River swamp.

Table 6.11 Number of turkeys trapped on the Savannah River Site by the South Carolina Department of Natural Resources for off-site restocking programs, 1978–2000

Year	Hens	Gobblers	Total
1978	0	8	8
1979	6	6	12
1980	0	6	6
1981	6	5	11
1982	0	0	0
1983	19	33	52
1984	38	36	74
1985	11	12	23
1986	8	4	12
1987	0	0	0
1988	0	0	0
1989	22	9	31
1990	0	8	8
1991	9	33	42
1992	66	38	104
1993	28	11	39
1994	39	43	82
1995	12	19	31
1996	50	17	67
1997	92	16	108
1998	32	4	36
1999	0	28	28
2000	25	18	43
Total	467	362	829

Population Influences

Moore et al. (2002) reported survival rates for 102 radio-instrumented turkeys monitored for three years on SRS. Annual survival rates of hens (0.60) and gobblers (0.71) do not differ significantly. Most mortality for both sexes occurs during spring and early summer, when gobblers are preoccupied with breeding and hens are nesting. The primary predators of both gobblers and hens on SRS are bobcats and coyotes (table 6.13). Other potential predators include gray fox, hawks, feral dogs, and owls. Roadkills accounted for 8 percent of the mortalities of radio-instrumented turkeys. For gobblers in the CWMA population, hunting is also a significant mortality source. The annual survival rate of CWMA gobblers (0.55)

Table 6.12 Wild turkey harvest data recorded on Crackerneck Wildlife Management Area and Ecological Reserve, 1983–2003

Year	Gobblers	Jakes	Total
1983[a]	0	1	1
1984	3	0	3
1985[b]	0	2	2
1986[c]	1	1	2
1987	4	0	4
1988	4	0	4
1989	5	0	5
1990	4	0	4
1991	2	2	4
1992	4	4	8
1993	10	0	11[d]
1994	2	4	6
1995	14	8	22
1996	10	5	15
1997	11	4	15
1998	17	2	19
1999	24	8	32
2000	15	3	18
2001	27	3	35
2002	19	8	43
2003[e]	6	0	6

[a] Initial year of hunting, with season from April 1 to May 1.
[b] Three-day season.
[c] Expanded to half-day hunts on Fridays and Saturdays April 1–April 30.
[d] Includes an illegally harvested hen with no beard.
[e] Season was shortened due to elevated security concerns on SRS.

is significantly lower than that of gobblers in the unhunted SRS population (0.71).

Nesting success of hens varies greatly on SRS from year to year. In 1998, 92 percent of radio-marked hens nested successfully; ten of the thirteen hens that attempted nesting hatched broods successfully on their first attempt, and two others were successful on their second attempt (Moore et al. 2002). Accordingly, the number of poults observed during the SCDNR sitewide summer brood survey that year was among the highest on record for SRS (figure 6.7). In contrast, nesting success of radio-marked hens in 1999 and 2000 was extremely poor; of seventeen

