



Above: Jim Evans, Tennessee Wildlife Resources Agency manager, identifies bird species on the Oak Ridge Reservation's Freels Bend area of the Three Bend Scenic and Wildlife Refuge. Participants in public walks may see as many as 60 different bird species in a single morning.

Oak Ridge National Laboratory

There have been tremendous changes in the landscape of east Tennessee over the last 58 years. However, biological riches from past landscapes have survived and flourished, protected within the boundaries of the Department of Energy's 34,500-acre Oak Ridge Reservation. What was once common has become uncommon ground.

The story of the federal reservation at Oak Ridge begins with World War II - in 1942 as part of the wartime "Manhattan Project," the U.S. Army purchased land along the Clinch River between Kingston and Clinton. The area was rapidly converted into heavily guarded, secret facilities that would contribute to the development of the atomic bomb.

These facilities were encircled by a no-man's land of abandoned homes, fields and forest. The secrecy associated with the Manhattan Project allowed these abandoned lands to escape urbanization that affected the surrounding region and

to mature into a unique ecological treasure.

This unplanned conservation has provided opportunity for the preservation of many rare species and communities that have disappeared elsewhere in east Tennessee.

"This island of undisturbed and recovering ecosystems in a sea of disturbed habitats has social and ecological values that increase exponentially with each passing day. (These are) values which far outweigh the simple monetary value to be gained from the sale of the land for just one more industrial, commercial or residential development in the name of progress," says Dr. Ed Clebsch, regional ecologist and University of Tennessee botany professor emeritus.

Indeed, this "island" boasts over 1,100 plant species, with 21 considered rare enough to be in need of conservation.

A 1995 biodiversity review of the reservation by The Nature Conservancy identified rare plants in more than 270 locations on the reservation. The Nature

Conservancy ranked 81 sites as having very high or high significance for conservation and recommended protecting conservation sites based on clusters of rare plants and communities. They recommended long-term protection of three large blocks of land to preserve the integrity of these significant areas.

As a result of The Nature



Oak Ridge National Laboratory

Uncommon Ground:

THE OAK RIDGE RESERVATION

By Pat Parr, Linda Mann and Brian Bowen



Above: Tall Larkspur, listed as globally rare and by the state as endangered, is located in the McCoy Branch Embayment State Natural Area on the Oak Ridge Reservation.

Conservancy report, the Tennessee Natural Areas Program is currently preparing a proposal to the Department of Energy at Oak Ridge to expand the State Natural Areas on the reservation (seven were registered in 1984). Plans are to recommend that several areas ranking high in conservation significance be registered as State Natural Areas and that these sites be

managed and protected as valuable conservation resources into the future.

These areas of conservation significance have matured from a larger landscape that was originally identical to its surroundings. In 1942, about half of the reservation had been cleared for crops and pasture. Forests have gradually replaced most of the cleared agricultural

land through natural succession or planted tree seedlings.

Although oak-hickory and pine constitute the most common forests, there are many less common ecological communities that support rare plant populations. These communities include cedar glades and barrens, forested river bluffs, cove hardwood forests and wetlands.

Cedar glades and barrens are fairly common on the reservation and occur as small, drought-prone openings along exposed limestone in the surrounding forest. In one of these sites, the rare Tall Larkspur (*Delphinium exaltatum*) is abundant and the site may contain one of the world's largest populations of this species.

River bluffs are also fairly common along the south and southeast boundaries of the reservation. This rugged environment has important plant communities that are home for several rare plant species such as Appalachian Bugbane (*Cimicifuga rubifolia*) and Spreading False Foxglove (*Aureolaria patula*). A rare Northern White Cedar (*Thuja occidentalis*)

Left: Wheat cutting time on the Anderson farm, located in Bethel Vaffey, which later became part of the Oak Ridge Reservation during the World War II's Manhattan Project. Right: Arthur and Helen Walker and their grandchildren, Oliver and Mary Anderson, around 1925 on land in Bethel Valley, later acquired as part of the Oak Ridge Reservation during the World War II Manhattan Project.



