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ENVIRONMENTAL ASSESSMENT ADDENDUM FOR THE PROPOSED TITLE TRANSFER OF PARCEL ED-1

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U.S. Department of Energy
Oak Ridge Operations
Oak Ridge, Tennessee

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ACRONYMS

CFR	*Code of Federal Regulations*
CROET	Community Reuse Organization of East Tennessee
DOE	U.S. Department of Energy
DOE-ORO	U.S. Department of Energy-Oak Ridge Operations
EA	Environmental Assessment
EFPC	East Fork Poplar Creek
EIS	Environmental Impact Statement
E.O.	Executive Order
EPA	U.S. Environmental Protection Agency
ETTP	East Tennessee Technology Park
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FRP	Facilities Revitalization Project
FWS	U.S. Fish and Wildlife Service
FY	fiscal year
gpm	gallons per minute
JINS	Joint Institute for Neutron Sciences
MAP	Mitigation Action Plan
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
PIF	Partners In Flight
ROD	Record of Decision
ROI	Region of Influence
ROW	right-of-way
SNS	Spallation Neutron Source
SR	State Route
TDEC	Tennessee Department of Environmental Conservation
TDOT	Tennessee Department of Transportation
TN-SHPO	Tennessee-State Historic Preservation Office
TRU	transuranic
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Association
Y-12	Y-12 National Security Complex

1. INTRODUCTION

1.1 PURPOSE AND NEED FOR U.S. DEPARTMENT OF ENERGY ACTION

The purpose for U.S. Department of Energy (DOE) action is the title transfer of excess DOE real property in order to continue to support economic development in the region. This proposed action is being evaluated in response to a proposal from Horizon Center LLC, a subsidiary of the Community Reuse Organization of East Tennessee (CROET), requesting transfer of title of the presently leased Parcel ED-1 (also known as Horizon Center) (Fig. 1.1). DOE's action is needed to help offset economic losses resulting from DOE downsizing, facility closures, and workforce restructuring. DOE also recognizes that transferring excess land for economic development purposes can benefit the federal government by reducing or eliminating landlord costs.

1.2 BACKGROUND

In January 1996 DOE executed a lease for the approximate 957-acre Parcel ED-1 to CROET to develop an industrial/business park. The lease subsequently became effective in April 1998. This action was preceded by an Environmental Assessment (EA) (DOE 1996a) resulting in a finding of no significant impact (FONSI) that was conditional upon the implementation of mitigation and monitoring.

In accordance with 10 *Code of Federal Regulations* (*CFR*) 1021.331, a Mitigation Action Plan (MAP) (DOE 1996b) was prepared that described measures to be implemented to monitor and mitigate potentially significant adverse impacts that could occur from development on Parcel ED-1. The MAP accomplished this by excluding areas of Parcel ED-1 from disturbance and development, and requiring that surveys and monitoring be conducted prior to disturbance (pre-development) and during industrial operations (post-development). The objectives of these measures included (1) protection of wildlife habitat, plant communities, threatened and endangered species, water resources, wetlands, and historic and archaeological resources; (2) maintenance of habitat connections to reduce the ecological effects of fragmentation; (3) pre- and post-construction assessment of natural succession and impacts of development on natural communities and populations using data collected during monitoring; and (4) identification of additional mitigation, as needed, to remediate the actual significant adverse effects of development.

A requirement of the MAP was the preparation of annual reports by DOE to document baseline conditions; compile survey data and monitoring status; and describe planning, construction, and operational phases of the development. The 1997 Annual Report (DOE 1997a) documented pre-development conditions to use as a baseline, and it established monitoring sites for future use. The 1998 Annual Report (DOE 1998) described progress toward meeting objectives of the MAP during the site development planning and early construction phases. Specifically, the report addressed development alternatives, pre-construction surveys, and monitoring plans during construction.

A plan was developed to meet economic development goals while adhering to the commitments in the FONSI and MAP. A main goal of the development plan was to maximize developable acreage while preserving important ecological and scenic features of the parcel. To meet this goal, developable areas were designated and are adjacent to the boundary of the Natural Area (formerly referred to as the Exclusion Area) (Fig. 1.2). The Natural Area comprises approximately 489 acres and includes East Fork Poplar Creek (EFPC) and its 100-year floodplain, a minimum of a 100-ft stream buffer, and other important ecological and scenic features. Planning and layout of the site also relied heavily on several

ecological studies designed to avoid federally or state-listed species and to minimize the impact to stream and floodplain crossings. The objective of the 1999 and 2000 Annual Reports (DOE 1999a and 2000a) was to document the commitment to monitor specified environmental resources during early site construction and operation as development matured.

CROET awarded construction contracts for clearing right-of-ways for roads, utilities, borrow areas, and a sub-leased parcel soon after the lease was activated in the summer of 1998 (Fig. 1.3). Permits were obtained for construction of culverts and bridges in late 1998 and construction began soon afterward. Construction was completed in 1999. Permits were obtained for sewer and water distribution systems in 1999. Construction began on the first sub-leased parcel (the Theragenics Center) in the summer of 1999. Grading and the foundation for the Theragenics building were completed by the last of November and erection of steel began in December. A major emphasis in 2000 was directed toward completion of road construction, installation of underground utilities in the road right-of-ways, and the completion of the construction on the Theragenics Center.

Three new sites were cleared and prepared for construction in 2000 (Fig. 1.3). The first of these was an addition to the Communications Center and fiber optic hub facility located on about 1 acre near the middle of Parcel ED-1. A second was the erection of a new telecommunications tower on a 0.25-acre site in the northwest sector of the parcel. The third involved clearing and grading of approximately 15 acres along the Oak Ridge Turnpike [State Route (SR) 95] immediately east of the west entrance to the parcel. Activities since 2000 have primarily been to clear brush and remove dead pines (due to the Southern pine beetle infestation), at the corner properties where the park roads intersect with the Oak Ridge Turnpike, and other routine maintenance activities.

On February 21, 2002, CROET submitted a proposal to DOE requesting the title transfer of Parcel ED-1 (Appendix A). On August 19, 2002, CROET submitted a supplement to their proposal requesting that the transfer be to their subsidiary, Horizon Center LLC. As part of the evaluation of the proposal, DOE began to meet the requirements necessary to support the proposed transfer of title, including reviewing and updating the existing National Environmental Policy Act documentation.

One of the first actions by DOE after receipt of CROET's proposal was to convene a peer review of the existing MAP. The Peer Review Team met in Oak Ridge on March 12-14, 2002. The goals of the Team were the following:

1. Assess the monitoring data collected to date and establish if the requirements of the MAP have been met.

2. Determine if changes to the MAP are warranted due to the intended future use of Parcel ED-1 and plans for activities adjacent to the parcel [e.g., Tennessee Department of Transportation (TDOT) expansion of SR 95].

3. Clarify the future monitoring and mitigation requirements, including defining when mitigation is necessary.

4. Identify when the next review of the MAP should be conducted.

DOE initiated preparation of this EA Addendum soon after the peer review. In addition, the recommendations of the Peer Review Team were incorporated into a revised MAP.

2. DESCRIPTION OF TRANSFER ALTERNATIVE (NEW PROPOSED ACTION)

DOE, in its EA prepared in 1996, analyzed two alternatives: the proposed action for leasing Parcel ED-1 and no action. Two other alternatives: lease of other Oak Ridge Reservation (ORR) land and disposal (e.g., sale, donation, transfer to another federal agency, or exchange) of Parcel ED-1 were dismissed from further consideration. DOE concluded, in the EA, that no other parcels of sufficient size and contiguity were available on the ORR to meet the requirements for an industrial park. Further, DOE determined that the alternative of disposal did not meet the stated purpose and need, and it should retain title of the property in order to encourage the kind of investment necessary for long-term commercial development and maintain measures to preserve environmentally sensitive areas.

CROET indicated in their proposal to DOE that, based on the 6 years of time that has elapsed between the decision to lease Parcel ED-1 and the present, the kind of investment necessary for long-term, commercial development of the parcel is not possible without ownership of the land. The lease option has limited the marketability of Parcel ED-1, mainly due to private sector financing issues with some prospective companies. While the current lease mechanism does provide development opportunities, transfer of title to Horizon Center LLC is necessary for the ultimate development of the parcel. CROET, the City of Oak Ridge, and the state of Tennessee have also made a considerable investment (~$14.25 million) in infrastructure improvements to make Parcel ED-1 developable and competitive. According to CROET, and consistent with similar land parcels planned for industrial/business development, transfer is essential for the site to be viable.

The purpose of this EA Addendum is to supplement the EA completed in 1996 by analyzing the proposal to transfer title of Parcel ED-1 to Horizon Center LLC. The proposed action is transfer of title of the entire Parcel ED-1. However, as an option, DOE could choose to only transfer the developable portion of Parcel ED-1. The remaining property would stay under DOE ownership and control. Requirements would be included in the appropriate documents to ensure that the Natural Area is maintained and protected. Another option is to transfer all of Parcel ED-1, except for EFPC and its floodplain, which would remain under DOE ownership and control in order to address possible future requirements under the Comprehensive Environmental Response, Compensation, and Liability Act. The potential for adverse impacts to occur would be greater from the transfer of the entire parcel than from either of the two options. For purposes of comparison, it was determined that if DOE chose not to transfer Parcel ED-1 (i.e., no action) the current lease with CROET would continue.

Under the proposed transfer of title, Horizon Center LLC would continue the development of Parcel ED-1 as an industrial/business park for research and development, medical technology, manufacturing, distribution, and corporate headquarters office facilities. Continued development would be located in areas outside of the existing Natural Area. The developable acreage is approximately 489 acres of the 957-acre parcel and consists of seven major development areas, ranging in size from 11 to 148 acres (see Fig. 2.1).

Horizon Center LLC would be responsible for the continued protection of the remaining 468 acres of the 957-acre parcel. Conditions of the transfer documents would ensure that Horizon Center LLC continued to provide protection of wildlife habitat, sensitive plant communities, threatened and endangered species, water resources, wetlands, and historic and archaeological resources within the Natural Area. If Horizon Center LLC fails to abide by the provisions of the transfer documents, then ultimately, DOE has the right of judicial enforcement of the Quitclaim deed.

Title of Parcel ED-1 would be transferred under Sect. 161(g) of the Atomic Energy Act of 1954. The process that would be used is described in a DOE-issued interim final rule, "Transfer of Real Property at Defense Nuclear Facilities for Economic Development" (10 *CFR* Part 770). The rule became effective on February 29, 2000 [65 *Federal Register (FR)* 10685]. The *FR* notice of the rule is provided in Appendix B. The deed will contain restrictions ensuring 1) continued protection of the Natural Area and 2) uses of the developable areas are consistent with those analyzed in the 1996 EA. The requirement to comply with the provisions of the MAP will be in the appropriate documents.

This proposed action does not differ substantially from the proposed action described in the EA prepared for leasing Parcel ED-1 to CROET. The major difference is that ownership of the property would be transferred to Horizon Center LLC. It is still their intent to develop the parcel as an industrial/business park. Industrial uses would still be limited to those analyzed in the 1996 EA and would be required to conform to the City of Oak Ridge Zoning Ordinance (Chap. 7, Sect. 6-713 IND-2, Industrial Districts). The restriction of certain uses that would not be permitted (i.e., airport, wholesaling facilities, bulk oil and similar storage facilities) is also included as part of this proposed action.

Based on a study commissioned by a partnership between CROET, the City of Oak Ridge, and the Oak Ridge Chamber's New Century Alliance, cluster groupings of industry types were identified for targeted recruitment for Parcel ED-1. These industries are consistent with those analyzed in the EA and include:

- Plastic Materials and Resins
- Biotech Products and Pharmaceuticals
- Radio and Television Communications Equipment
- Motor Vehicle Parts and Accessories
- Surgical and Medical Instruments and Apparatus
- Electro Medical and Electrotherapeutic Apparatus
- Professional Computer Services

3. AFFECTED ENVIRONMENT

The following sections update information found in the "Affected Environment" section of the Parcel ED-1 EA prepared in 1996 (DOE 1996a). As stated in Sect. 1.2, several changes have taken place on Parcel ED-1 since the activation of CROET's lease in 1998, including road, bridge, and utility construction; clearing and grading of some development areas; and building construction. For certain resources, the affected environment information presented in the 1996 EA is still valid and has not changed. For this reason the following resources are not addressed in this section of the EA Addendum: geology, climate and air quality, water resources, and various information under socioeconomics. A Floodplain Assessment was completed for the proposed action in accordance with 10 *CFR* 1022, Compliance with Floodplain/Wetlands Environmental Review Requirements. The Floodplain Assessment is presented in Appendix C.

3.1 LAND USE

The completion of initial development activities at Parcel ED-1 has changed the land use and appearance of the parcel consistent with the existing EA and MAP. Parcel ED-1 was a relatively undisturbed area with the previous land use consisting of wildlife management, silviculture, ecosystem research, and environmental monitoring. The visual character of the parcel is now that of an industrial/business park, which is the goal of the development plan. Since 1998, over 100 acres have been

cleared and graded for construction purposes. Development has also included construction of roads and utilities, two bridges across EFPC, borrow areas, and the clearing and grading of other areas. Construction has also been completed on a portion of one of the developable parcels (the Theragenics Center). In addition, the Communications Center and a telecommunications tower have been constructed (Fig. 1.3). Theragenics Corporation, the first company to locate within the park, currently is leasing 21 acres from CROET and has an option on an additional 21 acres. Theragenics Corporation has built an approximate $30-million facility that will be used for the manufacture of a proprietary radioactive seed implant for the treatment of prostate cancer.

In 1999, DOE granted a license to the City of Oak Ridge to use the existing DOE patrol road for the Oak Ridge North Boundary Greenway. An approximate 1.5-mile long section of the greenway is located along the western boundary of Parcel ED-1 (Fig. 2.1).

In a letter dated August 21, 1995, and again on August 21, 2001, the U.S. Environmental Protection Agency (EPA) concurred with DOE's determination that Parcel ED-1 is not contaminated, with the exception of EFPC and Bear Creek and their associated floodplains (see Appendix D).

3.2 ECOLOGICAL RESOURCES

In 1997 Lockwood Greene Engineers, Inc., under contract to CROET, created a development plan for Parcel ED-1. A key objective was to maximize the developable acreage while preserving the important ecological and scenic features of the parcel. The development plan concepts were discussed with the U.S. Fish and Wildlife Service (FWS), Tennessee Department of Environment and Conservation (TDEC), and the Tennessee Wildlife Resources Agency (TWRA) and were approved by DOE. Information on the development plan and agency coordination is provided in the 1998 and 1999 Annual Reports (DOE 1998 and 1999a).

Master planning and layout of the site relied heavily on several ecological studies designed to avoid threatened and endangered species, unique or sensitive habitats, and to minimize impacts at stream and floodplain crossings. As data were collected, the Natural Area boundaries were slightly reconfigured (see Fig. 2.1). Reconfiguration provided practical utility for development while mitigating impacts to the original designated Exclusion Area. The details of the development plan, including changes to the Natural Area, are presented in the 1998 Annual Report (DOE 1998).

Additional information and data on the ecological resources of Parcel ED-1 have been collected since the initial information was presented in the 1996 EA. This information and these data are included in the annual reports that have been prepared by DOE (DOE 1977a, 1998, 1999a, and –2000a).

The 1996 EA included information on several bird species that use the habitats on Parcel ED-1. It also included nationally declining species identified during a 1995 Partners in Flight (PIF) survey along the proposed northern boundary of the parcel. Since 1996, additional PIF surveys have been conducted and additional nationally declining species have been documented on site in the DOE Annual Reports (DOE 1997a, 1998, 1999a, 2000a). Also, Executive Order (E.O.) 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, was issued in January 2001. In addition to the bird species listed in the 1996 EA, the Prairie Warbler, Blue-winged Warbler, Prothonotary Warbler, and the Cerulean Warbler have been identified as occurring on the site.

The Cerulean Warbler is state-listed as "Deemed In Need of Management" and is being considered for state listing as "Threatened," as well as being considered for federal listing because of a sharp decline in its range-wide population. National breeding bird survey data show a roughly 70% decline in the range-wide population of this bird between 1966 and 1998. This decline may be caused by mature forest

habitat loss and fragmentation, short rotation cycles of commercial forests, changes in tree species composition of forests, and nest parasitism by Brown-headed Cowbirds (Hamel 2000). Tennessee breeding bird survey data suggest that the primary period of population decline of the Cerulean Warbler happened prior to 1980 (Nicholson 1997).

In Tennessee, the Cerulean Warbler is found in two different habitat types: bottomland hardwood forests and mesic slopes of mountains. They occur locally across the state, with the highest population densities being in the Cumberland Mountains of the Northern Cumberland Plateau Physiographic Area (Nicholson 1997). Distinct gaps in the regional distribution of the Cerulean Warbler occur in the Southern Ridge and Valley Physiographic Area, in which Parcel ED-1 is located, the Central Basin, and uplands of the Coastal Plain of west Tennessee (Nicholson 1997).

Recent records for the Cerulean Warbler on Parcel ED-1 list singing individuals as being identified for four consecutive years along the North Boundary Greenway in the vicinity of EFPC and Development Area 4. A survey of Cerulean Warbler occurrence was conducted in the spring of 2000 on portions of TWRA's Royal Blue Wildlife Management Area in Campbell and Scott Counties. A total of 343 singing individuals identified as Cerulean Warblers were counted during 8 days of surveys (Welton 2000).

Recently the native vegetation throughout Tennessee has been severely impacted by introduced plant species that are invasive. These plants are called exotics because humans introduce them into a region either deliberately or accidentally. Aggressive exotic species can outcompete and exclude native vegetation and thus, reduce overall plant biodiversity, and affect the development and functioning of natural communities. Of the 167 exotic plant species known to occur on the ORR, 43 are considered to be invasive, aggressive species (Awl et al. 1996). Some of these species include Japanese honeysuckle (*Lonicera japonica*), kudzu (*Pueraria lobata*), microstegium (*Eulalia viminea*), privet (*Ligustrum sinense* and *L. vulgare*), cinnamon vine (*Dioscorea batatas*), multiflora rose (*Rosa multiflora*), autumn olive (*Eleagnus umbellata*), and oriental bittersweet (*Celastrus orbiculatus*). Fourteen exotic plant species have been identified as occurring on Parcel ED-1 and 12 of these are considered to be invasive species. A complete listing of the invasive and aggressive exotic plant species on the ORR and exotic species found on Parcel ED-1 is presented in the 1997 Annual Report (DOE 1997a). Additional information, including a list of invasive exotic plants in Tennessee and their "threat" ranking, is provided by the Southeast Exotic Pest Plant Council (http://www.se-eppc.org).

3.3 SOCIOECONOMICS

3.3.1 Demographic and Economic Characteristics

Table 3.1 summarizes population, per capita income, and wage and salary employment information from 1995 to 2000. Population has increased slightly over the 5-year period; Loudon County showed the fastest growth, while Anderson County showed a slight decline in population. Employment for the region (Anderson, Roane, Knox, and Loudon Counties) grew slowly from 340,422 in 1995 to 364,698 in 2000. Employment actually declined in Roane County, and grew only slightly in Anderson County following declines in 1996 and 1997. Per capita income for the region increased by roughly 4%, growing fastest in Knox and Loudon Counties. Total personal income grew from $11.8 billion to $14.9 billion over the same period (Bureau of Economic Analysis 2002).

Table 3.1. Demographic and economic characteristics in the Oak Ridge Region of Influence

County	1995	1996	1997	1998	1999	2000	Annual growth 1995–2000 (%)
			Anderson				
Population	71,597	71,797	71,736	71,321	71,454	71,269	-0.09
Per capita income ($)	22,179	22,586	23,392	24,500	24,847	26,032	3.26
Total employment	50,088	48,315	48,109	50,139	50,563	50,984	0.36
			Roane				
Population	49,892	50,727	51,179	51,462	51,736	51,943	0.81
Per capita income ($)	19,166	19,160	19,379	20,116	20,895	22,000	2.80
Total employment	27,670	28,043	25,753	25,541	25,099	24,281	-2.58
			Knox				
Population	369,171	373,621	376,767	378,319	380,010	382,723	0.72
Per capita income ($)	23,059	23,736	24,559	26,092	26,582	28,281	4.17
Total employment	247,713	252,955	257,256	261,899	266,030	273,547	2.00
			Loudon				
Population	35,479	36,572	37,427	38,068	38,741	39,253	2.04
Per capita income ($)	20,540	21,108	22,227	23,301	24,385	26,241	5.02
Total employment	14,951	14,894	15,220	14,982	15,269	15,886	1.22
			Region Totals				
Population	526,139	532,717	537,109	539,170	541,941	545,188	0.71
Per capita income ($)	22,401	22,965	23,748	25,113	25,654	27,242	3.99
Total employment	340,422	344,207	346,338	352,561	356,961	364,698	1.39

Source: Bureau of Economic Analysis 2002.

3.3.2 Fiscal Characteristics

Oak Ridge City general fund revenues for fiscal year (FY) 2000 and anticipated revenues for FY 2002 are presented in Table 3.2. The general fund supports the ongoing operations of local governments, as well as community services, such as police protection and parks and recreation. The largest revenue sources have traditionally been local taxes (which include taxes on property, real estate, hotel/motel receipts, and sales) and intergovernmental transfers from the federal or state government. Nearly 90% of the FY 2000 general fund revenue came from these combined sources. Local property taxes are expected to account for nearly half (43%) of the FY 2002 general fund revenues (City of Oak Ridge 2001). For FY 2003, the property tax rate was $2.65 per $100 of assessed value. The assessment rate for industrial property was 40% (Boyer 2002). The City also receives a payment in-lieu-of-tax for the ORR acreage that falls within the city limits. For FY 2001, the payment was based on a value of $5,327/acre, and the farmland assessment rate of 25% (DOE 2002).

3.4 INFRASTRUCTURE AND SUPPORT SERVICES

3.4.1 Transportation

As stated in Sects. 1.2 and 3.1, initial road construction within Parcel ED-1 was completed in 2000. The existing road system within the parcel consists of two, four-lane entrance boulevards off of the Oak Ridge Turnpike that connect into a three-lane central roadway (Fig. 1.2). Construction of the entrance boulevards also necessitated the construction of two bridges across EFPC. The bridges consist of concrete

Table 3.2. City of Oak Ridge Revenues for FY 2000 and FY 2002

Revenues	2000 Actual[a]	2002 Budgeted
Taxes	15,102,649	17,820,500
Licenses and permits	251,324	252,000
Intergovernmental revenues	9,354,396	9,869,000
Charges for services	1,366,592	1,325,721
Fines and forfeitures	301,216	400,000
Other revenues	1,442,300	970,500
Total revenues	27,818,477	30,637,721
Expenditures and other financing		
Expenditures	(13,434,582)	(14,311,671)
Other financing uses[b]	(14,626,371)	(18,033,281)
Total expenditures and other financing	(28,060,953)	(32,344,952)

[a]2001 actuals are not available.
[b]Includes items such as capital projects fund, economic diversification fund, debt service, and schools.
Source: City of Oak Ridge 2001.
FY = fiscal year.

slab decks supported by pre-cast concrete girders, and they are approximately 133 ft long and 70 ft wide. A two-lane access road has also been constructed into the Theragenics Center, and smaller unimproved roads have been cut into some of the development areas for borrow site access and other construction activities.

3.4.2 Water Supply

Domestic and fire protection water supply comes from the ETTP filtration and treatment facility (K-1515) via a connection to an existing water main located south of the Oak Ridge Turnpike (SR 95). A 12-in. potable water line enters Parcel ED-1 along the east side of the west entrance boulevard. Water service through Parcel ED-1 is routed along the road right-of-ways (ROWs). This service provides up to 300 gallons per minute (gpm) for operational needs and an additional 1000-gpm reserve for fire protection. The K-1513 pumping station and the K-1515 facility are currently scheduled for transfer to CROET in FY 2004. If transfer is not achieved, they will be demolished under the Oak Ridge Performance Management Plan. As development increases, plans call for connection to an auxiliary water tank to be constructed on Development Area 6. Future service is planned with a service connection from the City of Oak Ridge system. This future tie-in to the City's system is dependent upon the completion of a new water line that is part of the Partners-for-Progress initiative to extend utilities to the western portion of Oak Ridge (see Sect. 5.1). Completion of the new water line may be 3 years away.

3.4.3 Wastewater

An existing 15-in. line located south of the East Tennessee Technology Park (ETTP) provides sanitary sewer service for Parcel ED-1. This existing line flows to the ETTP wastewater treatment facility (K-1203). At Parcel ED-1, a force-main leaves a pump station located west of the western entrance boulevard and south of EFPC. It extends south, adjacent to the west boulevard to the north side of the Oak Ridge Turnpike. The new force-main runs west along the Turnpike to the ETTP connection location. Under the Oak Ridge Performance Management Plan the K-1203 facility is scheduled for demolition unless it is transferred to CROET or another entity. Future plans include a tie-in to a new City of Oak Ridge wastewater treatment plant (Rarity Ridge), which is currently under construction, west of the Clinch River, approximately 4 miles west of the existing pump station.

3.4.4 Electricity

Initial electrical service to Parcel ED-1 is provided by an extension of the existing 13.8-kV, 3-phase, dual primary-feed service, via overhead line from ETTP. The line extends about 1.7 miles, along an existing transmission line ROW to the Oak Ridge Turnpike, then to Parcel ED-1 where electrical service is distributed through an underground duct-bank to the development areas. This service is satisfactory for the initial phases of development. To address future needs, an addition to the adjacent Tennessee Valley Authority (TVA) Roane Substation is under construction and is expected to be available in 2003.

3.4.5 Natural Gas

Natural gas is provided to Parcel ED-1 from an 8-in., 375-psi pipeline maintained by the Oak Ridge Utility District. The existing high-pressure pipeline is routed east along the north boundary of Parcel ED-1 to the northwest corner of Development Area 6. A 6-in. service line is routed south from a regulator station in an easement along the west boundary of Development Area 6 to the central roadway. Distribution to all other development areas occurs within ROWs of the central roadway and entrance boulevards. To achieve future service redundancy, an extension of the high-pressure main along the north boundary, to a connection at a 10-in., high-pressure main along the Oak Ridge Turnpike, is planned by Oak Ridge Utility District.

3.4.6 Telecommunications

Fiber-optic telecommunications service is provided by extending lines underground from an existing 144 single-mode fiber-optic cable tap near the west boundary of Parcel ED-1. The new fiber-optic lines are routed into the parcel, then to a terminal building that serves as both a communications and visitor center. Fiber-optic service for telephone, computer data lines, cable TV, fire, and security systems is routed along the road ROWs to all development areas via six, 4-in. conduits in an underground duct bank.

3.5 CULTURAL RESOURCES

The previous EA stipulated a need for a cultural and archaeological survey on an 80-acre portion of Parcel ED-1 that was not previously surveyed. The area is located in the western end of the parcel, bounded on the north by EFPC and on the south by McKinney Road. Development Area 4 is located within the area.

During the summer of 1997, archaeologists conducted a Phase I Cultural Resources Survey of the defined area. The objectives were to document and identify resources within the area that could be of historic or cultural significance. This was accomplished by a records search, a site pedestrian survey, and a shovel testing investigation. The results of the survey are presented in the 1998 Annual Report (DOE 1998). Based on the results, DOE determined that the proposed development of the area would have no effect on any archaeological or historical resources. The Tennessee-State Historic Preservation Office (TN-SHPO) concurred with DOE's determination and stated that they had no objection to the implementation of the project (see Appendix D).