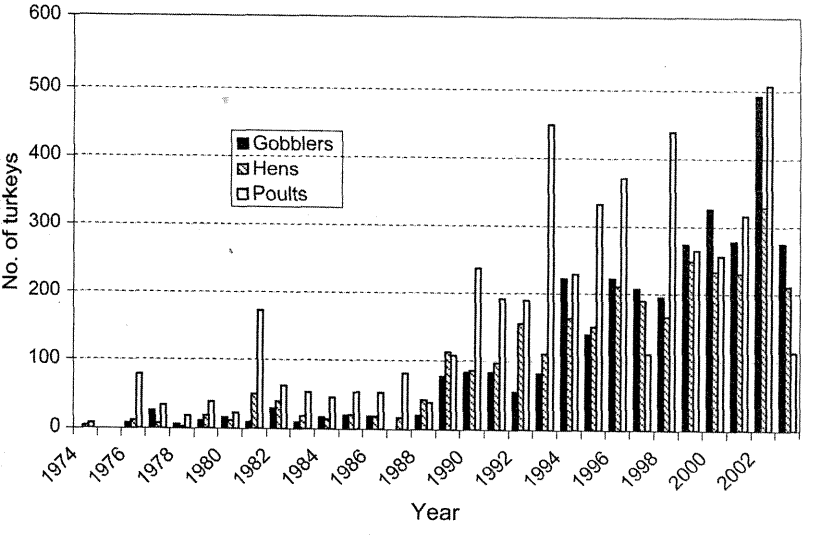

Figure 6.7. Wild turkey observations recorded during South Carolina Department of Natural Resources summer brood surveys 1974–2003 on the Savannah River Site (S.C. Dep. Nat. Resources, unpublished data).

Table 6.13 Causes of mortality (number and percent) among 132 radio-instrumented wild turkeys on the Savannah River Site and the Crackerneck Wildlife Management Area and Ecological Reserve (CWMA), 1998–2001

		Gobblers		
Cause	Hens	SRS (unhunted)	CWMA (hunted)	Total
Bobcat predation	9 (41%)	11 (61%)	5 (42%)	25 (48%)
Coyote predation	2 (9%)	0	0	2 (4%)
Unknown predator	9 (41%)	5 (28%)	2 (17%)	16 (31%)
Harvest	0	0	5 (42%)	5 (10%)
Road kill	2 (9%)	2 (11%)	0	4 (8%)
Total	22	18	12	52

Source: Moore et al. 2002, J. C. Kilgo, U.S. Forest Service, unpublished data.

hens that attempted nesting, only one successfully hatched a brood (Moore et al. 2002). In addition to an extremely high nest predation rate of 81 percent over the two years, most radio-marked hens in 1999 (fourteen of fifteen) either did not attempt to nest or their nests were depredated during the laying period (before researchers located them). None of the fourteen renested. Although the summer brood surveys indicate

that nesting success was not as poor in the general population as among the radio-marked hens, approximately 40 percent fewer poults were observed in those years than in 1998 (figure 6.7). Nesting success of radio-marked hens was only slightly better in 2001, when three of ten hens (30 percent) were successful (Carlisle 2003). The summer brood surveys reflected this slight increase in productivity. Over the four years of study, nesting success was 40 percent. Nest predators on SRS include raccoons, opossums, and snakes. Clutch sizes of first nesting attempts averaged eleven eggs during all years, while renests averaged eight eggs.

To evaluate the effect on turkeys of prescribed burning during the growing season, Moore et al. (2002) and Carlisle (2003) monitored twenty-two hens on a portion of the SRS subjected to growing-season prescribed fire on a three-to-five-year frequency. Only two hens (9 percent) had nests destroyed by prescribed burns. One of the hens attempted to renest, but her second attempt was depredated. Given the small sample, the impact on productivity remains unclear, but it appears that the SRS turkey population is minimally affected, especially considering the limited area currently burned during the growing season (less than 1,000 ha, or 2,471 ac; see chapter 3). The wide variety of habitats selected for nesting (see below) further limits nest exposure to fire, as most growing-season burning is in mature pine stands. The percent cover of preferred turkey food plants was similar in stands burned during growing and dormant seasons (W. F. Moore, unpublished data), perhaps due to the fact that the areas sampled had only recently come under a growing-season burning regime. Long-term use of growing-season burning may enhance development of more typical fire-maintained herbaceous communities, which may provide greater benefit to turkeys.

Habitat Use

Throughout most of the wild turkey's range, hardwoods are an essential habitat component, particularly during the winter months, when hardwood mast is their primary food source. In the Southeast, many studies have shown that areas dominated by hardwoods are the preferred winter habitat for turkeys (Everett, Speake, and Maddox 1979; Kennamer, Gwaltney, and Sims 1980; Everett, Speake, and Maddox 1985; Smith and Teitelbaum 1986; Hurst and Dickson 1992). Providing such areas for winter habitat helps maintain a year-round wild turkey population (Hurst and Dickson 1992).