Oak Ridge National Laboratory



Oak Ridge National Laboratory

Above left: Students investigate, collect data and interpret results in the Fallen Tree class at the Oak Ridge National Laboratory's Ecological and Physical Study Center. **Center:** The New Zion Forested Wetland, a headwater forested seep, is representative of one of the many types of 500-plus acres of forested wetland on the Oak Ridge Reservation. **Right:** Dr. Michael Gebre, an Oak Ridge National Laboratory researcher, collects data at Walker Branch Watershed research site. Long-term data is providing information on potential impact of global climate change on forests.



Oak Ridge National Laboratory



Right: The Grasshopper Sparrow nests in the open field areas of the Three Bend Scenic and Wildlife Refuge on the Oak Ridge Reservation. It is recognized by the state as a species in need of management.



Oak Ridge National Laboratory

woodland community also overlooks the Melton Hill reservoir from shaly cliffs.

Perhaps the largest refuge for rare plants on the reservation are the almost 600 acres of wetlands. Other than embayments of the river reservoirs, wetlands have become increasingly uncommon in the region. In embayments, mundane species such as sedges, smartweeds, and cattails thrive. But the reservation also harbors ponds, floodplain pools, boggy forested wetlands, wet meadows, open marshes, and woodland seeps. These ecosystems are home to rarer plants such as Nuttall's Waterweed (*Elodea nuttalli*) and Fen Orchid (*Liparis loeselii*).

These wetland ecosystems and streams in them are also critical habitats for amphibians, reptiles, and fish. Streams free of sediment from agriculture and construction are common on the reservation, providing habitat for the Tennessee Dace (*Phoxinus tennesseensis*). This pollution-intolerant species has a statewide distribution which is now concentrated in the Cherokee National Forest in Polk County and the Oak Ridge Reservation. In their 1993 book, *The Fishes of Tennessee*, David A. Etnier and Wayne C. Starnes say that the Oak Ridge Reservation may have become a stronghold for the species.

As one of very few large tracts of relatively unfragmented forested land remaining in the Ridge and Valley of East Tennessee, the Oak Ridge Reservation

plays an important role in nesting and migration of songbirds.

Populations of many songbirds are rapidly declining throughout the world, partly because once large forest blocks are now dwindling in size and quality throughout North America. Such large forest blocks protect breeding birds and their eggs and young from many predators—domestic and native—and from the parasitic Brown-headed Cowbird. Many songbirds nest here and even more stop to rest and eat during migration to and from wintering grounds in tropical habitats south of the U.S.

“The Oak Ridge Reservation provides high quality bird habitats because of its large size, position in the landscape, and long term commitment to habitat protection and research,” says Bob Ford, Southeast Partners in Flight Coordinator. “As breeding birds become a more visible part of management plans all across the nation, Oak Ridge has the opportunity to be at the forefront to further increase habitats and provide source populations for many priority bird species in the Ridge and Valley.”

Thanks to collaborative efforts of Partners In Flight, which monitors bird species at risk, we know that 23 of the top 25 priority species for conservation in this region are present on the reservation during breeding season and that many of these species are common or abundant.

In fact, four of the top 10 most common breeding birds on the reservation are among Partners in Flight's species of conservation concern.

In addition, species rarely found breeding elsewhere in the Ridge and Valley of East Tennessee such as the Blue-winged Warbler (*Vermivora pinus*), the Cerulean Warbler (*Dendroica cerulea*), the Grasshopper Sparrow (*Ammodramus savannarum*, and the Prothonotary Warbler (*Protonotaria citrea*)—are known to breed on the reservation. In fact, more species of breeding birds (nearly 200) have been documented on the Oak Ridge Reservation than on any other single tract of land in Tennessee, (*Tennessee Wildlife*, January/February 1998).

The Oak Ridge Reservation is also a Tennessee Wildlife Resources Agency (TWRA) wildlife management area. With more than 315 wildlife species present, this designation provides opportunities to protect and restore the more than 20 rare wildlife species as well as the once rare wild turkey (*Meleagris gallopavo*) and the previously federally listed osprey (*Pandion haliaetus*).

Not surprisingly, the public has enthusiastically welcomed public nature walks to view wildflowers, birds and other wildlife, historic sites, and streams.