Construction activities on Parcel ED-1 have avoided all known cultural resources. The 100-ft buffer placed around the McKamey-Carmichael cemetery has been maintained (DOE 2000a). Sites 40RE195 and 40RE200 are foundation-only mill sites. Both sites are located adjacent to EFPC (DOE 1996a). These sites are protected because they are within the Natural Area. In cooperation with the TN-SHPO, CROET placed millstones from these sites at the Wheat Community Church for preservation and display.

4. ENVIRONMENTAL CONSEQUENCES

Potential environmental impacts that could result from the proposed title transfer of the developable portion of Parcel ED-1 were evaluated for the following: land use, geology and soils, air quality, water resources, ecological resources, cultural resources, socioeconomics, infrastructure and support services, noise, and health and safety. Potential impacts identified were compared with the results of the analysis conducted for the 1996 EA.

Impacts have already occurred on the parcel as a result of construction activities (i.e., roads, bridges, utilities) undertaken by CROET. Remaining development includes the continued build-out of the developable areas as industries and businesses are recruited, and the extension of access roads and utilities into those areas. Based on information from Horizon Center LLC, this would occur in phases so that large areas would not be under development at any one time. Also, CROET's earlier development plan for the parcel included future construction of an additional road bridge crossing EFPC and a rail spur that would cross Poplar Creek and EFPC. Horizon Center LLC has indicated that these are no longer being considered because of cost and other reasons.

The restrictions that provide for environmental protection, which are specified in the current lease, would be carried forward to the appropriate transfer documents. Only the transfer of the entire parcel was evaluated for potential environmental impacts since it was determined that any impacts resulting from the options described in Sect. 2 would be less than the transfer of the entire 957 acres. For purposes of comparison it was determined that if DOE chose not to transfer Parcel ED-1 (i.e., no action) the current lease with CROET would continue.

Land use, threatened and endangered species, cultural resource, and socioeconomic impacts are discussed below only because they are where change could have occurred since CROET began development of the parcel.

4.1 LAND USE

The build-out of Development Area 4 could adversely impact an approximate 1.5-mile section of the North Boundary Greenway that borders the western boundary of Parcel ED-1. Future development of this area would require that the existing DOE patrol road be widened and paved to accommodate traffic that would access the area during construction and facility operations. Currently, the use of this road for the greenway is permitted under a license granted by DOE to the City of Oak Ridge. Upon title transfer of Parcel ED-1, the road would become the property of Horizon Center LLC. One option to offset potential impacts is for the City of Oak Ridge and Horizon Center LLC to enter into discussions regarding the continued use of the greenway. Mitigation measures could be enlisted as well as improvements that could enhance the public's use of the area, such as the construction of a foot/bike path as part of any road improvements that would be needed to provide access into Development Area 4.

Limited encroachment into the 100-year floodplain, which was covered under a U. S. Corps of Engineers Nationwide Permit (33 CFR 330), has already occurred during construction activities associated with the initial development of Parcel ED-1 under the lease. No additional adverse direct or indirect impacts to the floodplain are expected except for potential minor encroachments into two small areas of the floodplain in the developable areas. These encroachments would be for construction of a parking area and road and bridge improvements. The proposed action will conform to all applicable floodplain protection standards including regulation by the U.S. Army Corps of Engineers, Tennessee

Department of Environment and Conservation, and if required, the Tennessee Valley Authority. Additional information is contained in the Floodplain Assessment in Appendix C.

4.2 THREATENED AND ENDANGERED SPECIES

Oak Ridge National Laboratory (ORNL), as part of its pre-development monitoring, and CROET, as part of the design of the development plan for Parcel ED-1, conducted extensive surveys for threatened and endangered plant and animal species, other sensitive or rare species, and any supportive habitat. These surveys are documented in the annual reports that DOE has published (DOE 1997a, 1998, 1999a, 2000a). The surveys resulted in the identification of three protected plant species: goldenseal (*Hydrastis canadensis*) [State Threatened], ginseng (*Panax quinquefolium*) [State Special Concern species because of commercial exploitation], and pink lady slipper (*Cypripedium acaule*) [State Threatened]. The Tennessee dace (*Phoxinus tennesseensis*) state-listed as "Deemed In Need of Management" has been found in Dace Branch (Fig. 2.1). The southeastern shrew (*Sorex longirostris*) and sharp-shinned hawk (*Accipiter striatus*) "Deemed In Need of Management" have also been observed on Parcel ED-1.

The transfer of Parcel ED-1 would not result in any additional impacts to the protected plant species, Tennessee dace, southeastern shrew, or the sharp-shinned hawk. The plant species and Dace Branch are located in the Natural Area, as is the habitat for the southeastern shrew and sharp-shinned hawk. The terms of the transfer documents would ensure the protection of the Natural Area. Encroachment into the sensitive areas where federal or state-listed species are known to be present would be prohibited.

Site preparation and construction activities during 1998 and 1999 resulted in exposing large areas of soil in the vicinity of Dace Branch. Two major storm events in the early spring of 1999 overran the silt fence allowing sediments to enter Dace Branch. In fall 1998, the number of Tennessee dace was 19, a number higher than previously recorded (DOE 1998). In spring 1999, four individuals were found (DOE 1999a). In October 1999, there were only two individuals, and none were found during the spring 2000 sampling (DOE 2000a). A population of Tennessee dace was found upstream of normal sampling location (DBK 0.3). This population was located upstream from influences of construction and downstream from culverts under the Oak Ridge Turnpike. It was believed that these fish would serve to repopulate the downstream reaches of Dace Branch as the stream recovered from the 1999 storm events. Sampling to confirm this has been conducted and the results will be reported in the next Annual Report. Also, the construction activities near Dace Branch have been completed and the disturbed areas surrounding the stream have been stabilized. This is serving to buffer and protect the stream from additional sedimentation. However, it is possible that other future activities, not related to the further development of Horizon Center (e.g., TDOT's expansion of SR 95), could adversely impact Dace Branch.

Impacts to rare and listed bird species were analyzed in the 1996 EA. However, construction activities associated with Development Area 4 could result in adverse impacts to the Cerulean Warbler, Wood Thrush, Kentucky Warbler, and Prothonotary Warbler. Loss of habitat from the complete or partial clearing of the woodland would be the greatest detriment to these species. Adverse impacts from further forest fragmentation could also result from improvements to the existing DOE patrol road to provide access into the area for construction and operational activities. Development could also result in positive impacts to species such as the Blue-winged Warbler and Prairie Warbler that prefer early succession and scrub-shrub habitats. This type of habitat often results when areas are cleared to support construction activities and then left to develop ruderal habitat. However, unless maintained as early succession or scrub-shrub habitat, such as a powerline ROW, the positive impacts of this type of additional habitat would be temporary. Another potential result of increased forest fragmentation from the development of Parcel ED-1 is the potential increases of other nest predators, such as raccoons and skunks. Often,

populations of these species increase as a result of habitat changes and increased human activity, which also provide them greater access to sensitive species.

Although locally important, the loss of a minimal amount of marginal Cerulean Warbler habitat within the Southern Ridge and Valley Physiographic Area would not have a major adverse impact on the species. The recent establishment of 75,000 acres of public access-managed timberland just north of Parcel ED-1 near TWRA's Royal Blue Wildlife Management Area in Campbell and Scott Counties would likely provide significant opportunities for mitigation on a regional basis. With the surface rights to be deeded to the TWRA, the management of this tract, known as the Cumberland Forest, will be performed under restrictive covenants that will ensure the use of environmentally sound timber management practices that will protect the ecosystem. A primary management goal is the protection of rare species (Simmons 2002).

The introduction of, or population changes in, some exotic plant species cannot always be directly linked to any one specific activity in the immediate area or to specific sources. For instance, privet has been widely planted as an ornamental hedge in residential and commercial areas. Because birds favor privet fruits, the seeds can be widely dispersed from their source. In addition, favorable privet habitat includes floodplains where flooding can spread the seeds to downstream areas far from their original source. In this case, the dominance of privet in some areas of the floodplain is an indirect impact of human activities, but the source of the initial introduction and the pattern of subsequent spread would be difficult to determine. In contrast, exotic species that are not readily naturally introduced into new areas because of their dispersal and growth characteristics, can be introduced into and spread throughout a new area as a direct result of human activities, such as propagules attached to vehicles and equipment; intentional introduction in landscaping and erosion control, and; forest clearing, which enables opportunistic species to gain a foothold. In addition, site development may result in habitat alterations that favor the spread of existing exotic species into communities and locations in which they did not occur prior to development.

Horizon Center LLC would only be held accountable for natural succession within the Natural Area, with respect to preventing and controlling exotic/invasive plants in areas of known sensitive plant communities. Horizon Center LLC would also be encouraged to continue its efforts to prevent the introduction of non-native species on Parcel ED-1. Especially important is the continuance of including the native plant recommendations and list of plant species to avoid in the Horizon Center LLC Covenants, Conditions, and Restrictions.

DOE has sent informal consultation letters to the FWS providing them information about the proposed title transfer. As part of this informal consultation, DOE informed the FWS of their decision to transfer title to only the developable portions of Parcel ED-1 and provided them with the Quitclaim Deed conditions applying to the protection of listed species and their habitat. A letter received by DOE from the FWS dated September 18, 2002, stated that the supporting information for the proposed title transfer is adequate and supports the conclusion of not likely to adversely affect. Copies of correspondence from the FWS are included in Appendix D.

4.3 CULTURAL RESOURCES

No impacts to any known archaeological or historical resources located within Parcel ED-1 would result from the title transfer of the parcel. With the transfer, Horizon Center LLC would assume the protection of cultural resources located on Parcel ED-1. The deed would ensure that the fence and 100-ft buffer around the McKamey-Carmichael cemetery would continue to be maintained. Sites 40RE195 and 40RE200 would continue to be protected because they are located within the established Natural Area. In addition, these sites would continue to be inspected annually by CROET to ensure that their integrity has

not been compromised. CROET would report the results of these annual inspections in the Annual Reports prepared as part of the requirements of the MAP.

The deed between DOE and Horizon Center LLC would require that if an unanticipated discovery of cultural materials (e.g., human remains, pottery, bottles, weapon projectiles, and tools) or sites is made during any development activities, all ground-disturbing activities in the vicinity of the discovery would be halted immediately. The property owner would be responsible for contacting the TN-SHPO and the Eastern Band of Cherokee Indians Tribal Historic Preservation Office to initiate and complete consultation prior to any further disturbance of the discovery-site area.

DOE sent notification letters to the TN-SHPO and the Eastern Band of Cherokee Indians Tribal Historic Preservation Office providing them information about the proposed transfer. The TN-SHPO provided a response stating that they had no objections to the proposed transfer contingent on receipt and review of the deed restrictions specific to protection of cultural resources. These restrictions were transmitted on August 22, 2002, and a response from the TN-SHPO approving the action was received on September 5, 2002. The TN-SHPO concurred that the proposed action would not adversely affect any listed properties on the National Register of Historic Places so long as the covenant language contained in the DOE letter dated August 22, 2002, is included in the transfer documents and runs continuously with the land. Copies of the referenced correspondence are included in Appendix D.

4.4 SOCIOECONOMICS

Socioeconomic impacts of the proposed title transfer are limited to the potential revenue impacts for the City of Oak Ridge if the transferred land is sold to private, tax-paying corporations. The acreage developed and demographic and income impacts are unchanged. In addition, any improvements made to the land are taxable, whether the land is leased or owned. For Parcel ED-1, DOE currently provides the City of Oak Ridge a payment in-lieu-of-tax only for the Natural Area. The potential net change in revenue to the City would be the tax collected on the land itself, minus any lost revenues from discontinued payments in-lieu-of-tax.

This analysis assumes that the entire 957 acres would be transferred, of which 468 acres would remain as the Natural Area, and 489 acres would be sold over time for private development. Only the land sold for private development would be taxable. Unimproved industrial land in Oak Ridge has been valued from $17,000 to $35,000 per acre (FLUOR 2001). The total land value for 489 acres would fall between $8.3 million and $17.1 million, and the assessed value would fall between $3.3 million and $6.8 million. Assuming a tax rate of $2.94 per $100 of assessed value, the tax revenue for the transferred property would fall between $98,000 and $201,000. At this rate, the payment in-lieu-of-tax on the 468 acres of the Natural Area would have been about $18,300 ($5,327/acre x 468 acres x 0.25 assessment rate x $2.94/100). Upon transfer, DOE would no longer make the in-lieu-of-tax payment to the City of Oak Ridge. Therefore, the new net revenue could range from $79,300 to $182,700 ($98,000 - $18,300 to $201,000 - $18,300). However, it is not clear whether the City of Oak Ridge would be able to collect property tax on the developable acreage as long as Horizon Center LLC owns it. Actual revenues will depend on the acreage sold, tax status while owned by Horizon Center LLC, and on future land valuations, assessments, and tax rates.

5. CUMULATIVE IMPACTS

Cumulative impacts are those that may result from the incremental impacts of an action considered additively with the impacts of other past, present, and reasonably foreseeable future actions. Cumulative

impacts are considered regardless of the agency or person undertaking the other actions (40 *CFR* 1508.7), and can result from the combined or synergistic effects of individual minor actions over a period of time.

5.1 POTENTIALLY CUMULATIVE ACTIONS

This section describes present actions, as well as reasonably foreseeable future actions, that are considered pertinent to the analysis of cumulative impacts for the proposed title transfer of Parcel ED-1. The probable locations of these actions and their relationship to Parcel ED-1 are shown on Fig. 5.1. The actions are as follows.

ETTP (Heritage Center). DOE has made many of its vacant and/or underutilized facilities at the ETTP available for lease to CROET, who in turn is subleasing these facilities to private sector firms (DOE 1997b). Commercial use of these facilities does not constitute a change of the primary use of the property, which has been industrial for about 60 years. Portions of ETTP are contaminated with hazardous substances and radionuclides and DOE is responsible for environmental cleanup of the site (DOE 1997b). Recently, DOE committed (and EPA and TDEC concurred) to implement a Performance Management Plan, which will include the transfer of title of some of these facilities. In addition to the Oak Ridge Performance Management Plan, property disposal (i.e., title transfer) is being considered under E.O. 12512 "Federal Real Property Management," which mandates that each agency conduct a Utilization Study for federal property under its control.

Parcel ED-3. DOE is also considering the transfer of a parcel of land designated as Parcel ED-3 for economic development purposes. Consistent with the PMP and E.O. 12512, DOE may consider disposal (i.e., title transfer) of this parcel. Parcel ED-3 is located along portions of State Route 327 (Blair Road) and State Route 58 (Oak Ridge Turnpike). If transferred, the property would be marketed for commercial and light industrial uses. The environmental consequences of the proposed transfer of this property were reviewed in a Draft EA (DOE 2000) issued to the public on September 27, 2000. DOE is evaluating a revised footprint that is consistent with one of the alternatives evaluated as a part of the ORR Land Use Planning Process (ORNL 2002).

Roane Regional Business and Technology Park. This industrial park is located north of Interstate 40 between Buttermilk Road and the Clinch River in Roane County. The 655-acre site will include areas for industrial development and greenbelt uses. The land is characterized by rolling topography and is separated into two distinct areas by a creek. The park will be developed in three phases. Phase I development of 200 acres was completed in late 2001, and is expected to house industries that will provide about 500 jobs. Examples of the types of industries expected to locate at the site include information technology, instrumentation, automotive transportation, light metalwork, materials handling, and corporate administrative offices (Human 2000).

Pine Ridge Development. In 1969 the City of Oak Ridge acquired 230 acres of property, identified as Site X, from the then Atomic Energy Commission. The property included the current Valley Industrial Park and a portion of Pine Ridge. In 1999 the City transferred approximately 71 acres of Pine Ridge between South Illinois Avenue, Union Valley Road, and Scarboro Road to the Industrial Development Board who in turn sold the property to a private developer. The area is now being developed for office space, light manufacturing, and storage facilities. The ridge top, which has been clear-cut, is being leveled as much as 60 to 70 ft. The dirt will be used to fill a valley between the ridges and to grade the slopes, creating a plateau for the construction of up to 12 buildings with parking. Once completed, the developer expects between five and 15 tenants. The developer has also stated that he is working with both the University of Tennessee Agricultural Department and Greenways Oak Ridge on plans to revegetate and landscape the development.

Rarity Ridge Development. A private development company has proposed a mixed, residential/commercial development project for the former Boeing property in western Oak Ridge (Roane County). The developer has purchased about 1200 acres from the previous property owner and an additional 182 acres of adjoining floodplain from DOE. DOE completed an EA for the transfer of the floodplain (DOE/EA-1361) and issued a FONSI on January 31, 2001. In February 2000, the Oak Ridge City Council voted to rezone the property from industrial to mixed-use. The Rarity Ridge master plan calls for 1734 single-family homes, 133 townhouses, 2106 multi-family dwelling units, and 1,257,900 ft^2 of commercial space. Over 100 acres are planned for parks; 17 acres for active recreation and over 30 acres in preserve and limited access. In addition, approximately 440 acres will be transferred to a third party for open space and recreational purposes. Property sales are currently in progress.

West End Utility Expansion. Partners-for-Progress, a group of public and private organizations, is working to extend the utility infrastructure to make industrial sites in western Oak Ridge more attractive to prospective industries. Proposed projects include the following:

- provide water and wastewater to Horizon Center, and a new substation;
- construct a wastewater pump station and force-main, plus provide electric service to Heritage Center;
- provide utilities to the Rarity Ridge and Heritage Center sites; and
- provide utilities to the former Clinch River Breeder Reactor site.

The total cost for all projects is estimated to be $15.2 million. DOE-ORO has offered to transfer a 24-in. water line to the City and to fund water and sewer lines through CROET. The City has already begun construction on a new wastewater pumping station, a new water line, and a new force main to serve west-end development. The City is also upgrading the capacity of its sewage treatment plant.

Oak Ridge Industrial Center. The Oak Ridge Industrial Center is located at the site partially developed by TVA for the Clinch River Breeder Reactor prior to 1983. The 1245-acre property is for sale by TVA, and has been considered for development by several manufacturing industries. TVA has graded a 150-acre tract on the property to < 2% slope. The remaining land is rolling to rough terrain, having an 8 to 20% slope (ORCC 1999). The developable land contains tracts with hardwood forests and pine plantations impacted by the Southern pine beetle. The site also contains cultural resources (TVA 1988); TVA has designated a 103-acre tract bordering Grassy Creek as the Grassy Creek Habitat Protection Area to be reserved for protection of bugbane (*Cimicifuga rubifolia*) habitat (TVA 1988). A feeder road may be constructed by TDOT to improve access from SR 58, pending the sale and further industrial development of the property (ORCC 1999).

State Route 58/95 Expansion. TDOT has completed widening a 5.2-mile section of SR 58 to four lanes from the intersection with Interstate 40 to 0.5 miles south of the intersection with SR 95 (TDOT 1999). There is another project under consideration by TDOT to widen an additional 2.8 miles of SR 95 east to Westover Drive in Oak Ridge. Right-of-way plans have been developed for this project but construction funding has not yet bee approved.

Spallation Neutron Source Project. The Spallation Neutron Source (SNS) will be a state-of-the-art, high-flux, short-pulsed neutron source facility occupying about 110 acres near ORNL. The SNS will be located within the ORR on Chestnut Ridge. About 15 permanent buildings covering about 6 acres will be constructed for the project. The SNS facility will generate sub-atomic particles called neutrons for materials testing and other research. Employment to support the design and construction phases will peak in years 2001 and 2002. Operational employment would begin in 2006 and is estimated to continue for 40 years (DOE 1999b). As of October 2002, construction of the SNS has passed the halfway point and should peak in late 2002. Some components have been installed such as the Front End System. Other key facilities, including the Linac and the Storage Ring, are close to completion.

Y-12 Modernization Program. DOE has issued a Final Site-Wide Environmental Impact Statement (EIS) and Record of Decision (DOE 2001a) for the operation of the Y-12 National Security Complex (Y-12) and modernization of facilities. Major actions include construction of an Enriched Uranium Manufacturing Facility, an Assembly/Disassembly/Quality Evaluation Facility, a Depleted Uranium Operations Facility, a Lithium Operations Complex, and other facilities, as needed, to meet Y-12 mission requirements. Planning and design of these modernized facilities are in the very early stages and, thus, no detailed quantitative impacts have been assessed. However, modernized facilities would reduce radiation exposure to workers, incorporate pollution prevention/waste minimization measures in their operation, and reduce emissions to the environment compared to the facilities that are currently operating. Demolition of some facilities is ongoing in order to prepare for the new construction that should begin in 2003.

Oak Ridge National Laboratory Revitalization Project. DOE is implementing a Facilities Revitalization Project (FRP) at ORNL in order to modernize some ORNL facilities, maintain ORNL's competitive research and development capabilities, enhance worker health and safety, and reduce operating costs. The FRP includes constructing new facilities on brownfield land and remodeling numerous existing facilities in order to relocate ORNL staff currently housed at Y-12, other ORR facilities, and in commercial office space. Up to six buildings will potentially be demolished. Approximately 1.8 million ft^2 of space in aging buildings, mostly at Y-12, is being vacated.

Conceptual plans for the FRP include construction of up to 24 new facilities totaling approximately 1.2-million ft^2 in Bethel Valley near the main ORNL entrance, near the West Portal in Melton Valley, and within the footprint for the SNS. Some of the new construction is being funded by the State of Tennessee and the private sector. About 50 acres of brownfield property in Melton Valley has been transferred from DOE to the private sector in support of this proposed action. The environmental consequences of this project were reviewed in an EA and a FONSI was signed June 1, 2001 (DOE 2001b). Construction began in August 2002 on the Joint Institute for Computational Sciences, Research Office Complex, Engineering Technology Facility, and the new facility for the Mouse Genetics and Genomics Program. These facilities should be completed by September 2003.

Transuranic/Alpha Low-Level Waste Treatment Facility. DOE issued the transuranic (TRU) Waste Treatment Facility EIS (DOE 2000c) in June 2000 and its ROD on August 9, 2000. DOE has selected the Low-Temperature Drying Alternative (the preferred alternative in the Final EIS) and is proceeding with the construction, operation, and decontamination and decommissioning of the TRU Waste Treatment Facility at ORNL. The waste to be treated is legacy waste (i.e., waste generated from past isotope productions and research/development that supported national defense and energy initiatives). TRU waste generated from ongoing ORNL operations will also be treated at the facility. The facility is adjacent to the Melton Valley Storage Tanks, where the waste is currently stored. All treated TRU waste will be transported and disposed of at the Waste Isolation Pilot Plant while treated low-level waste will be transported and disposed of at the Nevada Test Site.

5.2 CUMULATIVE IMPACTS BY RESOURCE AREA

Cumulative impacts are discussed below for land use, air quality, socioeconomics, transportation, and biodiversity. Impacts primarily result from the actions presented in Sect. 5.1. The magnitude of the impacts depends on the timing of the actions (i.e., greater potential for impacts if several activities are ongoing at the same time). Several of the actions in Sect. 5.1 are unlikely to impact the proposed transfer of Parcel ED-1 (e.g., SNS, Y-12 Modernization, ORNL, TRU waste treatment) while others (e.g., proposed development of Parcel ED-3, west end utility expansion, and SR 95 expansion) have a greater potential to impact or be impacted by the proposed transfer. Because property is currently leased and is being developed for an industrial/business park, the proposed transfer of title would not have a

large incremental impact on the environment when added to the other past, present, and reasonably foreseeable future actions discussed in Sect. 5.1.

5.2.1 Land Use

Of the original 58,575 acres of land purchased in 1942 by the federal government, 24,340 acres have been conveyed and 34,235 acres remain within the ORR. The purposes that ORR land has been conveyed include: 16,855 acres for residential, commercial, and community development; 1031 acres to federal agencies and for transportation easements; 3208 acres for preservation and recreation; 3239 acres for industrial development; and 7 acres for mission-related purposes. Current land outgrants (lease/license/permit areas) include 3498 acres for preservation/recreation and 485 acres for industrial development. The title transfer of Parcel ED-1 would remove an additional 489 acres of land from the ORR that would continue to be developed into an industrial/business park. The remaining 468 acres of Parcel ED-1 would not be developed and would continue to be protected within the Natural Area. Because the total area is small compared to the remaining ORR land (< 1%), the change in land use would result in negligible cumulative land use impacts.

5.2.2 Air Quality

Although the proposed transfer of Parcel ED-1 does not appear to have the potential to bring about major impacts (e.g., major sources requiring Title V operating permits) to air quality, the overall trend in the Roane and Anderson Counties area does present such a potential. Industrial development, increased traffic, and general population growth could impact air quality.

Construction activities, although exempt from Prevention of Significant Deterioration limits in 40 *CFR* 52.21, can be a major source of emissions, particularly particulates, in the form of fugitive dust. Such sources tend to be of short duration (during the construction period) and largely result in impacts of a localized nature. For example, the proposed widening of SR 95 would produce particulate emissions during disturbance of soils, but these temporary emissions could be minimized by the application of wetting agents during dry periods. Likewise, construction activities on Parcel ED-1 could be mitigated in a similar nature.

5.2.3 Socioeconomics

Several nearby development initiatives may increase employment in the area. Major initiatives include continued reindustrialization of the ETTP (Heritage Center), proposed development of Parcel ED-3 (if approved), the SNS project at ORNL, the Roane Regional Business and Technology Park, Rarity Ridge, and potential development of the Oak Ridge Industrial Center. No information is available on the expected employment associated with developing the Oak Ridge Industrial Center or Rarity Ridge.

The cumulative employment impacts, assuming all the remaining initiatives succeed during the next 10 years, are summarized in Table 5.1. Given the large uncertainties surrounding future success of any of these initiatives, this represents an upper bound on the cumulative employment impacts. The purpose for presenting the upper bound is to determine what the maximum potential impact would be on the local economy including secondary negative and positive effects.

Direct and total employment figures were derived as follows. Parcel ED-3 and ETTP Heritage Center direct employment assumes that each of these sites meets 100% of its job creation goals. Employment for the Roane Regional Business and Technology Park is based on a 20-year development plan which estimates that up to 3500 direct jobs will be created over that time period (Human 1999). The table assumes that half of those jobs (1750) will be created in the next 10 years. Direct and total employment estimates for the SNS

Table 5.1. Estimated cumulative ROI employment impacts for local development initiatives

Parcel	Direct employment impact	Total employment impact		Percent of 2000 employment base	
		Lower bound[a]	Upper bound[b]	Lower bound	Upper bound
ED-3	1,200	2,163	3,438	0.6	0.9
ETTP	2,500	4,507	7,162	1.2	2.0
SNS	744[c]	1,704[c]	1,704[c]	N/A	0.5
Roane Regional Business and Technology Park	1,750	3,155	5,013	0.9	1.4
Cumulative impact	7,694	14,233	21,613	3.9	5.9

[a]Assumes the Regional Input-Output Modeling System (RIMS II) multiplier for miscellaneous manufacturing.
[b]Assumes RIMS II multiplier for motor vehicles and equipment.
[c]Maximum number of direct jobs and total jobs as reported in DOE 1999b.
ETTP = East Tennessee Technology Park.
ROI = Region of Influence.
SNS = Spallation Neutron Source.

are based on figures presented in the final EIS (DOE 1999b); the maximum employment in any year occurs in 2006, when the facility is expected to begin operations. Operating employment is expected to continue for 40 years. As the table shows, the cumulative impact could result in up to 21,613 direct and indirect new jobs, or an increase of 5.9% over 2000 Region of Influence (ROI) employment.