Though turkey populations seem to be highest in areas with extensive stands of mature hardwoods, turkeys can exist in areas dominated by pine plantations when plantations are relatively small (about 40 ha, or 100 ac) and the ages of adjacent stands are diverse (Hurst and Dickson 1992). Some mature hardwoods are needed for roosting habitat and for mast production during winter. Openings or early-successional areas are required for brood habitat. Turkey habitat in pine plantations is greatly improved when burned on a three-to-five-year cycle and thinned frequently (Hurst and Dickson 1992). Turkeys are apparently adaptable to many types of small-scale forest disturbances.

Wild turkeys on SRS use a wide variety of upland and bottomland habitats throughout the year. During spring and summer, they exhibit few habitat preferences (W. F. Moore, unpublished data), although they—especially hens with broods—forage extensively for insects in herbaceous areas such as grassy rights-of-way. However, during fall and winter, turkeys prefer hardwood habitats, including upland, bottomland, and mixed pine-hardwoods (W. F. Moore, unpublished data), where they forage for mast. Year-round, roosting sites tend to be in hardwood forests near a water source, such as a creek or pond.

Hens nest in virtually every habitat on SRS, including pine stands of all ages, upland hardwoods, bottomland hardwoods, mixed pine-hardwoods, blackberry thickets, and power line rights-of-way (Moore et al. 2002). Vegetation around monitored nest sites from 1998 to 2000 varied widely in species composition and density, and there were few similarities among nest sites. However, 95 percent of monitored nests were located less than 100 m (328 ft) from a road or firebreak. Hens may nest near roads so they can more easily lead poults to herbaceous feeding areas after hatching.

Home Range and Movements

Home range sizes of turkeys on SRS average approximately 728 ha (1,800 ac) for gobblers and 526 ha (1,300 ac) for hens (Moore et al. 2002). Weekly movements of gobblers are greater in late winter and early spring, during the breeding season, while movements of hens are usually greater during late spring and early summer, when they are searching for nest sites.

Several monitored hens on SRS moved great distances (more than 6.4 km, or 4 mi) in a few days. Gobblers captured and banded on SRS have been harvested by hunters on private property up to 19 km (12 mi) from

their capture sites. Many of these movements are temporary. For example, hens occasionally moved outside their home ranges to nest or for other unknown reasons but eventually returned to their home range. Some turkeys, however, made long-distance dispersal movements and established new home ranges. Thus, although trapping by SCDNR for its restocking program has not been needed since 2000, SRS continues to be a source of turkeys, if only for the local area.

Furbearers

John J. Mayer, Lynn D. Wike, and Michael B. Caudell

Furbearers are mammals with marketable pelts that represent a potential economic resource. Several regionally significant furbearers occur on the Savannah River Site (SRS). In spite of their economic importance, these species have not been commercially harvested on SRS since its establishment. Since 1954, researchers have studied several individual furbearer species on SRS. In addition, two long-term surveys of SRS furbearer numbers have been conducted: the Small Furbearer Survey, by the University of Georgia and the Savannah River Ecology Laboratory from 1954 to 1982; and the Furbearer Scent Station Survey, by the South Carolina Department of Natural Resources (SCDNR) from 1984 through the present.

Furbearers on SRS historically include Virginia opossum (see table 4.24 for scientific names), beaver, muskrat, coyote, red fox, gray fox, raccoon, long-tailed weasel, mink, eastern spotted skunk, striped skunk, river otter, and bobcat. All species except the coyote were present when the government acquired the property. The following individual species accounts discuss current population levels, factors controlling distribution on SRS, and the historical population trends and environmental impacts of each of these species.

Virginia Opossum

The Virginia opossum is the only marsupial native to North America. This species has continued to gradually expand its range northward and has been introduced on the west coast of the United States. The opossum pelt is of low quality but is an abundant item in fur markets. This species uses a wide variety of habitats and is common throughout the SRS (Cothran et al. 1991). Jenkins and Provost (1964) stated that the opos-