These excursions tour parts of the reservation not normally open to the public. Working with the City of Oak



Oak Ridge National Laboratory



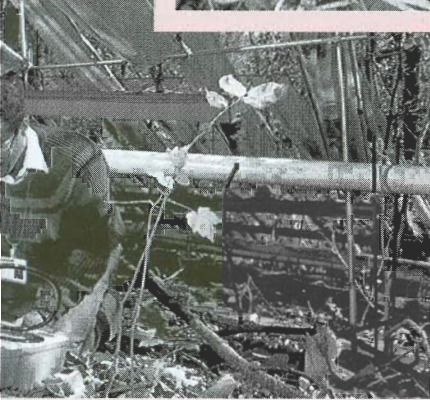
Oak Ridge National Laboratory

Left: Fen Orchid, endangered in Tennessee, is found only in Hembree Marsh, a forested wetland of the Bear Creek Floodplain State Natural Area on the reservation.



Oak Ridge National Laboratory

Above: Spreading False Fox Glove, threatened in Tennessee and imperiled globally, frequents shore area habitats along the Oak Ridge Reservation.



Right: The Canada Lily is listed as threatened in Tennessee and occurs infrequently across the reservation.



Oak Ridge National Laboratory

Ridge and Oak Ridge Greenways' members, the Department of Energy has opened two public greenway trails. Historic Freels cabin is the base for the Ecological and Physical Sciences Study Center, a hands-on learning experience initiated in 1984 for students (K-12) and teachers on the reservation.

Increased awareness of the biological richness has resulted in strong public interest in land use planning for the reservation, especially since the Department of Energy has been under increasing pressure to release land for residential and industrial development which has recently resulted in fragmentation and loss of habitat on parts of the site.

Advocates for the Oak Ridge Reservation President Dev Joslin states that "As the surrounding land area is consumed by suburban sprawl and industrial development, the public's appreciation of the uniqueness of such islands of biological richness as the Oak Ridge Reservation continues to grow.

"The reservation has tremendous potential for recreational use and scientific training for all ages in nature-related studies.

"The proximity to a large population area, the unequaled ecological beauty and diversity of the area and the presence nearby of remarkable scientific expertise in the environmental sciences together create a unique mix that should increas-

ingly provide a variety of opportunities for the public to experience, enjoy and learn about plant communities, wildlife conservation, and ecological processes," Joslin continues.

Changing missions for the Department of Energy has recently resulted in changes in land use, including privatization and industrialization.

Secretary of Energy Bill Richardson recently designated the "Three Bend Scenic and Wildlife Refuge" on the Oak Ridge Reservation to help balance recent industrialization with better protection for unique habitats and wildlife. This approximately 3,000-acre parcel includes one of the landscape complex areas recommended for protection by The Nature Conservancy.

Richardson's intent is that the refuge will be managed over the long-term for preservation purposes through a cooperative arrangement between DOE and the Tennessee Wildlife Resources Agency.

Although once representative of the region's landscape, the Oak Ridge Reservation is now "uncommon ground," an island of biological significance in a sea of declining biodiversity. As urban and agricultural development have expanded, the types of ecosystems native to the Ridge and Valley have become more fragmented and less widespread, thus, making their existence on the Oak Ridge Reservation increasingly important

at a local, regional and national level.

On Oct. 21, a nature ramble on the reservation is scheduled, sponsored by the Oak Ridge National Laboratory and the American Museum of Science and Energy. The same sponsors will host a walk and talk about pre-World War II life on the Oak Ridge Reservation on Oct. 28. The hikes are free, but pre-registration is required and group size is limited. For information, call the museum at 865-576-3218.

For more information about the Oak Ridge National Environmental Research Park, contact the research park manager, P.O. Box 2008, Oak Ridge, TN 37831-6038 or check out the Web site: <http://www.esd.ornl.gov/facilities/nerp/>.



(Pat Parr is area manager for Oak Ridge National Laboratory and past-president of the Association of Southeastern Biologists. Linda Mann is an ecologist in Environmental Sciences Division of Oak Ridge National Laboratory and Brian Bowen is the Tennessee Natural Areas Program coordinator with the Tennessee Department of Environment and Conservation's Division of Natural Heritage.)