The gains in employment are likely to be offset by the large cuts in DOE-related jobs during the same time period. Between 1996 and 1999, 4457 direct jobs were lost and more jobs are expected to be lost in the next 10 years. It has been assumed that 3500 direct jobs will be lost during this period. Therefore, the cumulative direct and indirect jobs lost from 1996 to 2010 would total 10,977. When subtracted from the cumulative impacts shown above, the net new jobs created would represent between 0.9% and 2.9% of the 2000 ROI employment. This increase, created during a 10-year period, is not expected to create an undue strain on local socioeconomic resources.

5.2.4 Transportation

Cumulative transportation impacts in Roane and Anderson Counties could occur from increased development and growth. These potential impacts could be combined with ongoing and planned activities on the ORR and with the planned expansion of the state highway by TDOT.

The main transportation impacts of commercial and industrial development would be an increase in average daily traffic volumes. However, widening SR 95/58 from the west end of Oak Ridge to the intersection with Interstate 40 should help to reduce local traffic flow.

Associated with increases in traffic is the potential for an increased number of accidents, additional noise and air pollution, and accelerated road deterioration and damage. The increase in average daily traffic volumes could result in inconveniences for other vehicles (personal and commercial) on affected routes and connecting roads. Increased pavement deterioration and damage could increase costs associated with maintaining or resurfacing roads and highways. Although noise associated with increases in traffic is normally not harmful to hearing, increased traffic noise is considered by the public to be a nuisance. Increased accidents put an additional strain on local emergency response personnel. Increased vehicular traffic also has the greatest potential to increase air pollution in the local area because emissions from motor vehicles are poorly regulated. Overall, the continued development of Parcel ED-1 is expected to have little impact on traffic in the area, especially with the planned road improvement projects. It

should be noted, however, that the transfer of title of Parcel ED-1 will not create any additional transportation impact since the parcel is already being developed into an industrial/business park.

5.2.5 Biodiversity

The greatest threat to reduced biodiversity of an area or region is conversion of cover types from natural systems to completely different and maintained systems. As an example, the conversion of an upland hardwood forest to pasture or hayfield (a monoculture) use can result in nearly the same loss of biodiversity as if the woodland were converted to industrial use.

Section 5.1 identifies several projects in the Oak Ridge area that will result in a change to the area's habitat. However, measures are being taken to create and/or maintain ecosystems that will enhance biodiversity. As an example, although Parcel ED-1 is already being developed as an industrial/business park, over half of the property will not be developed and contains corridors and buffers for native vegetation and wildlife species. In addition, approximately 103 acres along Grassy Creek are being reserved for habitat protection at the Oak Ridge Industrial Center (TVA 1988), and about 61 acres of the Roane Regional Business and Technology Park are being left as a greenbelt area. The SNS project is creating wetland habitat to replace habitat lost during construction and a forested pathway will be retained along Chestnut Ridge to minimize effects on terrestrial wildlife movements (DOE 1999b). Additionally, large areas of Blackoak Ridge, McKinney Ridge, and portions of Pine Ridge are not suitable for development and provide a large area to protect ecological resources.

A recently announced regional project has the potential to mitigate many of the potentially adverse ecological impacts that could be associated with the plans for development of the western portion of the ORR. Approximately 75,000 acres in Anderson, Scott, and Campbell Counties will be managed as a multiple-use public forest under a joint agreement between The Conservation Fund (a nonprofit land trust) and Renewable Resources, Inc. (a private timber investment firm). The Conservation Fund purchased the surface rights to the property and Renewable Resources, Inc. purchased the timbering rights. The property is known as the Cumberland Forest (Simmons 2002). This project has, as one of its primary goals, the protection of rare species of the Northern Cumberland Plateau Physiographic Area. Many of the same rare species also are found within the Southern Ridge and Valley Physiographic Area that includes Parcel ED-1.

The agreement calls for Renewable Resources, Inc. to manage the forestland under restrictive covenants that ensure environmentally sound timber management that will protect the ecosystem and provide economic benefits to the surrounding region. The Conservation Fund will transfer its interest to the TWRA, possibly as a new wildlife management area to be established next to the existing Royal Blue Wildlife Management Area, which totals 50,000 acres. This acquisition links Frozen Head State Park and the Royal Blue Wildlife Management Area to create a 140,000-acre tract of public forest. Plans call for creating a 35-mile segment of the Cumberland Trail State Park within this property to link existing trail segments in Frozen Head and Royal Blue (Simmons 2002).

Growth and development in the region surrounding the ORR is putting increased pressure on the biodiversity of the Ridge and Valley Ecoregion. However, the ORR continues to be a biologically rich resource that provides protection for large land areas and the biodiversity found within those protected areas.

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APPENDIX A

TRANSFER PROPOSAL

Proposal to Transfer

1000 ± acres of

East Tennessee Technology Park's Horizon Center

to the

Community Reuse Organization of East Tennessee

February 14, 2001

Submitted by

The Community Reuse Organization of East Tennessee

Proposal to Transfer 1000± acres

of the East Tennessee Technology Park's Horizon Center

to the Community Reuse Organization of East Tennessee

for Economic Development Purposes

Pursuant to 10 CFR 770, Transfer of Real Property

at Defense Nuclear Facilities for Economic Development.

The purpose of this document is to comply with 10 CFR Part 770, Transfer of Real Property at Defense Nuclear Facilities for Economic Development, specifically Part 770.7(a) Proposal. The Community Reuse Organization of East Tennessee (CROET) proposes that the Department of Energy (DOE) transfer ownership to CROET of a 1000-acre parcel for economic development. The parcel is currently identified as that part of East Tennessee Technology Park's *Horizon Center*. On January 16, 1996, the parcel was leased to the CROET for the purpose of developing it as a mixed use industrial/business park (Exhibit A). CROET has undertaken significant development of the parcel since that time with approximately $9.5 million of investment into the park for infrastructure development (Exhibit B). Substantial background information was amassed for the lease regarding economic justification for the development of the park. In addition, an Environmental Assessment was completed prior to the lease and a "Clean Parcel" determination for this property was received from the U.S. Environmental Protection Agency on August 21, 2001 (Exhibit C).

Proposal to Transfer 1000± acres
of the East Tennessee Technology Park's Horizon Center

770.7 (a) Proposal.

770.7(a)(1) A proposal must include (but is not limited to):

770.7(a)(1)(i) A description of the real property proposed to be transferred

The parcel is a 957.16 acre tract (Exhibit D) located in the northwest section of the DOE Oak Ridge Reservation. The parcel is bound on the north by a perimeter road and the south by State Route 58/95. The 1000 acre parcel includes the area generally defined as "Natural Area," a 400 ± acre parcel that surrounds the meandering East Fork Poplar Creek (Exhibit E).

770.7(1)(a)(ii) The intended use and duration of use of the real property

CROET undertook a study prior to the lease of this parcel to ascertain the need for a regional industrial/business park and the efficacy of developing same. The study, prepared by Lockwood Greene Consulting, determined that there was a need for such a park and that it was economically feasible to build such a center. The Socioeconomic section of the environmental assessment anticipated that the park's development would have a positive impact in creating jobs. Proof positive of the need for and benefit of the park came as a result of the successful recruitment of the park's first tenant, Theragenics, Inc. Theragenics located in the park prior to the completion of the park's infrastructure, building a 100,000 + square foot state-of-the-art facility to

770.7(1)(a)(ii) - Continued

manufacture its proprietary cancer fighting Theraseeds.® The facility is located on 21 acres of property subleased from CROET through 2029. Theragenics will employ nearly 300 people when fully operational sometime during 2002-2003. CROET's lease of the 1000 acre Horizon Center from DOE runs through 2038. It is anticipated that the level of investment by CROET, the State of Tennessee and the City of Oak Ridge and the anticipated investment by private sector companies locating within the park would necessitate that the property remain as a industrial/business park indefinitely

770.7(a)(1)(iii) A description of the economic development that would be furthered by the transfer (e.g., jobs to be created or retained, improvements to be made)

CROET plans to further develop (e.g. 25% of the road and electrical systems and 75% of site grading is yet to be completed), market and fill this park with private sector industry, like but not necessarily limited to, Theragenics type companies. In order to ascertain the appropriate manner in which we should target industry types, CROET, in partnership with the City of Oak Ridge and the Oak Ridge Chamber's New Century Alliance, commissioned a study by *Fluor Global Services* (Exhibit F), one of the preeminent industrial site location firms in the world. The study identified our strengths and weaknesses and developed cluster groupings of industry types that

770.7(a)(1)(iii) - Continued

we should recruit. One of the weaknesses identified by *Fluor* was the lease of Heritage Center, noting that the lease mechanism would somewhat limit our capability to attract companies. We have had recent direct experience regarding this limitation in that *Holrob*, one of the most successful developers in the region, has after many months of negotiation, indicated that the inability to purchase a parcel in Horizon Center fee-simple will inhibit them from developing a much needed speculative building in the park (Exhibit G). While the lease mechanism does provide opportunities, fee-simple ownership by CROET is imperative for the ultimate development of the center, development that will result in as much as 4,000,000 square feet (Exhibit H) of high-technology based industrial and business development with a potential of 1100 to upwards of 6000 jobs depending on the types of industry successfully recruited.

770.7(1)(a)(iv) Information supporting the economic viability of the proposed development

The aforementioned studies by Lockwood Greene Consulting and Flour Global provide a basis for appreciating the potential for this industrial/business park, however the viability of the park has already been proven by the location of Theragenics, that company's desire to option an additional 21 acres and by the numerous inquiries from national and international site selectors, real estate professionals, and the State's Department of Economic and Community Development. The park is just in its first year of operation, yet interest continues to be strong even during an

770.7(1)(a)(iv) Economic viability - Continued

economic downturn, underscoring the park's established viability.

770.7(1)(a)(v) The consideration offered and any financial requirements

CROET requests DOE to transfer ownership of the 1000-acre parcel to CROET at less than fair market value or without consideration for the reasons stated in the Supplementary Section of the Interim Rule, Section II, Section by Section Discussion, 5. Section 770.8 (Transfer for Less Than Fair Market Value). DOE has the authority to transfer the property at less than fair market value in order to help the local communities recover from the effects of downsizing. As a result of this downsizing the region has experienced 5898 DOE related job losses during the reporting period 1994-1999. Recent reports indicate that 100's of additional jobs are currently at risk during the FY2003 Budget cycle.

Significant consideration should also be given to the considerable investment (~$9.5 million) already made by CROET and others in the infrastructure improvements made to make the park economically viable. In addition, it is anticipated that CROET will be expected to undertake expenditures for the continued monitoring and safeguarding of the environmentally sensitive areas (contained within the "Natural Area") in and around this parcel.

770.7(1)(a)(v) The consideration offered and any financial requirements - Continued

Lastly, CROET has developed a business model in which properties at the nearby Heritage Center (The former K-25 site) have been leased as part of an overall strategy to recruit private sector industries (i.e. Jobs) to the region. Some of these properties at Heritage Center are marginal and need to be upgraded in order to maintain their marketability to private sector companies. Revenue derived from the sale of parcels at Horizon Center will provide an opportunity for CROET to upgrade the Heritage properties resulting in lease rates approaching region market value which, in turn, will provide an income stream that can be used synergistically for the further development of the Horizon Center. The upgrading and/or further development of these properties will enable CROET to recruit the right types of companies - companies that can create jobs to potentially mitigate the adverse effects of those jobs being lost through DOE downsizing. For these reasons, CROET requests that the property be offered without consideration.

770.7(a)(2) The person or entity should state in the proposal whether it is or is not requesting indemnification against claims based on the release or threatened release of a hazardous substance or pollutant or contaminant resulting from DOE activities

CROET requests indemnification against claims based on the release or threatened release of hazardous substance or pollutant or contaminant resulting from DOE activities. As indicated by

770.7(a)(2) Requesting indemnification against claims - Continued

the Supplementary Section of the Interim Rule, Section II. Section by Section Discussion, 4. Section 770.7 (Transfer Process), "A proposal should explicitly state if indemnification against claims is or is not being requested, and, if requested, the specific reasons for the request."

As justification for requested indemnification, CROET cites a section of the Environmental Assessment for the 957.16 acre parcel (3.4.1 Surface water) which states, "East Fork Poplar Creek (EFPC) ... is a moderately wide ... fourth-order stream that bisects Parcel ED-1 ... EFPC originates within the Y-12 Plant, and upstream reaches have sustained considerable impacts and received substantial amounts of contamination in the more than 50-years that the Plant has operated." A recent news article in the Knoxville News Sentinel indicate that the contamination of this creek continues to be problematic (Exhibit I). Based on uncertainties regarding this stream, CROET believes it prudent to request indemnification.

A certification that the requesting party (CROET) has not caused contamination on the property is attached to this proposal (Exhibit J).

CROET

Community Reuse Organization
of East Tennessee

107 Lea Way

P.O. Box 2110

Oak Ridge, TN 37831-2110

phone: 865.482.9890

fax: 865.482.9891

www.croet.com
info@croet.com

August 19, 2002

Ms Susan Cange
AU-61
U.S. Department of Energy
P.O. Box 2002
Oak Ridge, Tennessee 37831-2002

Subject: Request to Modify the proposal to transfer Parcel ED-1 under 10 CFR Part 770.

Ms. Cange:

As you may be aware, the Community Reuse Organization of East Tennessee (CROET) has, over the past two years, reorganized its corporate structure. One of the key components of this reorganization is the creation of subsidiary companies with CROET acting as a quasi-holding company for these subsidiaries.

Currently there are three subsidiary companies, one of which is *Horizon Center, LLC*. Our intention, since the inception of these companies, has been for Parcel ED-1, whether under lease or fee-simple ownership, to reside within this subsidiary company. We have created these entities for a variety of reasons including, but not limited to, operational efficiency, enhanced mission focus and litigation protection.

With this transmittal, I am requesting that the proposal submitted in February of this year to transfer Parcel ED-1 (Horizon Center) under 10 CFR Part 770 from DOE to CROET be modified to instead transfer said parcel to the *Horizon Center, LLC.*

I understand that there may be some concern regarding Horizon Center LLC's ability to pay for commitments made on its behalf. Transferring the developable portions of Horizon Center along with the commensurate lease modification of the "natural area" to Horizon Center, LLC, will provide the wherewithal to defray the costs of monitoring and mitigation of the sensitive/natural area. As you know, Horizon Center already derives income from the subleases on the property. In the highly unlikely event that there should be a shortfall in Horizon Center, LLC revenues, we are structured in a manner that would permit sister companies to loan funds to Horizon Center, LLC.

I trust this addresses any concern you may have regarding our ability to fulfill commitments. Thank you, in advance, for your positive assistance in this matter.

Sincerely,

Lawrence T. Young
President and CEO

c: William Snyder
Robert Brown

APPENDIX D

COPIES OF CONSULTATION LETTERS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

August 21, 2001

Certified Mail
Return Receipt Requested

4WD-FFB

Susan M. Cange
Reindustrialization Liaison
Office of Assistant Manager for Environmental Management
U.S. Department of Energy
Oak Ridge Operations
P.O. Box 2001
Oak Ridge, Tennessee 37831

SUBJECT: Section 120 (h) (4) (B) determination for Parcel ED-1 at the East Tennessee Technology Park (ETTP)

Dear Ms. Cange:

Per your request, EPA has review the documentation related to the Comprehensive Environmental Response, Compensation, and Liability (CERCLA) Section 120 (h) (4) (B) clean parcel determination for Parcel ED-1 and EPA's associated concurrence. Based on the review, EPA believes the proper documentation was submitted by the Department of Energy (DOE) to support a "clean parcel" determination for parcel ED-1 excluding East Fork Poplar Creek and Bear Creek and their associated floodplains. Based on our August 2, 1995 letter (Mr. Weeks to Mr. Lingle), DOE has EPA's CERCLA Section 120 (h) (4) (B) concurrence for Parcel ED-1 excluding East Fork Poplar Creek and Bear Creek and their associated floodplains.

If you have questions concerning this matter, contact me at 404-562-8513.

Sincerely,

John Blevins
Oak Ridge Project Manager

cc: Pat Halsey, DOE-ORR
Oak Ridge SSAB
Oak Ridge LOC
Doug McCoy, TDEC
Thomas Gebhart, TDEC
Tim Fredrick, GF
Myrna Redfield, DOE-ORR
Connie Jones, EPA
Donna Perez, DOE-ORR
Jim Kopotic, DOE-ORR

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

May 24, 2002

Mr. David Allen
Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

RE: DOE, DRAFT ENVIRONMENTAL ASSESSMENT ADDENDUM, TRANSFER OF PARCEL ED-1 TO CROET, OAK RIDGE, ROANE COUNTY, TN

Dear Mr. Allen:

At your request, our office has reviewed the above-referenced draft environmental assessment addendum in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). Based on the information provided, and in accordance with our previous review of the archaeological survey of the area of potential effect, we find that the project area, as currently defined, contains no archaeological resources eligible for listing in the National Register of Historic Places.

This office has no objection to the implementation of this project. However, prior to transfer, and in accordance with our correspondence of April 29, 2002; please submit the proposed final deed restrictions to this office for our review and comment. If project plans are changed, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

Your cooperation is appreciated.

Sincerely,

Herbert L. Harper

Herbert L. Harper
Executive Director and
Deputy State Historic
Preservation Officer

HLH/jmb

OFFICIAL FILE COPY
AMESQ
Log No. 6 3093
Date Received JUN 3 2002
File Code

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

September 5, 2002

Mr. Gary S. Hartman
Oak Ridge Operations/DP-80
Post Office Box 2001
Oak Ridge, Tennessee, 37831

RE: DOE, TRANSFER/PARCEL ED-1, OAK RIDGE, ANDERSON COUNTY

Dear Mr. Hartman:

In response to your request, received on Monday, August 26, 2002, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800. You may wish to familiarize yourself with these procedures (Federal Register, December 12, 2000, pages 77698-77739) if you are unsure about the Section 106 process. You may also find additional information concerning the Section 106 process and the Tennessee SHPO's documentation requirements at www.state.tn.us/environment/hist/sect106.htm.

Based on available information, we concur that the project as currently proposed will NOT ADVERSELY AFFECT ANY NATIONAL REGISTER OF HISTORIC PLACES-LISTED PROPERTY SO LONG AS THE FOLLOWING CONDITION(S) ARE MET:

The covenant language contained as an attachment to your letter dated August 22, 2002 is made a part of the transfer document and run continuously with the land in perpetuity.

Unless project plans change, and so long as the condition is met, this office has no objectiou to the implementation of this project. Should project plans change, please contact this office to determine what additional action, if any, is necessary. Questions and comments may be directed to Joe Garrison (615) 532-1559. Your cooperation is appreciated.

Sincerely,

Herbert L. Harper
Executive Director and
Deputy State Historic
Preservation Officer

HLH/jyg

OFFICIAL FILE COPY
AMESQ
Log No. 76827
Date Received SEP 13 2002
File Code

Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

August 2, 2002

Dr. Lee A. Barclay, Ph.D.
Field Supervisor
U. S. Fish and Wildlife Service
446 Neal Street
Cookeville, Tennessee 38501

Dear Dr. Barclay;

INFORMAL CONSULTATION UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT FOR THE PROPOSED TRANSFER OF A PORTION OF PARCEL ED-1 OF THE OAK RIDGE RESERVATION TO THE COMMUNITY REUSE ORGANIZATION OF EAST TENNESSEE

As promised in our initial letter (dated April 22, 2002) and at our meeting on June 24, 2002, concerning the subject action, please find enclosed a copy of the Quit Claim Deed conditions that apply to listed species. Especially note condition (10) that is included to protect any Indiana bats that might inhabit the parcel.

In response to your letter of June 6, 2002 and our subsequent meeting, the Department of Energy (DOE) has decided to modify the proposed action to the transfer of the developable portion of the parcel only. Therefore, the Natural Area segment of the parcel is proposed to remain as it is, as a lease to Community Reuse Organization of East Tennessee (CROET) from DOE. This will allow greater control of the Natural Area by DOE and should answer your major concerns about the transfer's potential effect on listed species that could be present on the parcel. The draft Environmental Assessment Addendum and Mitigation Action Plan will be revised to reflect responses to these and other comments as part of the National Environmental Policy Act (NEPA) process.

This proposed action has great community interest and anything you could do to expedite your review and concurrence would be appreciated. If you need further information, please call me at (865) 576-0938.

Sincerely,

James L. Elmore, Ph.D.
Alternate NEPA Compliance Officer

Enclosure

cc w/enclosure:
David Allen, SE-30-1
Nancy Carnes, CC-10
Susan Cange, AU-61
Katy Kates, AD-42

Draft Quitclaim Deed Conditions to be Provided to the

Fish and Wildlife Service and State Historic Preservation Office

(4). Covenanting to the GRANTOR, its successors and assigns, the promissory right and license on the part of the GRANTEE, to permit the GRANTOR reasonable access as shown on Exhibit "A" on, over and through the property for the purposes of assuring and/or accomplishing appropriate mitigation and monitoring actions on abutting GRANTOR property.

(5). Reserving to the GRANTOR, its successors and assigns, the continuing rights to access, use, sample, and maintain GRANTOR's existing monitoring well system located on the premises. The monitoring wells and access routes to reach the wells for sampling are shown on Exhibit "A".

(6). The GRANTOR reserves an easement to itself for the right of access along the existing ingress/egress roads shown on Exhibit "A.

(7). All activities and development of the land by the GRANTEE, its successors and assigns shall 1) be consistent with those land uses analyzed in the Environmental Assessment dated April 1996 and set forth in the Addendum to the Environmental Assessment; and 2) be consistent with the GRANTEE's proposal to the GRANTOR which was approved by the GRANTOR on _____. Said land uses are set forth in Exhibit "B" to this Quitclaim Deed.

(8). Activities on the premises herein conveyed which cause a significant adverse impact to the Natural Area on GRANTOR's abutting land shall be mitigated by the GRANTEE.

(9). Any and all construction which may occur within any floodplain or floodway or which might affect a floodplain must comply with applicable Federal and State laws with respect to said construction and must be consistent with the Federal Facilities Agreement requirements.

(10). The land herein conveyed shall be used in a manner consistent with the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.). Specifically, the habitat for the endangered Indiana bat should be protected by retaining trees with exfoliating bark whenever possible. Should circumstances require cutting of those trees, they should not be cut between April 15 through September 15 unless the required processes of consultation with the Fish and Wildlife Service are followed.

(11). GRANTEE shall protect any historical and/or archaeological cultural resources which may be discovered on the premises subsequent to the date of this conveyance and shall comply with the procedures set forth in attached Exhibit "C".

(12). The GRANTEE, its successors and assigns, shall fence and protect any existing cemeteries that may be located on the property herein conveyed and said cemeteries shall remain in their same location as a separate land unit. GRANTEE shall not impede reasonable public ingress and egress to any such cemeteries.

(13). The GRANTEE, its successors and assigns, shall comply with all applicable Federal, State, and local laws and regulations with respect to any present or future development of the property herein conveyed, including, but not limited to, those laws and regulations which govern sewage disposal, facilities, water supply, and other public health requirements. All structures, facilities, and improvements requiring a water supply shall be required to be connected to an appropriate regulatory approved water system for any and all

usage. GRANTEE covenants not to extract, consume, expose, or use in any way the groundwater underlying the property or water from any streams located on the property without the prior written approval of the GRANTOR, the United States Environmental Protection Agency (EPA), and the Tennessee Department of Environment and Conservation

(14). GRANTOR holds harmless and indemnifies GRANTEE as set forth in, and subject to the limitations, terms and conditions of Exhibit "D" to this Quitclaim Deed.

(15). The GRANTOR acknowledges that the Oak Ridge Reservation has been identified as a National Priority List Site under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA). The GRANTEE acknowledges that the GRANTOR has provided it with a copy of the Oak Ridge Reservation Federal Facility Agreement (FFA) and relevant amendments entered into by the United States Environmental Protection Agency Region 4, the Tennessee Department of Environment and Conservation, and the GRANTOR effective on January 1, 1992. The GRANTEE agrees that should any conflict arise between the terms of such agreement as it presently exists or may be amended and terms of this deed, the terms of the FFA will take precedence. If the property, or any portion thereof, within this conveyance is removed from the National Priority List under CERCLA, and the Environmental Protection Agency and the Tennessee Department of Environment and Conservation agree in writing that the property, or any portion thereof, within this conveyance may be released from the terms of this condition, then this condition shall no longer apply. The GRANTOR has accomplished appropriate reviews under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended. Pursuant to CERCLA 120(h)(4)(D), the GRANTOR warrants that any response action or corrective action found to be necessary after the date of this conveyance shall be conducted by the GRANTOR. The GRANTEE, its successors and assigns, hereby grants to the GRANTOR a right

of access to the property in any case which a response action is found to be necessary or such access is necessary to carryout a response action or corrective action on adjoining property.

(17). The parties hereto intend that, other than the indemnification addressed in Condition No. 14 as further set forth in Exhibit "D" to this Quitclaim Deed, the reservations, restrictions and covenants herein, shall run with the entire parcel of land conveyed and be binding upon the GRANTEE, its successors and assigns, or any other person acquiring an interest in the property.

Department of Energy

Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

August 23, 2002

Dr. Lee A. Barclay, Ph.D.
Field Supervisor
Fish and Wildlife Service
446 Neal Street
Cookeville, Tennessee 38501

Dear Dr. Barclay:

INFORMAL CONSULTATION UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT FOR THE PROPOSED TRANSFER OF PARCEL ED-1 OF THE OAK RIDGE RESERVATION TO THE COMMUNITY REUSE ORGANIZATION OF EAST TENNESSEE

This letter is a follow-up to our phone conversation on Friday, August 16, 2002, regarding informal consultation under Section 7 of the Endangered Species Act for the proposed transfer of a portion of Parcel ED-1. The Department of Energy (DOE) has decided to transfer only the developable portions of Parcel ED-1 to Horizon Center LLC, a subsidiary of the Community Reuse Organization of East Tennessee (CROET). Ownership of the Natural Area will remain with DOE and will be leased to Horizon Center, LLC. The decision to transfer the developable portion of Parcel ED-1 was based on public and agency comments, including the comments submitted by the Fish and Wildlife Service dated June 6, 2002. The fact that DOE is retaining ownership of the Natural Area should alleviate the concerns expressed regarding its protection.

The requirement that Horizon Center, LLC monitors the Natural Area and perform mitigation, if necessary will be in the lease agreement. Although implementation of the Mitigation Action Plan will be the responsibility of Horizon Center, LLC, oversight will be provided by DOE. In addition, requirements to ensure that development activities do not adversely impact the Natural Area are included in Condition 8. If Horizon Center, LLC or any of its successors, transfers, or assigns fail to abide by the quit claim provisions of the deed then DOE and CROET may resolve the dispute subject to the dispute clause in the deed. Ultimately DOE has the right of judicial enforcement of the quit claim deed.

In response to your comment on Condition 10 in the Quitclaim deed, the text has been modified to indicate that "habitat for the endangered Indiana bat should be protected by retaining live or dead trees with exfoliating bark whenever possible." The protection of the natural area as required by Condition 8 will ensure that potential gray bat foraging habitat in the floodplain is not significantly impacted.

In consideration of all the safeguards in place to protect the natural area and any federally-listed species that might inhabit the area, DOE has determined that the proposed transfer of a portion of parcel ED-1 is not likely to adversely affect listed species. Please indicate your concurrence, if appropriate, on DOE's determination. If you have any further questions, please call me at (865)576-0938. Thank you in advance for your prompt reply.

Sincerely,

/s/ James L. Elmore, Ph.D.
Alternate NEPA Compliance Officer

cc:
David Allen, SE-30-1
Susan Cange, AU-61
Nancy Carnes, CC-10
Katy Kates, AD-42

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

September 18, 2002

Mr. James L. Elmore, Ph.D.
U.S. Department of Energy
Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, Tennessee 37831

Dear Dr. Elmore:

Thank you for your letter and enclosure of August 2, 2002, transmitting a copy of the Quit Claim deed restrictions for the proposed transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee (CROET). A conference call regarding this proposal was held between representatives of the Department of Energy (DOE) and U.S. Fish and Wildlife Service on August 16, 2002. A subsequent correspondence on this subject was received on August 23, 2002. This letter reflects the decision of DOE to only transfer the developable portions of Parcel ED-1 to CROET. All of this information is supplemental to the original Biological Assessment (BA) prepared for this proposal in 1995, and the subsequent request for informal consultation, pursuant to Section 7 of the Endangered Species Act, on April 23, 2002. U.S. Fish and Wildlife Service (Service) personnel have reviewed the information submitted and offer the following comments for consideration.

The BA and supporting information are adequate and support the conclusion of not likely to adversely affect, with which we concur. In view of this, we believe that the requirements of Section 7 of the Endangered Species Act (Act) have been fulfilled and that no further consultation is needed at this time. However, obligations under Section 7 of the Act must be reconsidered if: (1) new information reveals that the proposed action may affect listed species in a manner or to an extent not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered in this biological assessment, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

Our previous comments of June 6, 2002, regarding the Environmental Assessment (EA) Addendum, Mitigation Action Plan, the efficacy of previous CROET monitoring activities and DOE oversight on this parcel, and migratory bird issues remain valid. We would appreciate further consideration of the issues presented therein.

These constitute the comments of the U.S. Department of the Interior in accordance with provisions of the Endangered Species Act (87 Stat. 884, as amended: 16 U.S.C. 1531 et seq.), the Migratory Bird Treaty Act (16 U.S.C. 703-711), the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), and the National Environmental Policy Act (42 U.S.C. 4321-4347; 83 Stat. 852). We appreciate the opportunity to comment. Should you have any questions or need further assistance, please contact Steve Alexander of my staff at 931/528-6481, ext. 210, or via e-mail at *steven_alexander@fws.gov*.

Sincerely,

for Lee A. Barclay, Ph.D.
Field Supervisor

xc: John Owsley, TDEC, Oak Ridge
Dave McKinney, TWRA, Nashville

APPENDIX E

RESPONSES TO PUBLIC AND AGENCY COMMENTS

Responses to Public and Agency Comments on the Draft Environmental Assessment Addendum and Mitigation Action Plan for the Proposed Title Transfer of Parcel ED-1 (DOE/EA-1113-A)

April 2003

U.S. Department of Energy
Oak Ridge Operations
Oak Ridge, Tennessee

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ATTACHMENT A – COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT ADDENDUM AND MITIGATION ACTION PLAN FOR THE PROPOSED TITLE TRANSFER OF PARCEL ED-1 ..... A-1

1. INTRODUCTION

On May 17, 2002, the U.S. Department of Energy (DOE) issued a draft Environmental Assessment (EA) Addendum and revised Mitigation Action Plan (MAP), which were prepared to meet the requirements of the National Environmental Policy Act (NEPA). This action was in response to a proposal submitted to DOE by the Community Reuse Organization of East Tennessee (CROET) in February 2002, requesting the title transfer of Parcel ED-1 (also known as the Horizon Center). Under the proposed action, CROET would continue to develop Parcel ED-1 as an industrial/business park. CROET has leased the parcel from DOE since 1996; the lease became effective in 1998.

The draft EA Addendum and revised MAP were released for comment on May 17, 2002. Originally the comment period was scheduled to end on May 31, 2002. However, DOE, at the request of one organization, granted a 15-day extension of the comment period to June 14, 2002. On May 28, 2002, DOE held a public information session.

Based on the comments received, DOE decided to proceed only with the transfer of the developable portions of Parcel ED-1 to CROET. The remaining portion of the parcel that contains the Natural Area will be retained by DOE and will remain under a lease between DOE and CROET. CROET will continue to be responsible for the monitoring and mitigation requirements described in DOE's MAP.

DOE received a supplement to CROET's proposal on August 19, 2002, requesting that the developable portion of Parcel ED-1 be transferred to the Horizon Center LLC, and likewise that the lease for the Natural Area be with Horizon Center LLC. Over the past 2 years, CROET has undertaken a reorganization resulting in a tiered, multi-company organizational structure. The 41-member CROET Board of Directors and the CROET President and Chief Executive Officer preside over the CROET Holding Company that serves as a parent or quasi-holding company for the "subsidiary" companies. Each of the subsidiary companies generally corresponds to one of the major operations or activities historically within CROET's charge. As an example, Heritage Center LLC is responsible for reindustrialization activities at the East Tennessee Technology Park (ETTP). In a like manner, Horizon Center LLC manages industrialization operations at the Horizon Center.

CROET has appointed a separate Board of Directors to oversee the operations of these companies, respectively. The reorganization provides advantages for the early and full identification of opportunities and for full capitalization on both known and emerging opportunities. In this regard, the key advantage to the restructuring lies in its ability to increase the overall efficiency of CROET operations.

There is a continuing relationship between the holding company and subsidiary companies in that CROET has a number of board positions on the subsidiary board of directors. Additionally, the subsidiaries may loan funds to each other to cover any temporary shortfall experienced by one of the others. It should be noted, however, that these subsidiary companies are structurally and legally separate.

To avoid confusion and for purposes of this document, the summary of comments presented in each subsection refer to CROET while the responses, where appropriate, refer to the Horizon Center LLC.

2. PUBLIC AND AGENCY COMMENTS

Comments were provided by the state of Tennessee, two State of Tennessee departments and two divisions, one state agency, three local environmental advisory boards, CROET, one economic council, three environmental organizations, and 12 individuals. The agencies, organizations, and individuals who offered comments on the draft EA Addendum and MAP included:

- Advocates for the Oak Ridge Reservation (AFORR),
- CROET,
- East Tennessee Economic Council (ETEC),
- Environmental Quality Advisory Board (EQAB),
- Oak Ridge Reservation (ORR) Local Oversight Committee (LOC),
- ORR Local Oversight Committee – Citizens' Advisory Panel (CAP),
- State of Tennessee (TN)
- Tennessee Citizens for Wilderness Planning (TCWP),
- Tennessee Conservation League (TCL),
- Tennessee Department of Economic and Community Development (TN-DECD),
- Tennessee Department of Environment and Conservation - DOE Oversight Division (TDEC-DOE),
- TDEC Division of Natural Heritage (TDEC-DNH),
- Tennessee Wildlife Resources Agency (TWRA),
- U.S. Fish and Wildlife Service (FWS),
- David L. Coffey (Coffey),
- Douglas B. Janney, Jr. (Janney),
- Josh Johnson (Johnson),
- Joseph A. Lenhard (Lenhard),
- Robert Peelle (Peelle),
- L.O. Rabinowitz (Rabinowitz),
- William Schramm (Schramm),
- Lorene Sigal (Sigal),
- Ellen Smith (Smith),
- Edward Sonder (Sonder),
- Thomas L. Southard (Southard), and
- Warren Webb (Webb).

Original comments are provided as an attachment to this summary. Because many comments expressed similar concerns or raised similar issues, they were grouped into subject areas for the response summary. In all, there are 17 subject areas; they are presented in order based on the number of commentors for each area:

1. Transfer of the Natural Area;
2. MAP Requirements;
3. Transfer of Parcel ED-1 to CROET;
4. Effectiveness of Deed Restrictions;
5. Threatened and Endangered (T&E) Species;
6. Transfer of Development Area 4;
7. Oversight of CROET's Activities;
8. Socioeconomics;
9. Utilities;
10. Cumulative Impacts;

11. Invasive/Exotic Species;
12. NEPA Process;
13. Land Use Planning;
14. Transfer of Parcel ED-1 to an Entity other than CROET;
15. Requirements Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA);
16. Editorial Comments; and
17. Cultural Resources.

Comments not specifically related to the EA Addendum, but rather directed at DOE policy or programs other than reindustrialization or other local and regional issues, are not included in this summary as they are beyond the scope of the EA. In addition, attachments supporting comment letters were used, where applicable, in the preparation of the final EA Addendum, but specific responses may not appear in this summary.

3. SUMMARY OF COMMENTS AND RESPONSES

The following sections of this report summarize the nature of comments received by DOE according to subject area. A summary of comments is provided and is followed by a list of the commentors and DOE's response. In some cases, a reference to revisions incorporated in the final EA Addendum or MAP is included. The reader may refer to Attachment A of this report to review the complete set of comments received.

3.1 TRANSFER OF THE NATURAL AREA

3.1.1 Summary of Comments

Several commentors expressed concerns regarding the transfer of the portion of Parcel ED-1, known as the Natural Area, to CROET and strongly recommended that DOE either retain ownership; establish a conservation easement to be held by another agency or organization (e.g., TWRA or the Nature Conservancy); or transfer the land to another conservation agency or organization. It was also suggested that the Natural Area could be transferred to the City of Oak Ridge, which could then accord it "greenbelt," or a less restrictive greenbelt status.

CROET offered a different perspective maintaining that they are capable of, and should maintain, protection of the Natural Area. They pointed out that having any other entity control the Natural Area would likely affect their ability to effectively market the developable lots and control events in the Natural Area.

Three commentors stated that they either did not have any objection to, or preferred, the transfer of only the developable portion of Parcel ED-1 to CROET. Reasons ranged from the ownership of the developable portion of the parcel would improve CROET's ability to market and develop the property; the ecological significance of the Natural Area and concerns about CROET providing for the area's long-term stewardship and ecological monitoring; and that the transfer of the developable portion of the parcel to CROET is acceptable, but not the most desirable option.

Some commentors were concerned that CROET's stated mission, to promote economic development for the region, is inconsistent with requirements for ecological monitoring and the protection of the Natural Area. They also felt that, to date, CROET has not fulfilled its ecological monitoring responsibilities on Parcel ED-1 and that there is no reason to believe that CROET will undertake the necessary degree of ecological monitoring of the Natural Area once it owns the entire parcel. Commentors also were concerned that if CROET should be disbanded that the responsibility for protection and monitoring of the Natural Area would be in limbo. Another commentor stated that once all developable sites are sold to private industries, CROET would then only own the infrastructure, roadways, and the Natural Area. With no further income from land sales, there would be no source of funds to continue the specified activities.

Commentors: AFORR, CROET, EQAB, LOC, CAP, TN, TCWP, TCL, TDEC-DNH, TWRA, FWS, Johnson, Peelle, Sonder, and Webb.

3.1.2 Response

Based on the comments received, DOE has revised the proposed action to include the transfer of only the developable portions of Parcel ED-1 to Horizon Center LLC. At this time, DOE will maintain ownership and control over the Natural Area and Horizon Center LLC will lease the area. Under the lease

agreement, Horizon Center LLC will continue to be responsible for meeting the requirements of the MAP. The ultimate disposal (if any) of the Natural Area will be determined at a later date.

3.2 MITIGATION ACTION PLAN REQUIREMENTS

3.2.1 Summary of Comments

Several comments were received regarding the requirements of the MAP. Some commentors seemed to believe that the requirements were too onerous, while others thought they were too ambiguous. As an example, one commentor thought that the physical inspections should only be required on an annual basis. In addition, two comments were received stating that the MAP could be interpreted as prohibiting all activity within the Natural Area while another interpreted that except for the sensitive areas, it should be made clear that there are no restrictions on crossings through the Natural Area, particularly for the purpose of developing necessary infrastructure extensions. It was also expressed that CROET, and not their clients, should be responsible for required monitoring. On the other hand, it was suggested that the MAP needs to specify who is responsible for oversight; clearly outline specific requirements for monitoring, review, and follow-up; and make the establishment of an advisory panel mandatory. A concern was expressed that CROET has not met the requirements of the MAP and it was suggested that a mechanism be established to ensure compliance with the MAP requirements. Concerns were also expressed that too much is left to the discretion, interpretation, and "good faith effort" of CROET.

There were a few comments received specific to the terminology "pre- and post-development monitoring." It was believed that this terminology is misleading because of the current status of development on the parcel. One group suggested changing "post-development" monitoring standards to "pre-development" for those sites not already developed at Parcel ED-1.

Additional comments were received regarding other aspects of the MAP. For example, a commentor suggested that the coverage of the T&E species appears to be incomplete, and that there are omissions of formerly identified cultural resources on the map presented in the document. One commentor requested that the names and qualifications of the various individuals conducting the bird surveys be given. They also wanted to know how the analysis compares to trend analysis as described by the U.S. Geological Survey. It was also suggested that the data regarding corvids and nest parasites be presented and evaluated to determine if they could be affecting bird breeding in the area (e.g., increased nest predation). It was also suggested that the possibility of increased access of other nest predators, such as raccoons and skunks, be evaluated in the MAP.

Commentors: AFORR, CROET, CAP, EQAB, TCWP, TCL, TDEC-DOE, FWS, Lenhard, Rabinowitz, Sigal, and Webb.

3.2.2 Response

DOE convened a peer review of the existing MAP in March 2002. The Peer Review Team was comprised of biologists/ecologists and a NEPA Compliance Officer from DOE Headquarters. They recommended that the ecological data collected to date be reviewed and that revisions to the MAP be based on the results of the review. Many of the requirements, as well as the specificity in the revised MAP, are based on the Peer Review Team's recommendations.

The required physical inspections, found in Sect. 3.1.1 of the MAP, are necessary to ensure that the Natural Area is not adversely impacted from activities on the developable portions of the property. The original MAP required quarterly inspections. However, after further evaluation the frequency was

changed to three times per year. This is so the inspections can occur: (1) prior to the primary construction period; (2) during the time of flowering, nesting, and spring migrations; and (3) following the prime construction period. The text of the MAP has been reviewed to make sure that it is clear that only Horizon Center LLC, and not their clients, are responsible for the required environmental monitoring.

Use of the Natural Area will be permitted as long as that use is non-intrusive and consistent with the natural environment (e.g., walking paths). If encroachment into the Natural Area is unavoidable, it will be done in accordance with the appropriate permit requirements and regulations, and the conditions specified in the lease between DOE and Horizon Center LLC. Construction of any and all habitable structures within the Natural Area will be prohibited. Encroachment into the sensitive areas where federal or state-listed species are known to occur will be prohibited.

DOE will be responsible for the oversight and accountability of Horizon Center LLC for meeting the requirements of the MAP because the Natural Area will not be transferred and will remain under DOE ownership. Horizon Center LLC, in accordance with the terms of the lease, will be responsible for the continuation of monitoring and inspections of the Natural Area, and will provide the collected data to DOE for use in publishing annual reports. The reports will continue to be made available to the public on an annual basis. At this time, DOE has decided not to create an advisory panel. Because the Natural Area will remain under DOE ownership, DOE will use in-house resources to ensure that Horizon Center LLC is meeting the terms of their lease.

The terms “pre-development” and “post-development,” used in the original MAP, are confusing and therefore, they will not continue to be used. These terms are mentioned in the revised MAP, in Sect. 2.1, where a summary is presented of the 1997 surveys that were conducted prior to any development on Parcel ED-1 (pre-development), and the ecological monitoring that has been completed since the construction of much of the infrastructure (post-development).

The MAP addresses listed T&E species known to be present within the Natural Area and that have the most potential to be adversely impacted. Monitoring of birds (including migratory species), amphibians, benthic macroinvertebrates, and fish will continue under the revised MAP. T&E plant species on Parcel ED-1 will continue to be monitored as part of the required inspections. Sections 3.2 and 4.2 of the EA Addendum have been revised to include additional information about migratory birds, including the Cerulean Warbler.

Although more cultural resources have been identified then what is indicated on the map in the document, the Tennessee Historical Commission has indicated that based on information provided to them about the proposed action, and in accordance with their previous review of the archaeological survey of the area of potential effect, the project area contains no archaeological resources eligible for listing in the National Register of Historic Places. DOE has submitted the proposed deed restrictions for review and comment. Correspondence from the Tennessee Historical Commission is contained in Appendix B of the EA Addendum.

3.3 TRANSFER OF PARCEL ED-1 TO CROET

3.3.1 Summary of Comments

Several commentors stated their support of the proposed transfer of the entire parcel to CROET. It was stated that the transfer should occur as quickly as possible and with as few restrictions as feasible. One group commented that they have always had a concern about the “desirability of leasehold interests to the private industrial market” and that average- to major-size industrial prospects are not interested in long-term leases when fee simple holdings are available. They also stated that CROET’s ownership of

Parcel ED-1 should vastly improve its marketing success. Another commentor recognized DOE's well-founded purpose in releasing property to mitigate downsizing, and through its reindustrialization, program make land available for new business and industry.

Commentors: CROET, ETEC, TN-DECD, Coffey, Janney, Lenhard, Rabinowitz, and Southard.

3.3.2 Response

DOE agrees that fee simple ownership should improve Horizon Center LLC's marketing success to help meet the goal of the proposed action to continue and further support economic development in the region. Based on other comments received, DOE has revised the proposed action to include the transfer of only the developable portions of the parcel to Horizon Center LLC. DOE will maintain ownership and control over the Natural Area and Horizon Center LLC will lease the area and be responsible for its protection.

3.4 EFFECTIVENESS OF DEED RESTRICTIONS

3.4.1 Summary of Comments

Several commentors expressed concerns regarding the effectiveness of deed restrictions that would limit CROET's development activities and protect the Natural Area. They stated that deed restrictions are difficult and costly to enforce; that only DOE would be legally entitled to assert violation of the deed restriction; and that redress typically is restricted to re-purchase of the land and buildings at current market value. One commentor suggested that since they did not believe that deed restrictions are an effective mechanism for permanent protection, DOE should consider establishing another mechanism. Suggestions were made that the landowner be required to post a bond to ensure their future performance, or that a reversion clause be inserted into the deed that would allow return of the land to DOE if CROET should no longer exist or not meet the requirements to protect the Natural Area. A request was made that copies of the draft transfer documents be made available for public review. Some believe that these agreements are part of the NEPA action and thus subject to public comment. Another commentor wanted to know if the deed restrictions would be included/transferred to new owners when CROET land was sold.

Commentors: AFORR, CAP, EQAB, TCWP, Peelle, Sigal, and Webb.

3.4.2 Response

DOE's decision to maintain ownership of the Natural Area should alleviate some of the concerns regarding its protection. Requirements will be placed in the appropriate documents to ensure that Horizon Center LLC monitors the Natural Area and performs mitigation if necessary. In addition, restrictions are included to ensure that development activities do not adversely impact the Natural Area. DOE has considered the effectiveness of various enforcement mechanisms, such as a reversion clause or the requirement for CROET to obtain a bond, and it was determined that each of these mechanisms have various flaws that cause them to either not be practical or effective. If Horizon Center LLC or any of its successors, transferees, or assigns fails to abide by the provisions of the Quitclaim Deed, then DOE will be able to seek enforcement in Federal District Court. The conditions specified in the Quitclaim Deed will flow to new owners.

The transfer documents will be made available to the public for information once DOE Headquarters approves the 10 *Code of Federal Regulations (CFR)* Part 770 package that will sit before the Congressional committees.

3.5 THREATENED AND ENDANGERED SPECIES

3.5.1 Summary of Comments

Several comments were received regarding T&E species, particularly the Cerulean Warbler and the Tennessee dace. Commentors requested that, based on provided information, DOE revise the EA Addendum and MAP to acknowledge the presence of the Cerulean Warbler on Parcel ED-1. It was also suggested that DOE analyze impacts to Cerulean Warblers and alter the EA Addendum accordingly.

Comments received regarding the Tennessee dace were varied and, in some cases, contradictory. For example, it was stated that the apparent impact on the population in Dace Branch from a 1999 storm event is of concern and that constant vigilance, as well as advancements in the prevention of construction projects, is needed. Conversely, it was also stated that the implication that construction activities on the site were the cause of the decline of the species in Dace Branch is speculation at best. They indicated that there has been a continued decline of the dace population over the years, indicating that there may be other causal factors involved. Regardless of the cause of the decline, it was agreed that continued monitoring is needed to further evaluate the condition of the population.

One commentor expressed a concern that the Biological Assessment (BA), prepared in 1995 to support the lease of Parcel ED-1 to CROET, was inadequate and inferred that it should be reviewed.

Commentors: AFORR, TCWP, TCL, TDEC-DOE, FWS, and Smith.

3.5.2 Response

As suggested, DOE has revised Sects. 3.2 and 4.2 in the EA Addendum to provide more information about migratory bird protection and the Cerulean Warbler in particular.

With respect to the Tennessee dace, DOE provided oversight during construction activities and is confident that CROET took the necessary actions to prevent adverse impacts to Dace Branch. Construction activities in the area of Dace Branch are complete and the area has been stabilized. Continued monitoring of Dace Branch was suggested by the MAP Peer Review Team and is included in the MAP. Horizon Center LLC is committed to maintaining “best management practices” in all future construction activities on Parcel ED-1. This often involves going beyond what is required by state and local requirements in order to ensure that adverse impacts are avoided if at all possible. It should be noted that other future activities beyond Horizon Center LLC’s control (e.g., Tennessee Department of Transportation expansion of State Route 95) could adversely impact Dace Branch.

DOE has reviewed the BA that was originally prepared in September 1995. At the time the BA was completed, the gray bat and Indiana bat were both federally listed as Endangered and the Virginia spiraea was listed as Threatened. DOE reviewed the current listings for all of the species previously identified by FWS as having the potential to occur on or within the vicinity of Parcel ED-1, and determined that only the gray bat, Indiana bat, and Virginia spiraea still have official listing status.

DOE has also reviewed the Annual Reports prepared from 1997 to 2000 as part of the implementation of the MAP for the original lease of Parcel ED-1. These reports were reviewed to determine if they contained any additional information pertaining to any federally listed species or their potential habitat that may have been discovered during any of the monitoring or development that has occurred on the parcel. This review did not indicate the presence of any new listed species or habitat that had not already been addressed in the 1995 BA or the EA prepared by DOE in 1996.

Also, not included in the 1995 BA was any discussion or information on a cave that is present on Parcel ED-1 near Herrell Road in the northwest part of the parcel. The opening of the cave is located within a road ditch and is approximately 1.5 ft high by 2 ft wide. Water from the ditch drains into the opening during wet periods of the year. To date, no surveys of the cave have been conducted to determine the size of the cave or if gray or Indiana bats are present or use the cave for roosting. However, DOE is assuming that bats may be utilizing the cave and have decided to protect the cave from disturbance by including it in the Natural Area.

3.6 TRANSFER OF DEVELOPMENT AREA 4

3.6.1 Summary of Comments

The commentors suggested that the EA Addendum address the adverse environmental impacts of developing Area 4 of Parcel ED-1. They also recommended that this area be excluded from development and added to the Natural Area because the area would be affected by constructing a bridge and/or undertaking road improvements to the existing gravel road to provide suitable access. It is believed that widening and paving the existing road would result in significant fragmentation by separating the Natural Area that runs along East Fork Poplar Creek (EFPC) from McKinney Ridge, which supports the breeding of a number of bird species of conservation concern. The question is raised of how the economic value of developing this area could possibly justify the environmental impact of these actions.

Commentors: AFORR, EQAB, TCWP, TCL, Sonder, and Webb.

3.6.2 Response

Development Area 4 is currently leased to CROET, consistent with the analysis performed in the 1996 EA. The results of the evaluation were the determination that approximately 55 acres, which included this area, was suitable for development. DOE has revised the EA Addendum to address potential adverse impacts to 1) the 1.5 mile section of the North Boundary Greenway that borders a portion of Development Area 4 and 2) migratory birds that could result from future development of this area. Based on the comment received, DOE would encourage the City of Oak Ridge and Horizon Center LLC to enter into discussions regarding the continued use of the greenway. In addition, mitigative measures should be enlisted as well as improvements that may enhance the public's use of the area (e.g., include a foot/bike path as part of the road improvements).

3.7 OVERSIGHT OF CROET'S ACTIVITIES

3.7.1 Summary of Comments

A few comments were received that pertained directly to CROET. Specifically, it was recommended that there be mandatory oversight/auditing of CROET or its subsidiary corporations by the city, DOE, or an independent entity. Commentors were also concerned with the financial aspects surrounding the sale of portions of Parcel ED-1 by CROET. Specifically, questions were raised regarding how the money would be distributed and to whom.

Commentors: AFORR, CAP, TCL, Johnson, Schramm, and Webb.

3.7.2 Response

CROET, including it subsidiaries, is the DOE-recognized, community reuse organization for Oak Ridge. Community reuse organizations were established and funded by DOE to implement community transition activities under Sect. 3161 of the National Defense Authorization Act for Fiscal Year 1993 [42 *U.S. Code (U.S.C.)* 7274 h]. CROET is also a 501(c)(3) entity, and as such is subject to oversight/auditing through a number of different mechanisms. As a public entity, CROET is required to file an annual tax return (Form 990) that is a matter of public record. In addition, CROET has annual audits conducted on their financial activities and provides that information to DOE and to the Federal Audit Clearinghouse. Also, DOE will be providing oversight of monitoring/mitigation since the Natural Area will remain under DOE ownership.

Horizon Center LLC has stated that money from the sale of portions of Parcel ED-1 will be used to fund additional infrastructure construction and improvements to the property, as well as improvements to facilities currently leased at ETTP.

3.8 SOCIOECONOMICS

3.8.1 Summary of Comments

Comments were received indicating that the consideration of economic impacts in the EA Addendum is inadequate because a number of significant economic issues received no attention or evaluation. One commentor stated that the EA Addendum needed to address the effectiveness of CROET's operations to date. Another commentor felt that an evaluation was needed to determine whether future development occurring on Parcel ED-1 would be more advantageous to the community (e.g., tax revenue) under the current leasing arrangement, CROET ownership, or ownership by some other entity. A commentor also wanted to know how much CROET expects to realize on the sale of the land available for development and what the city could expect in property and other taxes from development. A request was made that dollar estimates be provided at 2-, 5-, and 10-year intervals.

One commentor indicated that more recent data on city budgets is available and should, therefore, be used. It was also suggested that Table 5.1 of the EA Addendum presents unrealistic employment projections and that this should be corrected. Another commentor stated that Sect. 5.2.3 of the EA Addendum treats employment impacts in a cavalier manner and that the historical period used for comparison should be limited, because of the unrealistically large impacts from 1943-1950.

Commentors: CAP, Peelle, Schramm, Sigal, and Webb.

3.8.2 Response

It was determined that the bounding socioeconomic impact analysis conducted for the 1996 EA was still valid for the current proposed action. This determination is based on the estimate of direct and indirect jobs created and the minor demographic changes that have occurred. However, in response to the comments received, new information pertaining to local government revenues (i.e., property and sales tax) is provided in Sect. 5.2.3 of the EA Addendum. In addition, Table 3.2 has been revised and includes the current City of Oak Ridge budget information.

The evaluation in the EA Addendum is intended to assess the potential impacts from transferring Parcel ED-1 to Horizon Center LLC versus the potential impacts that were evaluated for the leasing action in the 1996 EA. For this reason, the economic effectiveness of CROET's and Horizon Center

LLC's operations is not within the scope of the EA Addendum. Under the current lease, the City of Oak Ridge can only tax improvements made by CROET or its subleases on Parcel ED-1. Since CROET is a not-for-profit organization, they cannot be taxed. Under the proposed transfer, Horizon Center LLC would be able to sell portions of the parcel to developers and the property and improvements by the new owners would be subject to property and sales taxes. This would indicate that the proposed transfer should be more advantageous to the community (e.g., tax revenue) than the current leasing arrangement.

Socioeconomic impacts are not only important in themselves, but also for the secondary positive and negative effects they may have on the community. The estimate of the number of jobs created represents the maximum potential impact on the local economy and, therefore, the most likely to generate adverse environmental effects. The purpose is not to forecast economic activity but to make sure that reasonably foreseeable, indirect effects are appropriately identified and considered.

3.9 UTILITIES

3.9.1 Summary of Comments

Comments were received requesting clarification on the discussion of utilities that is presented in the EA Addendum. A suggestion was made to differentiate actual utility upgrade commitments from intentions that are contingent on other actions. Another suggestion is to identify the initial water source for the parcel, and the expected availability of this source until long-term connections can be completed to the city system. One commentor wanted a discussion added regarding the expected future viability of the ETTP wastewater treatment plant, since the connection to the city plant may be delayed. Also, it was suggested that alternative plans for the future development of the site should be discussed since it is dependent upon the completion of the cities "looped" service, which may or may not be implemented. Another commentor wanted to know the anticipated costs (itemized) of additional infrastructure for development of the remainder of the developable portion of Parcel ED-1. It was also requested that the natural gas connection for the parcel be shown on a figure.

Commentors: AFORR, CAP, TDEC-DOE, Peelle, and Sigal.

3.9.2 Response

In response to the comments, DOE has provided additional information in Sect. 3.4 of the EA Addendum regarding planned utility upgrades that have the potential to affect Parcel ED-1. DOE has also updated, to the extent possible, the information regarding the current DOE and City of Oak Ridge utility infrastructure. The anticipated cost for infrastructure development of Parcel ED-1 is not within the scope of the EA Addendum, since DOE will not incur those costs. Also, because of security concerns, DOE has decided to not indicate certain utility routes in the EA Addendum.

3.10 CUMULATIVE IMPACTS

3.10.1 Summary of Comments

Several comments were received that were specific to the way that cumulative impacts are addressed in the EA Addendum or to the information that was used in the cumulative impacts section. As an example, one commentor suggested that the cumulative impacts of all the activities identified in Sect. 5.1 should be evaluated against the values and missions of the ORR and not just against the transfer of Parcel ED-1. Other commentors suggested that some of the activities presented in Sect. 5.1 should be updated.

Another commentor questioned the conclusion that there would be no cumulative adverse impacts to biodiversity as a result of the proposed transfer.

Commentors: CAP, TCWP, TCL, Peelle, and Webb.

3.10.2 Response

The NEPA regulations define cumulative impact as, "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions…" The cumulative impacts of developing Parcel ED-1 into an industrial/business park were evaluated in the 1996 EA. As stated previously, the EA Addendum has been developed to evaluate the transfer option, which was identified in the 1996 EA but not evaluated. For this reason, it is not appropriate to evaluate cumulative impacts on a broader scale than what is presented. Please note that certain cumulative impacts addressed in the 1996 EA are supplemented with additional information in the EA Addendum (i.e., land use, air quality, socioeconomics, transportation, and biodiversity). As suggested, updated information has been added to Sect. 5.1 of the EA Addendum, where applicable.

DOE has concluded that the impacts of the proposed action will not adversely impact the biodiversity of the region because it is reasonable to believe that large areas of the ORR will continue to be protected and not developed either by the private sector or as part of the DOE mission.

3.11 INVASIVE/EXOTIC SPECIES

3.11.1 Summary of Comments

Comments were received that were specific to the use of invasive species on Parcel ED-1. For example, it was suggested that CROET should not be held accountable for natural succession within the natural or sensitive areas and that CROET should only be held accountable for any invasive species it is responsible for directly introducing. One commentor stated that the prohibition on using non-native grasses for landscaping should be removed, while another stated that the language in Sect. 3.1.3 of the MAP needed to more thoroughly address native plants and minimizing lawn areas. Another suggested that DOE add a discussion of increased invasive species due to development to Sects. 4 and 5.2.5 in the EA Addendum.

Commentors: AFORR, CROET, CAP, TCWP, and Lenhard.

3.11.2 Response

Horizon Center LLC will only be held accountable for natural succession within the Natural Area with respect to preventing and controlling exotic/invasive plants in areas of known sensitive plant communities. Horizon Center LLC is also encouraged to continue its efforts to prevent the introduction of non-native species on the parcel and should be commended for their efforts to date. Especially important is the continuance of including the native plant recommendations and list of plant species to avoid in Horizon Center Covenants, Conditions, and Restrictions. Horizon Center LLC is not prohibited from using non-native grasses (i.e., fescue) for landscaping. DOE only suggests that lawn areas be kept to a minimum in order to control the spread of these species into adjacent areas of natural vegetation. Sections 4 and 5.2.5 in the EA Addendum have been revised to provide additional information regarding invasive and exotic species.

3.12 NEPA PROCESS

3.12.1 Summary of Comments

Several comments were received regarding the NEPA process, including the level of NEPA analysis, the selection of alternatives, and the subsequent analysis of alternatives. Commentors stated that the proposed transfer was a major federal action significantly affecting the human environment, thus requiring an Environmental Impact Statement (EIS). One commentor requested that DOE explain what a "Draft EA Addendum" is under the NEPA regulations. The request was also made that the names of the preparers of the documents be provided.

Alternatives that commentors thought should have been included and analyzed are: extending CROET's lease for 99+ years, voiding the current lease after 10 years and then offering the parcel to all interested parties, ceding/selling a portion of the land to other entities, ceding/selling the parcel to the City of Oak Ridge, or returning the parcel to DOE management.

One commentor suggested that DOE should not rely on the 1996 EA to dismiss impacts but should evaluate unanticipated impacts that would be carried over under the proposed action, or its as yet unanalyzed alternatives. An example that was provided was that the 1996 EA and MAP did not evaluate impacts to the Natural Area, which may have occurred during the construction of the bridges, roads, and utility infrastructure.

Commentors: FWS, Peelle, Schramm, and Webb.

3.12.2 Response

After consultation with appropriate parties (e.g., coordination with DOE Headquarters), DOE has determined that the EA Addendum is the appropriate supplemental documentation for the proposed action to transfer Parcel ED-1 to Horizon Center LLC. This is because the action is primarily administrative in nature and involves going from a lease to ownership of the property. The EA Addendum updates information that was used in the 1996 EA and forms a link between that EA and the new proposed action of transfer. The transfer and the associated documentation will require the Secretary of Energy's approval and will lie before the appropriate congressional defense committees before the transfer process can be finalized. DOE does not believe that an EIS is required because the proposed transfer is not a major federal action significantly affecting the human environment. As a result of the transfer, Horizon Center LLC will continue to develop portions of Parcel ED-1 as an industrial/business park. This action was evaluated in the 1996 EA that lead to a mitigated Finding of No Significant Impact and MAP.

Since this was an addendum to the existing 1996 EA, it was appropriate that only the proposed transfer be evaluated, as it was one of the alternatives dismissed from further consideration in the 1996 EA. DOE decided to analyze this alternative in the EA Addendum because of new information presented to them that transfer of ownership was necessary to meet the purpose and need of the original EA. Although only one alternative was evaluated, it included two options (see Sect. 2 of the EA Addendum), one of which DOE has decided to implement (i.e., transfer of only the developable portions of Parcel ED-1). The "new" no action alternative presented in the EA Addendum is the continuation of the proposed action evaluated in the 1996 EA (i.e., leasing). The DOE NEPA regulations (10 *CFR* 1021) do not require that a list of preparers be included for an EA. DOE believes that the qualifications of the contractor used for the preparation of these documents were adequate for the task, and they worked under the direction provided by DOE.

Termination of the lease to offer it to other parties is not an option. CROET, and its subsidiaries, is still the DOE-recognized community reuse organization for Oak Ridge. In accordance with the DOE-issued

interim final rule, "Transfer of Real Property at Defense Nuclear Facilities for Economic Development" (10 *CFR* Part 770), CROET submitted a proposal (Sects. 770.6 and 770.7), and later updated it, requesting transfer of Parcel ED-1 and DOE is acting on that request. Furthermore, DOE believes that the transfer of Parcel ED-1 to Horizon Center LLC will help to provide for the ultimate development of the parcel in order to meet the goal of continuing and furthering DOE support of economic development in the region.

3.13 LAND USE PLANNING

3.13.1 Summary of Comments

Commentors stated that the proposed transfer of Parcel ED-1 should be considered in context of the ORR as a whole, including DOE's missions, long-term missions of other government agencies, DOE's expectations for continued downsizing, the trend to transfer land piecemeal, and the impact of such on the value and integrity of the ORR natural areas and the reservation as a whole. Commentors were in favor of a comprehensive land use plan and assessment for the ORR that includes the entire reservation. One commentor recommended that DOE prepare a comprehensive plan for the reservation, which would protect lands in perpetuity for conservation purposes and make provisions for conservation research and national security projects. Another commentor stated that transfer of ORR lands for economic development is a permanent change in status for undeveloped land and that there is no equivalent protection for the undisturbed natural areas of the reservation.

Commentors: CAP, TCWP, TWRA, and Johnson.

3.13.2 Response

A review of the present and future programmatic needs for various land areas of the ORR was conducted as part of the original decision to lease Parcel ED-1. A summary of that review process is presented in the 1996 EA. The comments pertaining to land planning are outside of the scope of the EA Addendum, which is to evaluate the potential environmental impacts of transferring portions of Parcel ED-1 to Horizon Center LLC. The impacts of ORR land transfers, the value of the ORR, and ongoing DOE-Oak Ridge Operations missions and future mission requirements are being addressed as part of the ORR Land Use Planning Process currently being conducted by Oak Ridge National Laboratory. Although this land use planning effort is focused on the northwestern portion of the ORR, it also is taking into account the cumulative impacts that various land uses for this area could have on the remainder of the reservation.

3.14 TRANSFER OF PARCEL ED-1 TO AN ENTITY OTHER THAN CROET

3.14.1 Summary of Comments

Commentors suggested that Parcel ED-1 should be transferred to the City of Oak Ridge or made available to any interested public or private sector entity. A commentor suggested that the parcel should be transferred to the city with CROET managing Horizon Center LLC under its current lease. They did not believe that the city would reject a request by CROET to sell a portion of the parcel if an attractive industry wanted to locate in Parcel ED-1 and own, rather than sub-lease, its land. It was also stated that the city has made a substantial investment of taxpayer money and that by waiving its rights to the self-sufficiency parcel, is foregoing a substantial asset. A commentor further stated that if transfer to a single entity is to be considered, a lack of interest by other parties should be clearly documented and that the documentation would go well beyond recording the Oak Ridge City Council's waiver of interest.

Commentors: CAP, Johnson, and Schramm.

3.14.2 Response

In accordance with the DOE-issued interim final rule, "Transfer of Real Property at Defense Nuclear Facilities for Economic Development" (10 *CFR* Part 770), CROET submitted a proposal (Sects. 770.6 and 770.7), and later updated it, requesting transfer of Parcel ED-1. CROET, and its subsidiaries, is the DOE-recognized, community reuse organization for Oak Ridge. [Community reuse organizations were established and funded by DOE to implement community transition activities under Sect. 3161 of the National Defense Authorization Act for Fiscal Year 1993 (42 *U.S.C.* 7274 h)]. On May 6, 2002, the city waived its self-sufficiency rights. DOE received no other requests from any other interested parties or entities, and therefore is proceeding with evaluating the transfer to Horizon Center LLC.

3.15 REQUIREMENTS UNDER THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT

3.15.1 Summary of Comments

A few comments received were specific to the listing of the ORR, including Parcel ED-1, on the National Priorities List (NPL) and the requirements under CERCLA that must be met. A commentor noted that since no CERCLA decision has been made concerning the Lower EFPC surface water and sediments, the EA Addendum should address DOE's plans to insure appropriate activities are completed in accordance with Sect. 120(h) of CERCLA. One commentor stated that indemnification of the development areas should flow with the property and that the property should be de-listed from the NPL.

Commentors: CROET, TN, and TDEC-DOE.

3.15.2 Response

In a letter dated August 21, 1995, and again on August 21, 2001, the U.S. Environmental Protection Agency (EPA) concurred with DOE's determination that Parcel ED-1 is not contaminated, with the exception of EFPC and Bear Creek and their associated floodplains (see Appendix K in the 1996 EA and Appendix D in the EA Addendum). Because DOE has decided to maintain ownership of the Natural Area, which includes EFPC and its floodplain, the only areas that will be transferred have already received a "clean parcel determination" under CERCLA Sect. 120(h)(4).

Initially DOE determined that indemnification would only be provided to Horizon Center LLC and that it would not be extended to its successors, transferees, or assigns. However, in February 2003, an amendment was passed as part of the FY 2003 Omnibus Appropriations (P.L. 108-7) that allows for extending indemnification to Horizon Center LLC's successors, transferees, or assigns. Therefore, the Quitclaim deed has been revised to allow for indemnification to run with the land. The decision to de-list Parcel ED-1 from the NPL is an EPA decision.

3.16 EDITORIAL COMMENTS

3.16.1 Summary of Comments

Commentors noted editorial errors and pointed out areas where clarification was needed.

Commentors: AFORR and CAP.

3.16.2 Response

The final EA Addendum and MAP have been reviewed for editorial errors, and corrections have been made as appropriate.

3.17 CULTURAL RESOURCES

3.17.1 Summary of Comments

A commentor suggested that DOE be more specific on how to implement the physical inspections described in Sect. 4.2 of the EA Addendum.

Commentors: TDEC-DOE.

3.17.2 Response

DOE has revised Sect. 4.2 of the EA Addendum to include more details on the inspections. This information is also provided in Sect. 3.2 of the MAP.

ATTACHMENT A

COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT ADDENDUM AND MITIGATION ACTION PLAN FOR THE PROPOSED TITLE TRANSFER OF PARCEL ED-1

Perry, Walter N

From: Ed Sonder [exs@ornl.gov]
Sent: Thursday, June 13, 2002 1:51 PM
To: NEPA (Stakeholders comments mailbox)
Subject: Parcel ED1

The Oak Ridge reservation has unusually rich bio-diversity and as such should become a permanent preserve. Removing of a few SMALL parcels from the periphery might be justified, but continuous whittling away of large areas for development will destroy the value of the reservation as a permanent natural preserve.

Therefore, as a citizen and resident of Oak Ridge I urge that the transfer to CROET of parcel ED1 be accompanied by at least the two following actions.

1) PERMANENT Natural area protection of the 531 area exclusion zone. This could be accomplished, for example, by donating a conservation easement for this zone to an organization such as the nature Conservancy.

2) The 45 acres, labeled Parcel 4, should be added to the 531 acre exclusion zone, as suggested by AFORR.

Sincerely,

Edward Sonder
102 Woodridge Lane
Oak Ridge TN 37830

Perry, Walter N

From: MarcyRReed@aol.com

Sent: Friday, June 14, 2002 1:21 PM

To: NEPA (Stakeholders comments mailbox)

Subject: Comments on Draft EA and MAP for proposed transfer of parcel ED-1

I am submitting these comments on behalf of TCWP. They are also attached as a MS Word file.

Thank you,
Marcy Reed
Executive Director
865-481-0286

Tennessee Citizens forWilderness Planning

Comments on Draft Environmental Assessment Addendum and Mitigation Action Plan for Proposed Transfer of Parcel ED-1 to the

Community Reuse Organization of East Tennessee – May 2002

Thesecomments are submitted on behalf of Tennessee Citizens for Wilderness Planning(TCWP), a 500-member, non-profit organization dedicated to protecting naturallands and waters through public ownership, legislation, and cooperation withthe private sector.

TCWPremains strongly in favor of a comprehensive land use plan and assessment forthe Oak Ridge Reservation (ORR), a plan that will include the **<i style='mso-bidi-font-style:normal'>entire**Reservation. Piece-meal development does not thoroughly evaluate cumulativeimpacts on the rich biodiversity of the ORR. Because of this, an Environmental Impact Statement or similar process isstill needed for the entire ORR. Such a plan and evaluation should includecost/benefit analysis of development initiatives on the ORR. While TCWP supports the ongoing Land UsePlanning Process that is being carried out by the Land Use Focus Group, thearea of study for this process has been limited to surplus land in thenorthwestern section of the ORR. Thus, this otherwise commendable processcannot achieve the goal of cumulative impact assessment.

1. TheAddendum includes an extensive section on cumulative impacts that enumeratescurrent and planned activities in the area. However, the perspective of thissection is only the pertinence of these actions to the single transfer of ED-1.The cumulative impacts to the value and missions of the ORR are not evaluated.In fact, in lines 12-14 of Sect. 5.2, the Addendum uses the additionalactivities to downplay the impacts of the single ED-1 transfer: "Overall, theproposed transfer of Parcel ED-1 would not have a large incremental impact onthe environment when added to the other past, present, and reasonablyforeseeable future actions discussed in Sect. 5.1." Similarly, Sect. 5.2.1 notes, "Because the total area is smallcompared to the remaining ORR land. the change in land use would result innegligible cumulative land use impacts." These statements attempt to justify continued whittling away of the ORRin small pieces without true cumulative impact assessment. This approach is aviolation of the National Environmental Policy Act.

2. Permanentprotection for the Natural Area of ED-1 is vital. Protection of this area was a primary mitigating action leadingto a Finding of No Significant Impact (FONSI) for ED-1 in 1996, and DOE isresponsible for assuring continued protection. The Environmental Assessment(EA) and Mitigation Action Plan (MAP) are extremely vague regarding how thedeed transfer would ensure this continued protection.

It is our understanding that deed restrictions aredifficult and costly to enforce. Onlythe previous owner, in this case DOE, is legally entitled to assert violationof the deed restriction, and redress typically is restricted to re-purchase ofthe lands and buildings at current market value. Under the deed-restriction scenario, DOE would need to continuemonitoring to discover any violations, take legal action against new owner(s),and bear the cost of such actions. Inaddition, deed restrictions can be subsequently dropped, as has been observedrecently with the transfer of the Boeing land.

To provide protection in perpetuity for the NaturalArea, the recommended vehicle is a fee-title-type transfer via donation of theland

to an agency or organization (e.g., The Nature Conservancy) that isequipped to manage land for conservation purposes. An acceptable alternative is donation of a conservation easementto such an entity. The land transfer oreasement should not relieve the owners of ED-1 development areas of clearlydefined and enforceable requirements to prevent damage to the Natural Area.

3. TCWPis concerned that the slow pace of leasing the development area is not beingadequately factored into assessment of impacts on the Natural Area. Section 4 of the Addendum notes that the"majority of the impacts have already occurred on the parcel as a result ofconstruction activities," whereas only 85 of the 426 acres for development havebeen disturbed to date. Considerable additional activity, with high potentialfor deleterious impacts, remains. Monitoring requirements must cover the entireperiod of construction, and monitoring procedures must specify mechanismscapable of determining that all requirements ar met.

4. Theapparent impact of siltation from an exposed construction area on thepopulation of the Tennessee Dace in Dace Branch during a 1999 storm event is ofconcern. While the Addendum conveys theexpectation that the population will recover, based on discovery of apopulation upstream from construction influence, this setback is evidence thatreliance on existing measures is not well founded and that constant vigilance,as well as advancements in the prevention of construction impacts, is needed.

5. TheMAP is vague and provides no oversight or accountability of CROET. Much is left to the discretion, interpretation,and "good faith effort" of CROET. TheMAP needs to clearly outline specific requirements, enumerate report recipientsand reviewers. and require public participation in reviews and on the advisorypanel. The advisory panel should bemandatory.

6. Languagein MAP Sect. 3.1.3 is weak with respect to native plants and minimizing lawnareas. Already non-native plants arebeing incorporated into the landscape in developed areas. Quantifiable requirements for minimizingland area disturbed at any one time are needed.

7. TCWPsupports the recommendation of the Advocates for the Oak Ridge Reservation(AFORR) to exclude the 45-acre Parcel 4 from development and add it to theNatural Area. This recommendation is based on the isolation of this parcel fromthe other development areas, which would entail the need to provide developmentaccess by constructing a bridge and/or undertaking damaging road improvement toan existing greenway. The economicvalue of developing Parcel 4 cannot possibly justify the environmental impactof these actions.

8. TCWPalso supports the AFORR recommendation to modify the MAP to include thedocumented recent presence of the Cerulean Warbler adjacent to and within theED-1 Natural Area. This species is currently listed by the State as "In Need ofManagement," and state and federal reviews for upgrading its protection statusare in progress. The presence of thisspecies and its location within the tract further support the exclusion ofParcel 4 from development.

TCWP appreciates the opportunity to convey these commentsand welcomes questions and further discussion.

Tennessee Citizens for Wilderness Planning
Comments on Draft Environmental Assessment Addendum and Mitigation Action Plan
for Proposed Transfer of Parcel ED-1 to the
Community Reuse Organization of East Tennessee – May 2002

These comments are submitted on behalf of Tennessee Citizens for Wilderness Planning (TCWP), a 500-member, non-profit organization dedicated to protecting natural lands and waters through public ownership, legislation, and cooperation with the private sector.

TCWP remains strongly in favor of a comprehensive land use plan and assessment for the Oak Ridge Reservation (ORR), a plan that will include the ***entire*** Reservation. Piece-meal development does not thoroughly evaluate cumulative impacts on the rich biodiversity of the ORR. Because of this, an Environmental Impact Statement or similar process is still needed for the entire ORR. Such a plan and evaluation should include cost/benefit analysis of development initiatives on the ORR. While TCWP supports the ongoing Land Use Planning Process that is being carried out by the Land Use Focus Group, the area of study for this process has been limited to surplus land in the northwestern section of the ORR. Thus, this otherwise commendable process cannot achieve the goal of cumulative impact assessment.

1. The Addendum includes an extensive section on cumulative impacts that enumerates current and planned activities in the area. However, the perspective of this section is only the pertinence of these actions to the single transfer of ED-1. The cumulative impacts to the value and missions of the ORR are not evaluated. In fact, in lines 12-14 of Sect. 5.2, the Addendum uses the additional activities to downplay the impacts of the single ED-1 transfer: "Overall, the proposed transfer of Parcel ED-1 would not have a large incremental impact on the environment when added to the other past, present, and reasonably foreseeable future actions discussed in Sect. 5.1." Similarly, Sect. 5.2.1 notes, "Because the total area is small compared to the remaining ORR land, the change in land use would result in negligible cumulative land use impacts." These statements attempt to justify continued whittling away of the ORR in small pieces without true cumulative impact assessment. This approach is a violation of the National Environmental Policy Act.

2. Permanent protection for the Natural Area of ED-1 is vital. Protection of this area was a primary mitigating action leading to a Finding of No Significant Impact (FONSI) for ED-1 in 1996, and DOE is responsible for assuring continued protection. The Environmental Assessment (EA) and Mitigation Action Plan (MAP) are extremely vague regarding how the deed transfer would ensure this continued protection.

   It is our understanding that deed restrictions are difficult and costly to enforce. Only the previous owner, in this case DOE, is legally entitled to assert violation of the deed restriction, and redress typically is restricted to re-purchase of the lands and buildings at current market value. Under the deed-restriction scenario, DOE would need to continue monitoring to discover any violations, take legal action against new

owner(s), and bear the cost of such actions. In addition, deed restrictions can be subsequently dropped, as has been observed recently with the transfer of the Boeing land.

To provide protection in perpetuity for the Natural Area, the recommended vehicle is a fee-title-type transfer via donation of the land to an agency or organization (e.g., The Nature Conservancy) that is equipped to manage land for conservation purposes. An acceptable alternative is donation of a conservation easement to such an entity. The land transfer or easement should not relieve the owners of ED-1 development areas of clearly defined and enforceable requirements to prevent damage to the Natural Area.

3. TCWP is concerned that the slow pace of leasing the development area is not being adequately factored into assessment of impacts on the Natural Area. Section 4 of the Addendum notes that the "majority of the impacts have already occurred on the parcel as a result of construction activities," whereas only 85 of the 426 acres for development have been disturbed to date. Considerable additional activity, with high potential for deleterious impacts, remains. Monitoring requirements must cover the entire period of construction, and monitoring procedures must specify mechanisms capable of determining that all requirements are met.

4. The apparent impact of siltation from an exposed construction area on the population of the Tennessee Dace in Dace Branch during a 1999 storm event is of concern. While the Addendum conveys the expectation that the population will recover, based on discovery of a population upstream from construction influence, this setback is evidence that reliance on existing measures is not well founded and that constant vigilance, as well as advancements in the prevention of construction impacts, is needed.

5. The MAP is vague and provides no oversight or accountability of CROET. Much is left to the discretion, interpretation, and "good faith effort" of CROET. The MAP needs to clearly outline specific requirements, enumerate report recipients and reviewers, and require public participation in reviews and on the advisory panel. The advisory panel should be mandatory.

6. Language in MAP Sect. 3.1.3 is weak with respect to native plants and minimizing lawn areas. Already non-native plants are being incorporated into the landscape in developed areas. Quantifiable requirements for minimizing land area disturbed at any one time are needed.

7. TCWP supports the recommendation of the Advocates for the Oak Ridge Reservation (AFORR) to exclude the 45-acre Parcel 4 from development and add it to the Natural Area. This recommendation is based on the isolation of this parcel from the other development areas, which would entail the need to provide development access by constructing a bridge and/or undertaking damaging road improvement to an existing

greenway. The economic value of developing Parcel 4 cannot possibly justify the environmental impact of these actions.

8. TCWP also supports the AFORR recommendation to modify the MAP to include the documented recent presence of the Cerulean Warbler adjacent to and within the ED-1 Natural Area. This species is currently listed by the State as "In Need of Management," and state and federal reviews for upgrading its protection status are in progress. The presence of this species and its location within the tract further support the exclusion of Parcel 4 from development.

TCWP appreciates the opportunity to convey these comments and welcomes questions and further discussion.

Perry, Walter N

From: Warren Webb [WebbWarren@msn.com]
Sent: Sunday, June 16, 2002 5:44 PM
To: NEPA (Stakeholders comments mailbox)
Subject: Comments on ED-1

Following below and attached as a WordPerfect file are comments on the proposed action. Please consider them in your analysis.

Comments on the "Draft EA Addendum for the Proposed Transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee" (DOE/EA-1113-A)

Submitted by: Warren Webb

228 West Tennessee Ave

Oak Ridge, TN 37830

June 13, 2002

General Comments

1. This is a major federal action significantly affecting the human environment, requiring an EIS. This is particularly so since the proposal is to transfer land, including custodianship of a sizeable natural area, to a development entity, with meaningful restrictions and enforcement provisions (deed restrictions notwithstanding). Instead, DOE has elected to issue an "EA Addendum." Please explain what is a "Draft EA Addendum" as a National Environmental Policy Act (NEPA) document under CEQ and DOE regulations. The DOE issued an EA for an action that should have been an EIS. The result of that was a "mitigated FONSI" – itself a somewhat strange creature – which has been subsequently violated (see comments below), and now we have this other strange creature. The document, whatever it is, should put this all in context for members of the public.

2. Please explain why you have evaluated only one alternative (dismissing the no action alternative) in contravention of the National Environmental Policy Act. Other reasonable alternatives are possible: ceding/selling a portion of the land to other entities; ceding/selling the parcel to the City of Oak Ridge; returning the parcel to DOE management.

3. Please explain how the original Mitigation Action Plan (MAP) transformed into the MAP that you present here. The original MAP did not allow for the roads and bridges that have been built. The Comprehensive Development Plan presented and partially implemented by CROET was not submitted for public review and was not appropriately reviewed by state agencies, as shown by your own documents.

4. The preparers are not given – although this has not been presented as an EIS (as it should have been) – it has been put out for public comment, and the public has a right to know who the preparers are and what are their qualifications.

Specific Comments

1. Section 1.1: DOE's need poses an unanswered question – would the transfer of ED-1 to CROET "help offset economic losses . . ."? Because this has been postulated in this section, it is incumbent on DOE to analyze this question in the EA. At present, it does not. Please explain.

2. Section 1.2 states (lines 18- 20) that "The MAP accomplished this by excluding areas . . .from disturbance and development . . ." In fact, two large roads/bridges were put across the "Exclusion Area." – I would call this "disturbance and development." Please explain what public and agency reviews were accomplished before undertaking these actions, and address the potential environmental impacts of such actions in the body of your report. Please also reference Annual Reports subsequent to 1998.

3. Section 2, paragraph 2 (line 11). This paragraph is based solely on CROET's alleged information to DOE, which is not supplied. Are we (the public) really supposed to believe this? Please supply the information that CROET shared with you which would help us understand the economic consequence of the action for the community.

4. Section 2, paragraph 3, lines 21 et seq. Several options are mentioned in this paragraph which should be considered as alternatives in the "EA Addendum." Transfer of the "Exclusion Area" to another entity is of particular interest. Why is this option not considered further?

5. Section 2, paragraph 4, lines 31 et seq. This paragraph states the continued development would be conducted outside of the Natural Area. How will CROET accomplish this while gaining access to Area 4? Please explain.

6. Section 2, paragraph 5, lines 36 et seq. Please explain how deed conditions would be enforced by DOE. It seems unlikely that DOE would have the resources or the motivation to enforce any deed restrictions.

7. Section 3.2, paragraph 1. You state that "development plan concepts" were "discussed" with TWRA and other entities. Although these discussions may have been "approved by DOE," that does not in itself constitute approval by agencies. Please supply discussion and agency comments to support your contention that all parties approved of this action, or, if not, what were objections or unresolved issues.

8. Section 3.3: Here you present a lot of data, because they are available. Yet you have nothing to say about it in the "Environmental Consequences" section. In the "Purpose and Need" section, you said that economic issues were paramount. Please explain how you can omit analysis of the data you present in this section in the Environmental Consequences section.

9. Section 4: almost all of two pages are devoted to the environmental consequences of this significant federal action. DOE seems to think that no other issues arise other than listed species and cultural resources. In fact, significant socioeconomic effects could arise, as well as impacts to neotropical migratory birds and other species. Statements that no further intrusions into the natural area (e.g., page 12 lines 21-22) are not convincing if CROET intends to gain access to Area 4. An alternative would be to develop the existing road on the west boundary, but this would itself further fragment forested habitat for birds and other animals and would

destroy a large portion of an existing greenway. Please add an evaluation of these eventualities.

10. Section 4, page 12, lines 28-31: The final paragraph to the introduction of Section 4 states the "DOE has determined that no additional impacts would occur with transfer of the parcel beyond those presented in . . . the 1996 EA." In fact, impacts beyond the 1996 may already have occurred or be occurring. This is because the 1996 EA, and the MAP which accompanied the "mitigated FONSI," did not contemplate the significant incursions into the then Exclusion Zone (now Natural Area) which were subsequently implemented without effective public and agency review (the Comprehensive Development Plan prepared by Lockwood Greene for CROET.) The record from Annual Reports shows that at least one agency raised issues which were never resolved. That notwithstanding, the development plan proposed two significant bridges and other roadway fragmentations of natural area corridors which have never been evaluated for impacts. Thus, DOE should not rely on the 1996 EA to dismiss impacts but should evaluate unanticipated impacts that would be carried over under the proposed action. Please explain how these subsequent inadequately reviewed effects would carry over to the proposed action, or its as yet unanalyzed alternatives.

11. Section 5.1: DOE spends almost all of three pages (more than the attention paid to Environmental Consequences) listing many other projects that may affect the proposed action. Interestingly, some analysis follows of socioeconomic impacts that may accrue from these projects (which are not evaluated in Section 4), yet no attempt is made to place this analysis relevant to the project. Without such analysis, this is simply a waste of paper. Please explain how the cumulative effects of other actions, including socioeconomic effects, would interface with this proposed action.

12. Section 5.2.5, page 20, lines 29 - 34 : These statements seem to imply that because "large areas" would remain (not a certain conclusion), the impacts of the proposed action are of no consequence and need not be evaluated. Please explain the reasoning supporting these statements.

Comments on the "Mitigation Action Plan for the Proposed Transfer of Parcel ED-2 to the Community Reuse Organization of East Tennessee, accompaning the "Draft EA Addendum for the Proposed Transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee" (DOE/EA-1113-A)

1. Please give the names and qualifications of the various individuals conducting the bird surveys from which you produced your graphs.

2. Please present a discussion of how your analysis compares to trend analysis as described b the USGS.

3. Please present the data regarding corvids and nest parasites, and evaluate how these could affect bird breeding in the area (e.g., changing from a source area to a sink area). There is also the possibility of increased access of other nest predators, such as raccoons and skunks, which has not been evaluated here or in the "EA Addendum."

Memorandum

To: David Allen, Nancy Carnes, Katy Kates

CC: File-SMC

From: Susan Cange

Date: June 19, 2002

Re: Additional Comments on DOE/EA-1113-A, EA Addendum and Mitigation Action Plan for Proposed Transfer of Parcel ED-1 to CROET

Below is a listing of additional comments submitted on the above subject document. Attached are copies of comments for your files.

1. Ed Sonder, June 13, 2002
2. Marcy R. Reed, on behalf of Tennessee Citizens for Wilderness Planning, June 14, 2002
3. Warren Webb, June 13, 2002
4. Herbert L. Harper, Executive Director and Deputy State Historic Preservation Officer, Tennessee Department of Environmental and Conservation, May 24, 2002

If you have questions, please call me at 576-0334.

Susan:af-d

Attachments: As Stated

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

May 24, 2002

Mr. David Allen
Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

RE: DOE, DRAFT ENVIRONMENTAL ASSESSMENT ADDENDUM, TRANSFER OF PARCEL ED-1 TO CROET, OAK RIDGE, ROANE COUNTY, TN

Dear Mr. Allen:

At your request, our office has reviewed the above-referenced draft environmental assessment addendum in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). Based on the information provided, and in accordance with our previous review of the archaeological survey of the area of potential effect, we find that the project area, as currently defined, contains no archaeological resources eligible for listing in the National Register of Historic Places.

This office has no objection to the implementation of this project. However, prior to transfer, and in accordance with our correspondence of April 29, 2002; please submit the proposed final deed restrictions to this office for our review and comment. If project plans are changed, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

Your cooperation is appreciated.

Sincerely,

Herbert L. Harper

Herbert L. Harper
Executive Director and
Deputy State Historic
Preservation Officer

HLH/jmb

ETEC
EAST TENNESSEE ECONOMIC COUNCIL

June 13, 2002

Mr. David Allen, SE-30
U.S. Department of Energy
P.O. Box 2001
Oak Ridge, Tennessee 37831-2001

Subject: Comments Regarding the Environmental Assessment Addendum for Parcel ED-1

Dear Mr. Allen:

I have read with great interest the Environmental Assessment Addendum for Parcel ED-1 and would like to make the following comments.

The site should be transferred to the Community Reuse Organization of East Tennessee (CROET) as quickly as possible and with as few restrictions as possible. The development of ED-1, the related environmental issues and this transfer have been well publicized to a broad and diverse audience. The DOE effort for expeditious transfer of the property with adequate review should be applauded.

The purpose of the transfer is equally clear. It is essential that the area have a strong industrial base that augments and supports the existing DOE missions, and helps the region lessen the region's economic dependence on the Department of Energy's annual appropriations. That requires first class industrial facilities like those on Parcel ED-1 and ongoing partnerships between the Department and the community on a number of related activities.

We believe that the requirements for environmental monitoring should be simplified. The ultimate users of the park, new industries to our region, should be guided by the zoning codes of the community and the development covenants incorporated into the center's by-laws. Each requires protections of the environment and development of quality spaces.

The mission of the CROET is to bring in new companies and jobs to the region. The requirements within the Addendum seem to force the organization to become something that it is not, and mandate expenses not covered in the organization's mission. If taken to an extreme, the requirements regarding environmental monitoring and stewardship could make the mission of CROET impossible. We believe that all requirements that are not absolutely essential to the maintenance of the few threatened or endangered species on the site be removed.

Thank you for the opportunity of commenting on this most important issue.

Sincerely,

Jim Campbell
President, East Tennessee Economic Council

EAST TENNESSEE ECONOMIC COUNCIL
P.O. Box 5057, Oak Ridge, TN 37831 | Office location: 40 New York Avenue | Phone: 865.483.3047 | Fax: 865.482.0191 | Email: info@eteconline.org

CROET

Community Rehab Organization of East Tennessee

107 Iris Way

P.O. Box 2110

Oak Ridge, TN 37831-2110

phone: 865.482.9090

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infowcroet.com

A FACSIMILE TRANSMITTAL

DATE: 6-13-02

TO: David Allen **FAX:** 576-0746

FROM: Andrea

SUBJECT: EA for Parcel ED-1

NO. OF PAGES (INCLUDING THIS SHEET) IS: 6

COMMENTS:

\\FS1\SHARE\FORMS\BLANK FAX SHEET.WPD

David R. Allen
U.S. Department of Energy
SE-30-1
P.O. Box 2001
Oak Ridge, TN 37831

The following are my comments on the Parcel ED-1 documents;

Environmental Assessment Addendum

- Please provide copies of the deed and transfer agreement to interested stakeholders. The ED-1 documents must not be finalized and the transfer of the property to CROET must not be completed until stakeholders have had the opportunity to review and comment on the deed and transfer agreement. The agreement is part of the NEPA action and thus subject to public comment.
- What is the "regulatory process" (p 12 of the MAP) that enforces the deed restrictions and transfer agreement. PLEASE DESCRIBE
- Who is responsible for ensuring protection of natural, historic, and archaeological resources if CROET ceases to exist. Please discuss options.
- Will deed restrictions be included/transferred to new owners when CROET lands are sold?

- Who is responsible for oversight of new owners activities and their potential impact on the natural, historic, and archaeological resources?

- Who is responsible for development of infrastructure following transfer of ownership to CROET?

- How much does CROET expect to realize on the sale of the 426 acres of land available for development?

- What are the anticipated costs of additional infrastructure for development of the 426 acres? Please itemize.

- What can the city expect in property and other taxes from development? Please provide estimates of dollar amounts at 2, 5, and 10 year intervals.

With regard to the Mitigation Action Plan (MAP):

- When property is sold by CROET who is responsible for MAP monitoring/reports?

- Who is responsible for oversight of the MAP requirements?

- Will MAP reports be available to the public?
- Will the public be informed of the availability and location of MAP reports? Please note location of reports.
- Where and when will the public find CROET's plans for "... continuing to preserve and maintain the integrity of the Natural Area" (page 11 of the MAP)?

Thank you for your attention to these concerns.

Lorene L. Sigal
112 Parma Road
Oak Ridge, TN 37830

Tel. and FAX 482-4125

Note: While the EA Addendum (page 6) states that "... no other parcels of sufficient size and contiguity were available on the ORR to meet the requirements for an industrial park.", this statement is misleading because there are other large tracts of industrial land adjoining/near the ORR (e.g., the TVA "Breeder Reactor" land, Roane Regional Business & Technology Park).

Comment on the May 2002 Environmental Assessment Addendum for the Proposed Transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee

June 14, 2002
Robert Peelle, 130 Oklahoma Avenue, Oak Ridge, TN 37830

SUMMARY: The proposed action involves a significant chunk of the present reservation, and is an environmentally important federal action! Its assessment must be treated seriously.

The mitigation of environmental degradation of the "exclusion" or "natural" area of ED-1 is unlikely to be effective over the life of the Horizon Center industrial park because of the general ineffectiveness of deed restrictions over extended periods. Also, under plausible circumstances local employment might be reduced by the proposed action.

These difficulties would be ameliorated if the CROET lease period were instead extended to 99+ years. However, if the property is to be transferred to CROET, land not yet sold should revert to the Department of Energy in case CROET should ever demise or fail to care for or utilize the land as agreed at the time of transfer. In any case, the Natural Area portion should not be transferred to any economic development group.

The transfer of ED-1 has quite different environmental consequences from the current lease program, since the large tract of largely open land will permanently reduce the productivity of the nearby woodland and stimulate the spread of open-land pests such as the fire ant. The EA Amendment for the proposed transfer should recognize this long term difference

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COMMENTS on the Proposed Actions that require EA Amendment analysis

Figure 1.1 of the EA Amendment illustrates what a large area is being considered, and by inference the importance of any decision on transfer. Text of the draft suggests, tacitly in most cases, that the matter being considered is not very important! The eventual extent of the cleared land will affect life in all the surrounding lands and make the reservation less of a unique area. The pesky species found on cleared land will benefit. Will economic or other benefits outweigh this loss? The effective permanence of a land transfer places the decision in bold relief.

The desirability of the subject project is based in part on assumptions that:
(1) the site is surplus to DOE's future needs,
(2) CROET is eligible to receive priority for below-market land transfer from the DOE,

(3)the site will attract firms that will provide substantial employment and tax base increments,

(4) CROET will prosper sufficiently to enable it to carry out its environmental responsibilities under the land transfer agreement,

(5) the DOE will diligently enforce "deed restrictions" to protect the Natural Area as described in the EA Amendment, and

(6) future title transfers (from CROET) will include the same restrictions and be enforced.

The validity of each of these assumptions is in doubt, or at least the validity is not demonstrated in the EA Amendment. The last three seem important to this assessment and must be discussed. Assumption (3) is pertinent because, if little business locates in ED-1, the small benefit could not outweigh the stated environmental costs. [Data must exist on how frequently well executed industrial parks are unsuccessful.] Assumption (2) need not be discussed in this EA, but the reference to the transfer authority should be specific for an organization such as CROET. Assumption (1) appears to be outside an EA analysis, except for the possibility discussed in the next paragraph.

Energy sufficiency will remain a serious concern in our country, so energy research, development, and demonstration projects will continue to be placed on federal lands from time to time. Transfer of ED-1 may preclude a substantial federal project that otherwise would use this site. Unless ED-1 sales to business and industry are brisk, these businesses might produce less economic value than the federal project. Thus, the socioeconomic effect of the ED-1 transfer could in the end be negative! The DOE determination that the land is surplus was necessarily based on known or explicitly considered programmatic demands, while the projects that will seem imperative by 2020 are unknown now even to futurists. The alternative of leasing ED-1 to CROET for 99+ years should be considered in the EA.

The EA assumes that restrictions within the deed transferring ED-1 to CROET can assure long-term protection of the Natural Area now excluded from development. I believe this protection is illusory for the reasons below:

a. Long term, CROET or its successors cannot give priority to a function that may sometimes conflict with the economic development mission.

b. The costs of monitoring and protecting the 531-acre Natural Area will seem considerable when land sales are slow. The financial structure and prospects of CROET must be considered in the EA Amendment, and are much more important to the present issue than city or county finances. While current CROET management surely intends to fulfill any transfer agreement, the foundation of CROET in federal grants could place their future in jeopardy.

c. The Register of Deeds office does not enforce deed restrictions! DOE or successor agencies would have to enforce these restrictions consistently. This housekeeping responsibility is not likely to be given priority for long.

d. Should CROET demise, the efficacy of deed restrictions is further questioned. Following a second land transfer such restrictions have not generally proved effective. (Mary English, UT EERC, 1999)

Since deed restrictions cannot assure performance, DOE should pursue one of the following alternatives if the developable acreage is to be transferred:

a. DOE should retain at least the 531 acre Natural Area. [Why would CROET risk owning the East Fork Poplar Creek flood plain with the CERCLA liabilities that would occur if contamination from Y-12 is discovered there?] Preferably, DOE should further reduce negative impacts by retaining some or all of the land CROET has not yet disturbed.

b. Transfer the Natural Area to an agency or organization involved with land conservation or a related goal like wildlife management.

c. Make all land transfers to CROET with a reversion clause that would return the land to DOE or the successor agency if CROET should demise, not meet the restrictions on the natural area, or fail to carry out its stated goals. (for example, by proposing to sell ED-1 for a water park.)

The EA must recognize the limited effectiveness of deed restrictions and the environmental consequences of these limitations.]

My own perusal of the MAP for the transfer to CROET shows it is intended carefully to prevent significant adverse environmental impacts of the transfer. However, I believe experience over the country has shown that over time deed restrictions, easements, and similar instrument are often unenforceable. I therefore believe that following this plan would preclude issuance of a Finding of No Significant Impact for the transfer. Early implementation of transfer of the developable land requires another mechanism.

I believe using a reversion clause is the most reliable, next to substituting a 99+ year lease. Research on the effectiveness of reversion clauses is warranted.

Comment on EA details that require little analysis.

At the beginning of section 3.4.2 it is unclear what the initial water source for ED-1 would be, and the expected availability of this source until long -term connections can be completed to the city system.

In 3.4.3, a statement is needed about the expected future viability of the ETTP wastewater plant, since the connection to Oak Ridge municipal plant may be long delayed. Are industries that would require pretreatment of waste excluded from ED-1?

The EA Amendment in section 4 does not yet cover the environmental damage incident to the bridges over the creek. Will the MAP control such damage?

In section 5.1, discussions about Rarity Ridge, Rt. 58 expansion, and perhaps others need to be updated.

Section 5.2.3 treats employment impacts in a cavalier manner. The conclusion as stated is likely correct (growth rate within historical limits), but that is very small

comfort. Socioeconomic impacts were very large 1943-50. Better limit the historical period for the comparison.

Robert Pavlik
483-8974

DAVID L. COFFEY

122 CALDWELL DRIVE OAK RIDGE, TENNESSEE 37830
TELEPHONE OR FAX 423-483-6487 E-MAIL: 76226.1622@COMPUSERVE.COM

June 17, 2002

Mr. David Allen, SE-30
U. S. Department of Energy
P. O. Box 2001
Oak Ridge, TN 37830-2001

Dear Mr. Allen:

I appreciate this opportunity to comment on the Environmental Assessment Addendum for Parcel ED-1.

Your actions toward transferring this parcel to the Community Reuse Organization of East Tennessee are very much in keeping with the intent of Congress to alleviate economic impacts from federal government downsizing in East Tennessee.

Toward that end, I believe it is important to minimize restrictions and the appearance that this property will be an ongoing environmental research laboratory. Certainly we have many hundreds of acres in the western Oak Ridge area already devoted to those activities.

From my own industry experience I feel strongly that any hint that this industrial site would be treated as an ORNL environmental study area would be reason enough for a prospect to search elsewhere.

This is not to suggest that environmental restrictions should be relaxed. There are adequate controls in law and regulations to assure respect for the land, water and air.

However, it would be absurd to meddle in the affairs of a prospect by specifying overly restrictive landscape and access limits. Rather, we should encourage the area to be developed as a park-like setting for responsible corporate citizens.

Parcel ED-1 has been thoroughly monitored throughout its development. I trust that you will do all that you can to allow it now to become a successful industrial site.

Sincerely,

David L. Coffey

David L. Coffey
CROET Chairman

CROET

Community Reuse Organization
of East Tennessee

107 Lea Way

P.O. Box 2110

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info@croet.com

June 13, 2002

Mr. David Allen, SE-30
U.S. Department of Energy
P.O. Box 2001
Oak Ridge, Tennessee 37831-2001

Subject: Comments Regarding the Environmental Assessment Addendum for Parcel ED-1

Dear Mr. Allen:

I have read with great interest the Environmental Assessment Addendum for Parcel ED-1 and would like to make the following comments.

First and foremost, the site should be transferred to our organization as expeditiously as possible and with as few constraints on its use as possible. The community and surrounding region are dependent upon the development of the park as a means of mitigating the ongoing reorganization and attendant job loss within the Oak Ridge Federal complex.

Towards that end, the development areas should be provided with transferable indemnification and should be transferred as a de-listed property under Superfund designation.

We have done an exceptional job of maintaining and even enhancing the environmental resources of the park while under our stewardship over the past 6 years. The existing Environmental Assessment for this parcel resulted in monitoring efforts during this time, which have shown, during the most intensive development period of the park, that there have been no adverse impacts. This should indicate that we will continue to be exceptional stewards and that continued long term monitoring is unnecessary.

The nearly 500 acres of natural area provides a significant buffer for any threatened or endangered species and should preclude the necessity for extensive on-going monitoring and inspections of these areas.

The required inspections are redundant and unnecessary and should be required only on an annual basis and should end after 3 years.

CROET should not be held accountable for natural succession within the natural or sensitive areas.

CROET should only be held accountable for any invasive species it is responsible for directly introducing.

The document is written in a manner that could be interpreted as prohibiting activity within the Natural area. Save for the sensitive areas, it should be made clear that there are no restrictions on crossings through the natural area, particularly for the purpose of developing necessary infrastructure extensions.

The prohibition on using non-native grasses for landscaping should be removed.

According to published reports, there are those who would suggest that the natural areas be transferred to an entity other than CROET. It is imperative that the parcel be transferred to CROET in its entirety. This is the only way in which CROET can provide any assurance that the integrity of the sensitive and natural areas will be maintained. Having any other entity control those areas without CROET's complete concurrence would result in a potentially confrontational and unworkable situation that would likely damage our ability to effectively market the developable lots and moreover, to control events within the natural area. As we are responsible, under the current EA and the proposed amended document, for mitigating these areas, should some unforseen damage occur, having the areas in the control of others is simply unworkable.

We are particularly pleased that DOE has recognized our historic stewardship of this site and proposes that CROET oversee the continued protection of the environmental resources and that we do so without some arbitrary external over-site. As you know, CROET has an extremely inclusive board of directors of 42 individuals that represent collectively, virtually every stakeholder in the region. Our Board meetings are open to the public and there is an opportunity at these meetings for the public at large to comment on any issue relating to CROET. In addition, the meetings are regularly reported on by the news media. It is our intent to report the findings of the continued monitoring of the ecological resources to the Board annually. In this manner, all stakeholders in the region and indeed, nationally, will have either representational or direct access to our ongoing activities.

Lastly, perhaps more than anyone, we recognize the value of the natural area from a ecological and marketability perspective. We have demonstrated our ability and willingness to protect important environmental resources while simultaneously developing a seemingly incongruent adjacent land use. We have done so because it is the right thing to do and because it was a good

business decision. The natural area is a key component of our ability to sell the park's developed property to targeted upscale businesses that place high value on aesthetic features such as the stream, the hardwoods and even the fauna. To not protect this resource would be folly.

Thank you for the opportunity of commenting on an item critical to the future of Oak Ridge and our organization.

Sincerely,

Lawrence T. Young
President and CEO

Advocates for the Oak Ridge Reservation
112 Newcrest Lane
Oak Ridge, Tennessee 37830

June 9, 2002

Mr. David Allen
United States Department of Energy
Oak Ridge Operations Office
200 Administration Road
P.O. Box 2001
Oak Ridge, Tennessee 37831

Dear Mr. Allen:

The Advocates for the Oak Ridge Reservation (AFORR) are pleased to offer the enclosed comments to the U. S. Department of Energy concerning the proposed transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee.

The enclosed comments are our combined reactions to both the EA Addendum and the corresponding Mitigation Action Plan, entitled, "National Environmental Policy Act Environmental Assessment Addendum and Mitigation Action Plan for the Proposed Transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee."

Sincerely,

J. Devereux Joslin

J. Devereux Joslin
President
Advocates for the Oak Ridge Reservation
112 Newcrest Lane
Oak Ridge, TN 37830

Enclosure

Comments on DOE/EA-1113-A Draft May 2002 "Environmental Assessment Addendum and Mitigation Action Plan for the Proposed Transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee"

1. DOE needs to provide an effective mechanism for protecting the exclusion zone.

AFORR's primary concern with this assessment stems from the total absence of specificity in the report concerning how protection will be achieved for the existing "Natural Area" or "Exclusion Zone" mandated in the original Mitigation Action Plan. The current addendum simply states, "Conditions of the deed and transfer agreement would ensure that CROET continued to provide protection..." But the assessment never states how this will be accomplished.

We infer (from the text of the draft EA Addendum and draft revised MAP) that DOE intends to institute a deed restriction to prohibit future owners from encroaching upon the Exclusion Zone. We have serious concerns about this approach. A deed restriction is not an effective mechanism to accomplish the objective of permanent protection. Deed restrictions generally can be enforced only by the seller (i.e., DOE) taking the property back. No one else can enforce the restriction, and there are no less momentous mechanisms of enforcement. We think that it would be cumbersome for DOE to continue to monitor the situation for violations and we think that DOE would be unlikely to have the will or the resources to act to reclaim the property, particularly if it was necessary to compensate the owner for the current commercial value of the land and improvements, particularly if the violation is not one of major proportions. A deed restriction would not be an effective mechanism for protecting the area.

RECOMMENDATION:

AFORR's primary concern with this proposed action is the need for an effective mechanism to ensure protection for the existing "Natural Area" or "Exclusion Zone," mandated in the original Finding of No Significant Impact (FONSI) and Mitigation Action Plan (MAP) as one of the main mitigation measures necessary for the FONSI.

The most effective immediate alternative would be retention of ownership by DOE, with the establishment of a Conservation Easement over the Exclusion Zone, with monitoring and management to be conducted under an appropriate arrangement.

Eventually, DOE could choose to transfer the entire Natural Area to an agency or organization that is equipped to manage it for conservation purposes. This is only fitting since conservation of natural and cultural resources was the original reason for setting up this zone in the original NEPA document (see 10 CFR 1021.331).

2. DOE needs to provide enforceable mechanism to ensure that private owners will fulfill their obligations to meet mitigation commitments

In addition to ensuring that development does not encroach on the Exclusion Zone, AFORR is concerned about the need for an enforceable mechanism to ensure that CROET or its successors fulfill their obligations for environmental monitoring and other

management actions required under the FONSI and MAP. The FONSI was conditioned on continued monitoring and other continuing actions to protect site streams and other natural resources, and AFORR believes that the FONSI requires that DOE establish a mechanism to ensure that these actions are carried out. For example, the landowner could be required to post a bond to ensure its future performance.

3. Monitoring done to date should not be represented as "Post-Development," and monitoring should be required to continue until development is complete.

We find the representation of the currently presented monitoring data as a "Summary of Pre- and Post-Development Monitoring (1996-2000)" (Page 5) to be misleading. The goals of The Mitigation Action Plan were "pre- and post-construction assessment of natural succession and impacts of development on natural communities and populations using data collected during monitoring,"

It is clear from the description of construction activities that have taken place to date (see text and Fig 1.2.) that less than 85 acres of the 426 acres designated for developed have been disturbed. Since only about 20 to 25% of the area has been disturbed in the initial 6 years since the site was established, it is clear that any monitoring data collected so far has very little meaning with regard to evaluating the impact of development.

RECOMMENDATION:

To meet the mitigation requirements in the original FONSI and MAP, DOE must ensure a continuing commitment to monitoring during the remainder of the development process and after development is complete. The MAP should spell out clearly what the commitment to future monitoring will be. The purpose of monitoring is (a) to determine the impact of development on natural resources and (b) to determine if future mitigative action will be needed. Clearly, final determinations on these points this cannot be made until after construction activity is completed, but the current MAP does not provide for this to be done.

4. DOE needs to establish accountability for future monitoring and mitigation by CROET

The section on page 12, "4. Map Review and Reporting Requirements," clearly spells out when CROET will review the MAP. But this requirement specifies virtually no real actions that must occur at these times. The description even admits that "review could be nothing more than re-reading the MAP to determine if changes are necessary." In fact, there seem to be no requirements in this portion of the plan at all that demand serious accountability.

There is at the bottom of page 12 mention of an "optional" Peer Review Panel, which CROET has complete discretion concerning its establishment. The current

suggested make-up is entirely of governmental agencies, that may or may not have any vested interest in seeing that natural and cultural resources be fully protected.

The CROET lacks institutional expertise on conservation. It operates as a private entity without representative public involvement or oversight, and it has failed in the past to follow some mitigation requirements. Two examples of CROET's failings are the unilateral termination of monitoring after 2000 and the planting of tall fescue, listed as an invasive exotic species in Tennessee, instead of alternative grasses specified in the MAP. Therefore, it is imperative that external review and oversight of mitigation be made a mandatory condition of the transfer, not an optional item.

RECOMMENDATION:

AFORR is concerned that the requirements for MAP review and follow-up are vague and that there are no provisions to assure that CROET fulfills its obligations to mitigation. Requirements for monitoring, review, and follow-up should be made explicit and should include external oversight. We recommend that MAP review and reporting requirements be clearly spelled out. Further, oversight of CROET in MAP Review and Report should be a stated requirement in this document. Finally, this panel should allow for citizen input, especially from representatives of non-governmental organizations that are concerned about natural and cultural resources.

5. The EA and MAP do not acknowledge or address the adverse environmental impacts of developing 'Development Area 4" of Parcel ED-1. This omission must be corrected, and we recommend that this area be excluded from the proposed transfer and from development under the existing lease.

"Development Area 4," at the extreme southwest end of Parcel ED-1 (identified in Figure 1.1 of the MAP) is isolated from the rest of ED-1 and separated from the rest of the development by East Fork Poplar Creek and Exclusion Zone areas. The EA does not discuss either how road and utility access could be established to this area or the environmental impacts of such infrastructure development, and the MAP does not discuss measures to mitigate these impacts.

AFORR is concerned that the development of this 45-acre tract could have environmental costs in excess of any economic benefits. We see three possible ways to develop access to this parcel: (1) cut yet another roadway through the Exclusion Zone and build yet another bridge across East Fork Poplar Creek and through its floodplain, (2) develop an access corridor from Blair Road on the southwest, crossing the Tennessee Valley Authority (TVA) property and Poplar Creek. or (3) convert the existing one-lane gravel access road (currently open to the public as a portion of the Oak Ridge North Boundary Greenway Trail) that winds through the Oak Ridge Reservation between McKinney Ridge and East Fork Poplar Creek into a highway.

All of these access methods would have significant environmental and economic costs. Option 1, a new bridge, would be expensive and would further fragment the

Natural Area, which has already been fragmented by two other 4-lane roadways and bridges. Construction would cause additional disturbance to the forested area along the creek in the Natural Area and to the waters of the creek. The second option, developing an access corridor across TVA property and Poplar Creek, would require an even larger bridge than the first option, and would require TVA's cooperation.

Option 3, widening and paving the gravel road, would also result in significant fragmentation, by separating the entire Natural Area along the creek from the hundreds of undisturbed acres on McKinney Ridge. The convergence of this Natural Area and McKinney Ridge currently supports the breeding of a number of bird species of conservation concern, according to breeding bird surveys conducted by Partners and Flight and the Tennessee Wildlife Research Agency Partners in Flight along this trail over the past seven years. The area immediately adjacent to this particular portion of the trail has year after year been demonstrated to contain breeding grounds for no less than six bird species that are on Partners in Flight National Watch List—Cerulean Warbler (*Dendroica cerulea*), Wood Thrush (*Hylocichla mustelina*), Kentucky Warbler (*Oporornis formosus*), Prairie Warbler (*Dendroica discolor*), Blue-winged Warbler (*Vermivora pinus*), and Prothonotary Warbler (*Protonaria citrea*). Concern for the Cerulean Warbler is particularly high nationwide (see 6. below). Furthermore, disturbance of this trail would lead to the loss of additional Oak Ridge Reservation land and a popular section of the 6-mile North Boundary Greenway trail, used for hiking, bicycling, birdwatching, and other recreation.

RECOMMENDATION:

DOE should revise the EA to address the impacts of developing access to Development Area 4, in view of new information that has surfaced, and new decisions that have been made, since the original ED-1 EA. Furthermore, in view of the magnitude of the environmental impacts that we expect to be associated with developing this area, we ask that (1) this area and adjacent exclusion areas be excluded from the proposed transfer action and (2) the MAP be amended to exclude this area from development under the existing lease with CROET.

6. DOE should revise the EA to acknowledge the presence of the Cerulean Warbler on Parcel ED-1 and should revise the Mitigation Action Plan to prevent adverse impacts to this species.

Among the purposes of the Addendum are to "2. Determine if changes to the MAP are warranted..." and "3...defining when mitigation is necessary." One piece of information—that is not mentioned in the original MAP six years ago nor in either document here—is the well-documented presence of the Cerulean Warbler on the edge and within the ED-1 Exclusion Zone for four years in a row during the breeding season. This species is already state-listed as "In Need of Management," and upgrading its state status to "threatened" is being reviewed by the Tennessee Wildlife Resources Agency. Its status is currently being reviewed by the U. S. Fish and Wildlife Service to determine whether it needs to be federally-listed (Steven Alexander, U.S. Fish and Wildlife Service, Cookeville, TN, personal communication).

The presence of this species has not been recorded on the bird monitoring point counts conducted under contract to CROET within the routes established through the Exclusion Zone, and hence was not mentioned in this Addendum. However, additional highly pertinent data exists that has not been reported here. This species has been recorded at the identical location on the edge of, and within, the Exclusion Zone on the North Boundary Greenway trail in the vicinity of East Fork of Poplar Creek (Knight, 1999, Knight, 2000, TWRA, 2001; Robert and Leigh Loveday and J. D. Joslin, 2002, personal communication-see REFERENCES CITED for details). Such "site fidelity" by this species for four years in a row is indicative that this species is breeding along this greenway trail on the edge of the exclusion zone.

Any attempt to widen, pave, and/or increase vehicular traffic on this greenway trail to provide access to Parcel 4 of the ED-1 area would surely disturb and harass this species to the point of interfering with breeding. It would also further fragment this area, making this species much more vulnerable to Brown-headed Cowbird parasitism, to which is known to be susceptible.

In this context, it should be noted that the recent Executive Order pertaining to the International Migratory Bird Treaty Act (E.O. 13186, published in the Federal Register January 17, 2001) instructs all federal agencies to take reasonable actions to minimize impacts on migratory birds. The order also instructs all federal agencies to establish MOUs with the U.S. Fish & Wildlife Service to achieve this goal. Most specifically, the U. S. Fish & Wildlife Service has determined that bird species included in Partners in Flight's Birds of Conservation Concern 2001 Report be deemed priorities for conservation actions by all federal agencies. Furthermore, these lists will be consulted prior to any actions taken on federal lands that may impact migratory bird habitat.

The Cerulean Warbler, along with 5 other species mentioned above in item (5), is considered by the USFWS as a "Species of Management Concern." Hence special efforts should be taken to avoid incidental federal actions that might result in the take of this and these other five species.

RECOMMENDATION:

The presence of breeding Cerulean Warblers—a state-listed species, and one being currently considered for federal listing— was not considered in the original MAP, nor has it been mentioned in this Addendum. This species has been present for four consecutive breeding seasons adjacent to the Natural Area and along the most probable access pathway to Parcel 4. Its presence further argues for altering the MAP to exclude the 45-acre Parcel 4 from development and to include it as part of the Natural Area.

Page-specific Comments

EA Addendum, page 8, lines 12-14. Is the study cited here the report known as the "Fluor Daniel study"? A reference citation should be provided.

EA Addendum, Section 3.1, page 8, lines 31-42. In addition to the land use changes mentioned here, this "Land Use" section should mention the designation of the North Boundary Greenway adjacent to Parcel ED-1.

EA Addendum, Section 3.4, pages 10-11. This section describes various utility upgrades "planned" by CROET, the city, or other entities. As local residents, we are aware that some of these "plans" are not yet budgeted by anyone, and probably could be called "long-range intentions" or "dreams." To help DOE decisionmakers and the public differentiate actual commitments to development from intentions that are contingent on other actions (such as CROET's hopes of obtaining additional DOE land for development in the future), please indicate who "plans" each of the upgrades that are mentioned and identify the source of the information. (Comment specifically applies to lines 24-25 on page 10, lines 6-7 on page 11, lines 13-15 on page 11, and lines 23-24 on page 11.)

MAP - Section 3.1.3. Page 11, paragraph 3 in section. It has been our understanding that the Horizon Center covenants require (not merely recommend) the use of native plants in landscaping. This is important for effective mitigation of ecological impacts. Therefore, revise the MAP to indicate that this is a requirement, not a recommendation.

MAP - Section 3.1.3. Page 11, paragraph 4 in section (next to last paragraph on page). We have observed that tall fescue, identified as an invasive pest plant species in Tennessee, has been planted in lawn areas of the Horizon Center in violation of mitigation requirements. In addition to stating that annual rye grass and clover should be used in revegetating construction sites, the MAP should specify that tall fescue is not to be planted in the future.

MAP - Section 3.1.3. Page 11, paragraph 5 in section (last paragraph on page). It appears that the only restorative action CROET would be required to take to protect the ecological/botanical integrity of the Natural Area would be to try to remove exotic/invasive plants encroaching on the sites of sensitive plant species. This is hardly sufficient to meet the objectives of the MAP. To be effective in protecting the integrity of the Natural Area, incursion and spread of exotic/invasive plants should be controlled throughout the Natural Area, not just in the vicinity of a few protected species.

REFERENCES CITED

Knight, R. L. 1999. The season report. *The Migrant* (A Quarterly Journal of Ornithology published by The Tennessee Ornithological Society):70:133.

Knight, R. L. 2000. The season report. *The Migrant* 71:122.

T.W.R.A. 2001 (Tennessee Wildlife Resources Agency). Partners in Flight Breeding Bird Survey for the Oak Ridge Reservation, May-June, 2001. Nashville, Tennessee.

Robert and Leigh Loveday and J. D. Joslin, 2002. Details: J.D. Joslin saw and heard an adult male Cerulean Warbler singing at approximately 9 a.m., May 27, on the North Boundary Trail of the Oak Ridge Reservation, approximately 100 m from East Fork Poplar Creek on the boundary of the MAP Exclusion Zone for Parcel ED-1. Robert and Leigh Loveday separately heard the same species singing on the same trail at

approximately noon of the same day (May 27). J. D. Joslin again saw and heard an adult male Cerulean Warbler at approximately 10:30 am, June 2, about 80 yards from the previous sighting on the same trail at the Exclusion Zone boundary and 20 yards from East Fork Poplar Creek. All sightings were reported on the Tennessee Birdwatchers Internet list-serve (tn-birds@freelist.com). (Partners in Flight, and most breeding surveys, consider that male birds singing during the period from May 20 to July 1 represent likely breeding birds marking a territory.)

ATTACHMENT A

COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT ADDENDUM AND MITIGATION ACTION PLAN FOR THE PROPOSED TITLE TRANSFER OF PARCEL ED-1

Perry, Walter N

From: Ed Sonder [exs@ornl.gov]
Sent: Thursday, June 13, 2002 1:51 PM
To: NEPA (Stakeholders comments mailbox)
Subject: Parcel ED1

The Oak Ridge reservation has unusually rich bio-diversity and as such should become a permanent preserve. Removing of a few SMALL parcels from the periphery might be justified, but continuous whittling away of large areas for development will destroy the value of the reservation as a permanent natural preserve.

Therefore, as a citizen and resident of Oak Ridge I urge that the transfer to CROET of parcel ED1 be accompanied by at least the two following actions.

1) PERMANENT Natural area protection of the 531 area exclusion zone. This could be accomplished, for example, by donating a conservation easement for this zone to an organization such as the nature Conservancy.

2) The 45 acres, labeled Parcel 4, should be added to the 531 acre exclusion zone, as suggested by AFORR.

Sincerely,

Edward Sonder
102 Woodridge Lane
Oak Ridge TN 37830

Perry, Walter N

From: MarcyRReed@aol.com

Sent: Friday, June 14, 2002 1:21 PM

To: NEPA (Stakeholders comments mailbox)

Subject: Comments on Draft EA and MAP for proposed transfer of parcel ED-1

I am submitting these comments on behalf of TCWP. They are also attached as a MS Word file.

Thank you,
Marcy Reed
Executive Director
865-481-0286

Tennessee Citizens forWilderness Planning

Comments on Draft Environmental Assessment Addendum and Mitigation Action Plan for Proposed Transfer of Parcel ED-1 to the

Community Reuse Organization of East Tennessee – May 2002

Thesecomments are submitted on behalf of Tennessee Citizens for Wilderness Planning(TCWP), a 500-member, non-profit organization dedicated to protecting naturallands and waters through public ownership, legislation, and cooperation withthe private sector.

TCWPremains strongly in favor of a comprehensive land use plan and assessment forthe Oak Ridge Reservation (ORR), a plan that will include the **<i style='mso-bidi-font-style:normal'>entire**Reservation. Piece-meal development does not thoroughly evaluate cumulativeimpacts on the rich biodiversity of the ORR. Because of this, an Environmental Impact Statement or similar process isstill needed for the entire ORR. Such a plan and evaluation should includecost/benefit analysis of development initiatives on the ORR. While TCWP supports the ongoing Land UsePlanning Process that is being carried out by the Land Use Focus Group, thearea of study for this process has been limited to surplus land in thenorthwestern section of the ORR. Thus, this otherwise commendable processcannot achieve the goal of cumulative impact assessment.

1. TheAddendum includes an extensive section on cumulative impacts that enumeratescurrent and planned activities in the area. However, the perspective of thissection is only the pertinence of these actions to the single transfer of ED-1.The cumulative impacts to the value and missions of the ORR are not evaluated.In fact, in lines 12-14 of Sect. 5.2, the Addendum uses the additionalactivities to downplay the impacts of the single ED-1 transfer: "Overall, theproposed transfer of Parcel ED-1 would not have a large incremental impact onthe environment when added to the other past, present, and reasonablyforeseeable future actions discussed in Sect. 5.1." Similarly, Sect. 5.2.1 notes, "Because the total area is smallcompared to the remaining ORR land. the change in land use would result innegligible cumulative land use impacts." These statements attempt to justify continued whittling away of the ORRin small pieces without true cumulative impact assessment. This approach is aviolation of the National Environmental Policy Act.

2. Permanentprotection for the Natural Area of ED-1 is vital. Protection of this area was a primary mitigating action leadingto a Finding of No Significant Impact (FONSI) for ED-1 in 1996, and DOE isresponsible for assuring continued protection. The Environmental Assessment(EA) and Mitigation Action Plan (MAP) are extremely vague regarding how thedeed transfer would ensure this continued protection.

It is our understanding that deed restrictions aredifficult and costly to enforce. Onlythe previous owner, in this case DOE, is legally entitled to assert violationof the deed restriction, and redress typically is restricted to re-purchase ofthe lands and buildings at current market value. Under the deed-restriction scenario, DOE would need to continuemonitoring to discover any violations, take legal action against new owner(s),and bear the cost of such actions. Inaddition, deed restrictions can be subsequently dropped, as has been observedrecently with the transfer of the Boeing land.

To provide protection in perpetuity for the NaturalArea, the recommended vehicle is a fee-title-type transfer via donation of theland

to an agency or organization (e.g., The Nature Conservancy) that isequipped to manage land for conservation purposes. An acceptable alternative is donation of a conservation easementto such an entity. The land transfer oreasement should not relieve the owners of ED-1 development areas of clearlydefined and enforceable requirements to prevent damage to the Natural Area.

3. TCWPis concerned that the slow pace of leasing the development area is not beingadequately factored into assessment of impacts on the Natural Area. Section 4 of the Addendum notes that the"majority of the impacts have already occurred on the parcel as a result ofconstruction activities," whereas only 85 of the 426 acres for development havebeen disturbed to date. Considerable additional activity, with high potentialfor deleterious impacts, remains. Monitoring requirements must cover the entireperiod of construction, and monitoring procedures must specify mechanismscapable of determining that all requirements ar met.

4. Theapparent impact of siltation from an exposed construction area on thepopulation of the Tennessee Dace in Dace Branch during a 1999 storm event is ofconcern. While the Addendum conveys theexpectation that the population will recover, based on discovery of apopulation upstream from construction influence, this setback is evidence thatreliance on existing measures is not well founded and that constant vigilance,as well as advancements in the prevention of construction impacts, is needed.

5. TheMAP is vague and provides no oversight or accountability of CROET. Much is left to the discretion, interpretation,and "good faith effort" of CROET. TheMAP needs to clearly outline specific requirements, enumerate report recipientsand reviewers. and require public participation in reviews and on the advisorypanel. The advisory panel should bemandatory.

6. Languagein MAP Sect. 3.1.3 is weak with respect to native plants and minimizing lawnareas. Already non-native plants arebeing incorporated into the landscape in developed areas. Quantifiable requirements for minimizingland area disturbed at any one time are needed.

7. TCWPsupports the recommendation of the Advocates for the Oak Ridge Reservation(AFORR) to exclude the 45-acre Parcel 4 from development and add it to theNatural Area. This recommendation is based on the isolation of this parcel fromthe other development areas, which would entail the need to provide developmentaccess by constructing a bridge and/or undertaking damaging road improvement toan existing greenway. The economicvalue of developing Parcel 4 cannot possibly justify the environmental impactof these actions.

8. TCWPalso supports the AFORR recommendation to modify the MAP to include thedocumented recent presence of the Cerulean Warbler adjacent to and within theED-1 Natural Area. This species is currently listed by the State as "In Need ofManagement," and state and federal reviews for upgrading its protection statusare in progress. The presence of thisspecies and its location within the tract further support the exclusion ofParcel 4 from development.

TCWP appreciates the opportunity to convey these commentsand welcomes questions and further discussion.

Tennessee Citizens for Wilderness Planning
Comments on Draft Environmental Assessment Addendum and Mitigation Action Plan
for Proposed Transfer of Parcel ED-1 to the
Community Reuse Organization of East Tennessee – May 2002

These comments are submitted on behalf of Tennessee Citizens for Wilderness Planning (TCWP), a 500-member, non-profit organization dedicated to protecting natural lands and waters through public ownership, legislation, and cooperation with the private sector.

TCWP remains strongly in favor of a comprehensive land use plan and assessment for the Oak Ridge Reservation (ORR), a plan that will include the ***entire*** Reservation. Piece-meal development does not thoroughly evaluate cumulative impacts on the rich biodiversity of the ORR. Because of this, an Environmental Impact Statement or similar process is still needed for the entire ORR. Such a plan and evaluation should include cost/benefit analysis of development initiatives on the ORR. While TCWP supports the ongoing Land Use Planning Process that is being carried out by the Land Use Focus Group, the area of study for this process has been limited to surplus land in the northwestern section of the ORR. Thus, this otherwise commendable process cannot achieve the goal of cumulative impact assessment.

1. The Addendum includes an extensive section on cumulative impacts that enumerates current and planned activities in the area. However, the perspective of this section is only the pertinence of these actions to the single transfer of ED-1. The cumulative impacts to the value and missions of the ORR are not evaluated. In fact, in lines 12-14 of Sect. 5.2, the Addendum uses the additional activities to downplay the impacts of the single ED-1 transfer: "Overall, the proposed transfer of Parcel ED-1 would not have a large incremental impact on the environment when added to the other past, present, and reasonably foreseeable future actions discussed in Sect. 5.1." Similarly, Sect. 5.2.1 notes, "Because the total area is small compared to the remaining ORR land, the change in land use would result in negligible cumulative land use impacts." These statements attempt to justify continued whittling away of the ORR in small pieces without true cumulative impact assessment. This approach is a violation of the National Environmental Policy Act.

2. Permanent protection for the Natural Area of ED-1 is vital. Protection of this area was a primary mitigating action leading to a Finding of No Significant Impact (FONSI) for ED-1 in 1996, and DOE is responsible for assuring continued protection. The Environmental Assessment (EA) and Mitigation Action Plan (MAP) are extremely vague regarding how the deed transfer would ensure this continued protection.

   It is our understanding that deed restrictions are difficult and costly to enforce. Only the previous owner, in this case DOE, is legally entitled to assert violation of the deed restriction, and redress typically is restricted to re-purchase of the lands and buildings at current market value. Under the deed-restriction scenario, DOE would need to continue monitoring to discover any violations, take legal action against new

owner(s), and bear the cost of such actions. In addition, deed restrictions can be subsequently dropped, as has been observed recently with the transfer of the Boeing land.

To provide protection in perpetuity for the Natural Area, the recommended vehicle is a fee-title-type transfer via donation of the land to an agency or organization (e.g., The Nature Conservancy) that is equipped to manage land for conservation purposes. An acceptable alternative is donation of a conservation easement to such an entity. The land transfer or easement should not relieve the owners of ED-1 development areas of clearly defined and enforceable requirements to prevent damage to the Natural Area.

3. TCWP is concerned that the slow pace of leasing the development area is not being adequately factored into assessment of impacts on the Natural Area. Section 4 of the Addendum notes that the "majority of the impacts have already occurred on the parcel as a result of construction activities," whereas only 85 of the 426 acres for development have been disturbed to date. Considerable additional activity, with high potential for deleterious impacts, remains. Monitoring requirements must cover the entire period of construction, and monitoring procedures must specify mechanisms capable of determining that all requirements are met.

4. The apparent impact of siltation from an exposed construction area on the population of the Tennessee Dace in Dace Branch during a 1999 storm event is of concern. While the Addendum conveys the expectation that the population will recover, based on discovery of a population upstream from construction influence, this setback is evidence that reliance on existing measures is not well founded and that constant vigilance, as well as advancements in the prevention of construction impacts, is needed.

5. The MAP is vague and provides no oversight or accountability of CROET. Much is left to the discretion, interpretation, and "good faith effort" of CROET. The MAP needs to clearly outline specific requirements, enumerate report recipients and reviewers, and require public participation in reviews and on the advisory panel. The advisory panel should be mandatory.

6. Language in MAP Sect. 3.1.3 is weak with respect to native plants and minimizing lawn areas. Already non-native plants are being incorporated into the landscape in developed areas. Quantifiable requirements for minimizing land area disturbed at any one time are needed.

7. TCWP supports the recommendation of the Advocates for the Oak Ridge Reservation (AFORR) to exclude the 45-acre Parcel 4 from development and add it to the Natural Area. This recommendation is based on the isolation of this parcel from the other development areas, which would entail the need to provide development access by constructing a bridge and/or undertaking damaging road improvement to an existing

greenway. The economic value of developing Parcel 4 cannot possibly justify the environmental impact of these actions.

8. TCWP also supports the AFORR recommendation to modify the MAP to include the documented recent presence of the Cerulean Warbler adjacent to and within the ED-1 Natural Area. This species is currently listed by the State as "In Need of Management," and state and federal reviews for upgrading its protection status are in progress. The presence of this species and its location within the tract further support the exclusion of Parcel 4 from development.

TCWP appreciates the opportunity to convey these comments and welcomes questions and further discussion.

Perry, Walter N

From: Warren Webb [WebbWarren@msn.com]
Sent: Sunday, June 16, 2002 5:44 PM
To: NEPA (Stakeholders comments mailbox)
Subject: Comments on ED-1

Following below and attached as a WordPerfect file are comments on the proposed action. Please consider them in your analysis.

Comments on the "Draft EA Addendum for the Proposed Transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee" (DOE/EA-1113-A)

Submitted by: Warren Webb

228 West Tennessee Ave

Oak Ridge, TN 37830

June 13, 2002

General Comments

1. This is a major federal action significantly affecting the human environment, requiring an EIS. This is particularly so since the proposal is to transfer land, including custodianship of a sizeable natural area, to a development entity, with meaningful restrictions and enforcement provisions (deed restrictions notwithstanding). Instead, DOE has elected to issue an "EA Addendum." Please explain what is a "Draft EA Addendum" as a National Environmental Policy Act (NEPA) document under CEQ and DOE regulations. The DOE issued an EA for an action that should have been an EIS. The result of that was a "mitigated FONSI" – itself a somewhat strange creature – which has been subsequently violated (see comments below), and now we have this other strange creature. The document, whatever it is, should put this all in context for members of the public.

2. Please explain why you have evaluated only one alternative (dismissing the no action alternative) in contravention of the National Environmental Policy Act. Other reasonable alternatives are possible: ceding/selling a portion of the land to other entities; ceding/selling the parcel to the City of Oak Ridge; returning the parcel to DOE management.

3. Please explain how the original Mitigation Action Plan (MAP) transformed into the MAP that you present here. The original MAP did not allow for the roads and bridges that have been built. The Comprehensive Development Plan presented and partially implemented by CROET was not submitted for public review and was not appropriately reviewed by state agencies, as shown by your own documents.

4. The preparers are not given – although this has not been presented as an EIS (as it should have been) – it has been put out for public comment, and the public has a right to know who the preparers are and what are their qualifications.

Specific Comments

1. Section 1.1: DOE's need poses an unanswered question – would the transfer of ED-1 to CROET "help offset economic losses . . ."? Because this has been postulated in this section, it is incumbent on DOE to analyze this question in the EA. At present, it does not. Please explain.

2. Section 1.2 states (lines 18- 20) that "The MAP accomplished this by excluding areas . . .from disturbance and development . . ." In fact, two large roads/bridges were put across the "Exclusion Area." – I would call this "disturbance and development." Please explain what public and agency reviews were accomplished before undertaking these actions, and address the potential environmental impacts of such actions in the body of your report. Please also reference Annual Reports subsequent to 1998.

3. Section 2, paragraph 2 (line 11). This paragraph is based solely on CROET's alleged information to DOE, which is not supplied. Are we (the public) really supposed to believe this? Please supply the information that CROET shared with you which would help us understand the economic consequence of the action for the community.

4. Section 2, paragraph 3, lines 21 et seq. Several options are mentioned in this paragraph which should be considered as alternatives in the "EA Addendum." Transfer of the "Exclusion Area" to another entity is of particular interest. Why is this option not considered further?

5. Section 2, paragraph 4, lines 31 et seq. This paragraph states the continued development would be conducted outside of the Natural Area. How will CROET accomplish this while gaining access to Area 4? Please explain.

6. Section 2, paragraph 5, lines 36 et seq. Please explain how deed conditions would be enforced by DOE. It seems unlikely that DOE would have the resources or the motivation to enforce any deed restrictions.

7. Section 3.2, paragraph 1. You state that "development plan concepts" were "discussed" with TWRA and other entities. Although these discussions may have been "approved by DOE," that does not in itself constitute approval by agencies. Please supply discussion and agency comments to support your contention that all parties approved of this action, or, if not, what were objections or unresolved issues.

8. Section 3.3: Here you present a lot of data, because they are available. Yet you have nothing to say about it in the "Environmental Consequences" section. In the "Purpose and Need" section, you said that economic issues were paramount. Please explain how you can omit analysis of the data you present in this section in the Environmental Consequences section.

9. Section 4: almost all of two pages are devoted to the environmental consequences of this significant federal action. DOE seems to think that no other issues arise other than listed species and cultural resources. In fact, significant socioeconomic effects could arise, as well as impacts to neotropical migratory birds and other species. Statements that no further intrusions into the natural area (e.g., page 12 lines 21-22) are not convincing if CROET intends to gain access to Area 4. An alternative would be to develop the existing road on the west boundary, but this would itself further fragment forested habitat for birds and other animals and would

destroy a large portion of an existing greenway. Please add an evaluation of these eventualities.

10. Section 4, page 12, lines 28-31: The final paragraph to the introduction of Section 4 states the "DOE has determined that no additional impacts would occur with transfer of the parcel beyond those presented in . . . the 1996 EA." In fact, impacts beyond the 1996 may already have occurred or be occurring. This is because the 1996 EA, and the MAP which accompanied the "mitigated FONSI," did not contemplate the significant incursions into the then Exclusion Zone (now Natural Area) which were subsequently implemented without effective public and agency review (the Comprehensive Development Plan prepared by Lockwood Greene for CROET.) The record from Annual Reports shows that at least one agency raised issues which were never resolved. That notwithstanding, the development plan proposed two significant bridges and other roadway fragmentations of natural area corridors which have never been evaluated for impacts. Thus, DOE should not rely on the 1996 EA to dismiss impacts but should evaluate unanticipated impacts that would be carried over under the proposed action. Please explain how these subsequent inadequately reviewed effects would carry over to the proposed action, or its as yet unanalyzed alternatives.

11. Section 5.1: DOE spends almost all of three pages (more than the attention paid to Environmental Consequences) listing many other projects that may affect the proposed action. Interestingly, some analysis follows of socioeconomic impacts that may accrue from these projects (which are not evaluated in Section 4), yet no attempt is made to place this analysis relevant to the project. Without such analysis, this is simply a waste of paper. Please explain how the cumulative effects of other actions, including socioeconomic effects, would interface with this proposed action.

12. Section 5.2.5, page 20, lines 29 - 34 : These statements seem to imply that because "large areas" would remain (not a certain conclusion), the impacts of the proposed action are of no consequence and need not be evaluated. Please explain the reasoning supporting these statements.

Comments on the "Mitigation Action Plan for the Proposed Transfer of Parcel ED-2 to the Community Reuse Organization of East Tennessee, accompaning the "Draft EA Addendum for the Proposed Transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee" (DOE/EA-1113-A)

1. Please give the names and qualifications of the various individuals conducting the bird surveys from which you produced your graphs.

2. Please present a discussion of how your analysis compares to trend analysis as described b the USGS.

3. Please present the data regarding corvids and nest parasites, and evaluate how these could affect bird breeding in the area (e.g., changing from a source area to a sink area). There is also the possibility of increased access of other nest predators, such as raccoons and skunks, which has not been evaluated here or in the "EA Addendum."

Memorandum

To: David Allen, Nancy Carnes, Katy Kates

CC: File-SMC

From: Susan Cange

Date: June 19, 2002

Re: Additional Comments on DOE/EA-1113-A, EA Addendum and Mitigation Action Plan for Proposed Transfer of Parcel ED-1 to CROET

Below is a listing of additional comments submitted on the above subject document. Attached are copies of comments for your files.

1. Ed Sonder, June 13, 2002
2. Marcy R. Reed, on behalf of Tennessee Citizens for Wilderness Planning, June 14, 2002
3. Warren Webb, June 13, 2002
4. Herbert L. Harper, Executive Director and Deputy State Historic Preservation Officer, Tennessee Department of Environmental and Conservation, May 24, 2002

If you have questions, please call me at 576-0334.

Susan:af-d

Attachments: As Stated

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

May 24, 2002

Mr. David Allen
Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

RE: DOE, DRAFT ENVIRONMENTAL ASSESSMENT ADDENDUM, TRANSFER OF PARCEL ED-1 TO CROET, OAK RIDGE, ROANE COUNTY, TN

Dear Mr. Allen:

At your request, our office has reviewed the above-referenced draft environmental assessment addendum in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). Based on the information provided, and in accordance with our previous review of the archaeological survey of the area of potential effect, we find that the project area, as currently defined, contains no archaeological resources eligible for listing in the National Register of Historic Places.

This office has no objection to the implementation of this project. However, prior to transfer, and in accordance with our correspondence of April 29, 2002; please submit the proposed final deed restrictions to this office for our review and comment. If project plans are changed, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

Your cooperation is appreciated.

Sincerely,

Herbert L. Harper

Herbert L. Harper
Executive Director and
Deputy State Historic
Preservation Officer

HLH/jmb

ETEC
EAST TENNESSEE ECONOMIC COUNCIL

June 13, 2002

Mr. David Allen, SE-30
U.S. Department of Energy
P.O. Box 2001
Oak Ridge, Tennessee 37831-2001

Subject: Comments Regarding the Environmental Assessment Addendum for Parcel ED-1

Dear Mr. Allen:

I have read with great interest the Environmental Assessment Addendum for Parcel ED-1 and would like to make the following comments.

The site should be transferred to the Community Reuse Organization of East Tennessee (CROET) as quickly as possible and with as few restrictions as possible. The development of ED-1, the related environmental issues and this transfer have been well publicized to a broad and diverse audience. The DOE effort for expeditious transfer of the property with adequate review should be applauded.

The purpose of the transfer is equally clear. It is essential that the area have a strong industrial base that augments and supports the existing DOE missions, and helps the region lessen the region's economic dependence on the Department of Energy's annual appropriations. That requires first class industrial facilities like those on Parcel ED-1 and ongoing partnerships between the Department and the community on a number of related activities.

We believe that the requirements for environmental monitoring should be simplified. The ultimate users of the park, new industries to our region, should be guided by the zoning codes of the community and the development covenants incorporated into the center's by-laws. Each requires protections of the environment and development of quality spaces.

The mission of the CROET is to bring in new companies and jobs to the region. The requirements within the Addendum seem to force the organization to become something that it is not, and mandate expenses not covered in the organization's mission. If taken to an extreme, the requirements regarding environmental monitoring and stewardship could make the mission of CROET impossible. We believe that all requirements that are not absolutely essential to the maintenance of the few threatened or endangered species on the site be removed.

Thank you for the opportunity of commenting on this most important issue.

Sincerely,

Jim Campbell
President, East Tennessee Economic Council

EAST TENNESSEE ECONOMIC COUNCIL
P.O. Box 5057, Oak Ridge, TN 37831 | Office location: 40 New York Avenue | Phone: 865.483.3047 | Fax: 865.482.0191 | Email: info@eteconline.org

CROET

Community Rehab Organization of East Tennessee

107 Iris Way

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Oak Ridge, TN 37831-2110

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A FACSIMILE TRANSMITTAL

DATE: 6-13-02

TO: David Allen **FAX:** 576-0746

FROM: Andrea

SUBJECT: EA for Parcel ED-1

NO. OF PAGES (INCLUDING THIS SHEET) IS: 6

COMMENTS:

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David R. Allen
U.S. Department of Energy
SE-30-1
P.O. Box 2001
Oak Ridge, TN 37831

The following are my comments on the Parcel ED-1 documents;

Environmental Assessment Addendum

- Please provide copies of the deed and transfer agreement to interested stakeholders. The ED-1 documents must not be finalized and the transfer of the property to CROET must not be completed until stakeholders have had the opportunity to review and comment on the deed and transfer agreement. The agreement is part of the NEPA action and thus subject to public comment.
- What is the "regulatory process" (p 12 of the MAP) that enforces the deed restrictions and transfer agreement. PLEASE DESCRIBE
- Who is responsible for ensuring protection of natural, historic, and archaeological resources if CROET ceases to exist. Please discuss options.
- Will deed restrictions be included/transferred to new owners when CROET lands are sold?

- Who is responsible for oversight of new owners activities and their potential impact on the natural, historic, and archaeological resources?

- Who is responsible for development of infrastructure following transfer of ownership to CROET?

- How much does CROET expect to realize on the sale of the 426 acres of land available for development?

- What are the anticipated costs of additional infrastructure for development of the 426 acres? Please itemize.

- What can the city expect in property and other taxes from development? Please provide estimates of dollar amounts at 2, 5, and 10 year intervals.

With regard to the Mitigation Action Plan (MAP):

- When property is sold by CROET who is responsible for MAP monitoring/reports?

- Who is responsible for oversight of the MAP requirements?

- Will MAP reports be available to the public?
- Will the public be informed of the availability and location of MAP reports? Please note location of reports.
- Where and when will the public find CROET's plans for "... continuing to preserve and maintain the integrity of the Natural Area" (page 11 of the MAP)?

Thank you for your attention to these concerns.

Lorene L. Sigal
112 Parma Road
Oak Ridge, TN 37830

Tel. and FAX 482-4125

Note: While the EA Addendum (page 6) states that "... no other parcels of sufficient size and contiguity were available on the ORR to meet the requirements for an industrial park.", this statement is misleading because there are other large tracts of industrial land adjoining/near the ORR (e.g., the TVA "Breeder Reactor" land, Roane Regional Business & Technology Park).

Comment on the May 2002 Environmental Assessment Addendum for the Proposed Transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee

June 14, 2002
Robert Peelle, 130 Oklahoma Avenue, Oak Ridge, TN 37830

SUMMARY: The proposed action involves a significant chunk of the present reservation, and is an environmentally important federal action! Its assessment must be treated seriously.

The mitigation of environmental degradation of the "exclusion" or "natural" area of ED-1 is unlikely to be effective over the life of the Horizon Center industrial park because of the general ineffectiveness of deed restrictions over extended periods. Also, under plausible circumstances local employment might be reduced by the proposed action.

These difficulties would be ameliorated if the CROET lease period were instead extended to 99+ years. However, if the property is to be transferred to CROET, land not yet sold should revert to the Department of Energy in case CROET should ever demise or fail to care for or utilize the land as agreed at the time of transfer. In any case, the Natural Area portion should not be transferred to any economic development group.

The transfer of ED-1 has quite different environmental consequences from the current lease program, since the large tract of largely open land will permanently reduce the productivity of the nearby woodland and stimulate the spread of open-land pests such as the fire ant. The EA Amendment for the proposed transfer should recognize this long term difference

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COMMENTS on the Proposed Actions that require EA Amendment analysis

Figure 1.1 of the EA Amendment illustrates what a large area is being considered, and by inference the importance of any decision on transfer. Text of the draft suggests, tacitly in most cases, that the matter being considered is not very important! The eventual extent of the cleared land will affect life in all the surrounding lands and make the reservation less of a unique area. The pesky species found on cleared land will benefit. Will economic or other benefits outweigh this loss? The effective permanence of a land transfer places the decision in bold relief.

The desirability of the subject project is based in part on assumptions that:
(1) the site is surplus to DOE's future needs,
(2) CROET is eligible to receive priority for below-market land transfer from the DOE,

(3)the site will attract firms that will provide substantial employment and tax base increments,

(4) CROET will prosper sufficiently to enable it to carry out its environmental responsibilities under the land transfer agreement,

(5) the DOE will diligently enforce "deed restrictions" to protect the Natural Area as described in the EA Amendment, and

(6) future title transfers (from CROET) will include the same restrictions and be enforced.

The validity of each of these assumptions is in doubt, or at least the validity is not demonstrated in the EA Amendment. The last three seem important to this assessment and must be discussed. Assumption (3) is pertinent because, if little business locates in ED-1, the small benefit could not outweigh the stated environmental costs. [Data must exist on how frequently well executed industrial parks are unsuccessful.] Assumption (2) need not be discussed in this EA, but the reference to the transfer authority should be specific for an organization such as CROET. Assumption (1) appears to be outside an EA analysis, except for the possibility discussed in the next paragraph.

Energy sufficiency will remain a serious concern in our country, so energy research, development, and demonstration projects will continue to be placed on federal lands from time to time. Transfer of ED-1 may preclude a substantial federal project that otherwise would use this site. Unless ED-1 sales to business and industry are brisk, these businesses might produce less economic value than the federal project. Thus, the socioeconomic effect of the ED-1 transfer could in the end be negative! The DOE determination that the land is surplus was necessarily based on known or explicitly considered programmatic demands, while the projects that will seem imperative by 2020 are unknown now even to futurists. The alternative of leasing ED-1 to CROET for 99+ years should be considered in the EA.

The EA assumes that restrictions within the deed transferring ED-1 to CROET can assure long-term protection of the Natural Area now excluded from development. I believe this protection is illusory for the reasons below:

a. Long term, CROET or its successors cannot give priority to a function that may sometimes conflict with the economic development mission.

b. The costs of monitoring and protecting the 531-acre Natural Area will seem considerable when land sales are slow. The financial structure and prospects of CROET must be considered in the EA Amendment, and are much more important to the present issue than city or county finances. While current CROET management surely intends to fulfill any transfer agreement, the foundation of CROET in federal grants could place their future in jeopardy.

c. The Register of Deeds office does not enforce deed restrictions! DOE or successor agencies would have to enforce these restrictions consistently. This housekeeping responsibility is not likely to be given priority for long.

d. Should CROET demise, the efficacy of deed restrictions is further questioned. Following a second land transfer such restrictions have not generally proved effective. (Mary English, UT EERC, 1999)

Since deed restrictions cannot assure performance, DOE should pursue one of the following alternatives if the developable acreage is to be transferred:

a. DOE should retain at least the 531 acre Natural Area. [Why would CROET risk owning the East Fork Poplar Creek flood plain with the CERCLA liabilities that would occur if contamination from Y-12 is discovered there?] Preferably, DOE should further reduce negative impacts by retaining some or all of the land CROET has not yet disturbed.

b. Transfer the Natural Area to an agency or organization involved with land conservation or a related goal like wildlife management.

c. Make all land transfers to CROET with a reversion clause that would return the land to DOE or the successor agency if CROET should demise, not meet the restrictions on the natural area, or fail to carry out its stated goals. (for example, by proposing to sell ED-1 for a water park.)

The EA must recognize the limited effectiveness of deed restrictions and the environmental consequences of these limitations.]

My own perusal of the MAP for the transfer to CROET shows it is intended carefully to prevent significant adverse environmental impacts of the transfer. However, I believe experience over the country has shown that over time deed restrictions, easements, and similar instrument are often unenforceable. I therefore believe that following this plan would preclude issuance of a Finding of No Significant Impact for the transfer. Early implementation of transfer of the developable land requires another mechanism.

I believe using a reversion clause is the most reliable, next to substituting a 99+ year lease. Research on the effectiveness of reversion clauses is warranted.

Comment on EA details that require little analysis.

At the beginning of section 3.4.2 it is unclear what the initial water source for ED-1 would be, and the expected availability of this source until long -term connections can be completed to the city system.

In 3.4.3, a statement is needed about the expected future viability of the ETTP wastewater plant, since the connection to Oak Ridge municipal plant may be long delayed. Are industries that would require pretreatment of waste excluded from ED-1?

The EA Amendment in section 4 does not yet cover the environmental damage incident to the bridges over the creek. Will the MAP control such damage?

In section 5.1, discussions about Rarity Ridge, Rt. 58 expansion, and perhaps others need to be updated.

Section 5.2.3 treats employment impacts in a cavalier manner. The conclusion as stated is likely correct (growth rate within historical limits), but that is very small

comfort. Socioeconomic impacts were very large 1943-50. Better limit the historical period for the comparison.

Robert Pavlik
483-8974

DAVID L. COFFEY

122 CALDWELL DRIVE OAK RIDGE, TENNESSEE 37830
TELEPHONE OR FAX 423-483-6487 E-MAIL: 76226.1622@COMPUSERVE.COM

June 17, 2002

Mr. David Allen, SE-30
U. S. Department of Energy
P. O. Box 2001
Oak Ridge, TN 37830-2001

Dear Mr. Allen:

I appreciate this opportunity to comment on the Environmental Assessment Addendum for Parcel ED-1.

Your actions toward transferring this parcel to the Community Reuse Organization of East Tennessee are very much in keeping with the intent of Congress to alleviate economic impacts from federal government downsizing in East Tennessee.

Toward that end, I believe it is important to minimize restrictions and the appearance that this property will be an ongoing environmental research laboratory. Certainly we have many hundreds of acres in the western Oak Ridge area already devoted to those activities.

From my own industry experience I feel strongly that any hint that this industrial site would be treated as an ORNL environmental study area would be reason enough for a prospect to search elsewhere.

This is not to suggest that environmental restrictions should be relaxed. There are adequate controls in law and regulations to assure respect for the land, water and air.

However, it would be absurd to meddle in the affairs of a prospect by specifying overly restrictive landscape and access limits. Rather, we should encourage the area to be developed as a park-like setting for responsible corporate citizens.

Parcel ED-1 has been thoroughly monitored throughout its development. I trust that you will do all that you can to allow it now to become a successful industrial site.

Sincerely,

David L. Coffey

David L. Coffey
CROET Chairman

CROET

Community Reuse Organization
of East Tennessee

107 Lea Way

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June 13, 2002

Mr. David Allen, SE-30
U.S. Department of Energy
P.O. Box 2001
Oak Ridge, Tennessee 37831-2001

Subject: Comments Regarding the Environmental Assessment Addendum for Parcel ED-1

Dear Mr. Allen:

I have read with great interest the Environmental Assessment Addendum for Parcel ED-1 and would like to make the following comments.

First and foremost, the site should be transferred to our organization as expeditiously as possible and with as few constraints on its use as possible. The community and surrounding region are dependent upon the development of the park as a means of mitigating the ongoing reorganization and attendant job loss within the Oak Ridge Federal complex.

Towards that end, the development areas should be provided with transferable indemnification and should be transferred as a de-listed property under Superfund designation.

We have done an exceptional job of maintaining and even enhancing the environmental resources of the park while under our stewardship over the past 6 years. The existing Environmental Assessment for this parcel resulted in monitoring efforts during this time, which have shown, during the most intensive development period of the park, that there have been no adverse impacts. This should indicate that we will continue to be exceptional stewards and that continued long term monitoring is unnecessary.

The nearly 500 acres of natural area provides a significant buffer for any threatened or endangered species and should preclude the necessity for extensive on-going monitoring and inspections of these areas.

The required inspections are redundant and unnecessary and should be required only on an annual basis and should end after 3 years.

CROET should not be held accountable for natural succession within the natural or sensitive areas.

CROET should only be held accountable for any invasive species it is responsible for directly introducing.

The document is written in a manner that could be interpreted as prohibiting activity within the Natural area. Save for the sensitive areas, it should be made clear that there are no restrictions on crossings through the natural area, particularly for the purpose of developing necessary infrastructure extensions.

The prohibition on using non-native grasses for landscaping should be removed.

According to published reports, there are those who would suggest that the natural areas be transferred to an entity other than CROET. It is imperative that the parcel be transferred to CROET in its entirety. This is the only way in which CROET can provide any assurance that the integrity of the sensitive and natural areas will be maintained. Having any other entity control those areas without CROET's complete concurrence would result in a potentially confrontational and unworkable situation that would likely damage our ability to effectively market the developable lots and moreover, to control events within the natural area. As we are responsible, under the current EA and the proposed amended document, for mitigating these areas, should some unforseen damage occur, having the areas in the control of others is simply unworkable.

We are particularly pleased that DOE has recognized our historic stewardship of this site and proposes that CROET oversee the continued protection of the environmental resources and that we do so without some arbitrary external over-site. As you know, CROET has an extremely inclusive board of directors of 42 individuals that represent collectively, virtually every stakeholder in the region. Our Board meetings are open to the public and there is an opportunity at these meetings for the public at large to comment on any issue relating to CROET. In addition, the meetings are regularly reported on by the news media. It is our intent to report the findings of the continued monitoring of the ecological resources to the Board annually. In this manner, all stakeholders in the region and indeed, nationally, will have either representational or direct access to our ongoing activities.

Lastly, perhaps more than anyone, we recognize the value of the natural area from a ecological and marketability perspective. We have demonstrated our ability and willingness to protect important environmental resources while simultaneously developing a seemingly incongruent adjacent land use. We have done so because it is the right thing to do and because it was a good

business decision. The natural area is a key component of our ability to sell the park's developed property to targeted upscale businesses that place high value on aesthetic features such as the stream, the hardwoods and even the fauna. To not protect this resource would be folly.

Thank you for the opportunity of commenting on an item critical to the future of Oak Ridge and our organization.

Sincerely,

Lawrence T. Young
President and CEO

Advocates for the Oak Ridge Reservation
112 Newcrest Lane
Oak Ridge, Tennessee 37830

June 9, 2002

Mr. David Allen
United States Department of Energy
Oak Ridge Operations Office
200 Administration Road
P.O. Box 2001
Oak Ridge, Tennessee 37831

Dear Mr. Allen:

The Advocates for the Oak Ridge Reservation (AFORR) are pleased to offer the enclosed comments to the U. S. Department of Energy concerning the proposed transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee.

The enclosed comments are our combined reactions to both the EA Addendum and the corresponding Mitigation Action Plan, entitled, "National Environmental Policy Act Environmental Assessment Addendum and Mitigation Action Plan for the Proposed Transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee."

Sincerely,

J. Devereux Joslin

J. Devereux Joslin
President
Advocates for the Oak Ridge Reservation
112 Newcrest Lane
Oak Ridge, TN 37830

Enclosure

Comments on DOE/EA-1113-A Draft May 2002 "Environmental Assessment Addendum and Mitigation Action Plan for the Proposed Transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee"

1. DOE needs to provide an effective mechanism for protecting the exclusion zone.

AFORR's primary concern with this assessment stems from the total absence of specificity in the report concerning how protection will be achieved for the existing "Natural Area" or "Exclusion Zone" mandated in the original Mitigation Action Plan. The current addendum simply states, "Conditions of the deed and transfer agreement would ensure that CROET continued to provide protection..." But the assessment never states how this will be accomplished.

We infer (from the text of the draft EA Addendum and draft revised MAP) that DOE intends to institute a deed restriction to prohibit future owners from encroaching upon the Exclusion Zone. We have serious concerns about this approach. A deed restriction is not an effective mechanism to accomplish the objective of permanent protection. Deed restrictions generally can be enforced only by the seller (i.e., DOE) taking the property back. No one else can enforce the restriction, and there are no less momentous mechanisms of enforcement. We think that it would be cumbersome for DOE to continue to monitor the situation for violations and we think that DOE would be unlikely to have the will or the resources to act to reclaim the property, particularly if it was necessary to compensate the owner for the current commercial value of the land and improvements, particularly if the violation is not one of major proportions. A deed restriction would not be an effective mechanism for protecting the area.

RECOMMENDATION:

AFORR's primary concern with this proposed action is the need for an effective mechanism to ensure protection for the existing "Natural Area" or "Exclusion Zone," mandated in the original Finding of No Significant Impact (FONSI) and Mitigation Action Plan (MAP) as one of the main mitigation measures necessary for the FONSI.

The most effective immediate alternative would be retention of ownership by DOE, with the establishment of a Conservation Easement over the Exclusion Zone, with monitoring and management to be conducted under an appropriate arrangement.

Eventually, DOE could choose to transfer the entire Natural Area to an agency or organization that is equipped to manage it for conservation purposes. This is only fitting since conservation of natural and cultural resources was the original reason for setting up this zone in the original NEPA document (see 10 CFR 1021.331).

2. DOE needs to provide enforceable mechanism to ensure that private owners will fulfill their obligations to meet mitigation commitments

In addition to ensuring that development does not encroach on the Exclusion Zone, AFORR is concerned about the need for an enforceable mechanism to ensure that CROET or its successors fulfill their obligations for environmental monitoring and other

management actions required under the FONSI and MAP. The FONSI was conditioned on continued monitoring and other continuing actions to protect site streams and other natural resources, and AFORR believes that the FONSI requires that DOE establish a mechanism to ensure that these actions are carried out. For example, the landowner could be required to post a bond to ensure its future performance.

3. Monitoring done to date should not be represented as "Post-Development," and monitoring should be required to continue until development is complete.

We find the representation of the currently presented monitoring data as a "Summary of Pre- and Post-Development Monitoring (1996-2000)" (Page 5) to be misleading. The goals of The Mitigation Action Plan were "pre- and post-construction assessment of natural succession and impacts of development on natural communities and populations using data collected during monitoring,"

It is clear from the description of construction activities that have taken place to date (see text and Fig 1.2.) that less than 85 acres of the 426 acres designated for developed have been disturbed. Since only about 20 to 25% of the area has been disturbed in the initial 6 years since the site was established, it is clear that any monitoring data collected so far has very little meaning with regard to evaluating the impact of development.

RECOMMENDATION:

To meet the mitigation requirements in the original FONSI and MAP, DOE must ensure a continuing commitment to monitoring during the remainder of the development process and after development is complete. The MAP should spell out clearly what the commitment to future monitoring will be. The purpose of monitoring is (a) to determine the impact of development on natural resources and (b) to determine if future mitigative action will be needed. Clearly, final determinations on these points this cannot be made until after construction activity is completed, but the current MAP does not provide for this to be done.

4. DOE needs to establish accountability for future monitoring and mitigation by CROET

The section on page 12, "4. Map Review and Reporting Requirements," clearly spells out when CROET will review the MAP. But this requirement specifies virtually no real actions that must occur at these times. The description even admits that "review could be nothing more than re-reading the MAP to determine if changes are necessary." In fact, there seem to be no requirements in this portion of the plan at all that demand serious accountability.

There is at the bottom of page 12 mention of an "optional" Peer Review Panel, which CROET has complete discretion concerning its establishment. The current

suggested make-up is entirely of governmental agencies, that may or may not have any vested interest in seeing that natural and cultural resources be fully protected.

The CROET lacks institutional expertise on conservation. It operates as a private entity without representative public involvement or oversight, and it has failed in the past to follow some mitigation requirements. Two examples of CROET's failings are the unilateral termination of monitoring after 2000 and the planting of tall fescue, listed as an invasive exotic species in Tennessee, instead of alternative grasses specified in the MAP. Therefore, it is imperative that external review and oversight of mitigation be made a mandatory condition of the transfer, not an optional item.

RECOMMENDATION:

AFORR is concerned that the requirements for MAP review and follow-up are vague and that there are no provisions to assure that CROET fulfills its obligations to mitigation. Requirements for monitoring, review, and follow-up should be made explicit and should include external oversight. We recommend that MAP review and reporting requirements be clearly spelled out. Further, oversight of CROET in MAP Review and Report should be a stated requirement in this document. Finally, this panel should allow for citizen input, especially from representatives of non-governmental organizations that are concerned about natural and cultural resources.

5. The EA and MAP do not acknowledge or address the adverse environmental impacts of developing 'Development Area 4" of Parcel ED-1. This omission must be corrected, and we recommend that this area be excluded from the proposed transfer and from development under the existing lease.

"Development Area 4," at the extreme southwest end of Parcel ED-1 (identified in Figure 1.1 of the MAP) is isolated from the rest of ED-1 and separated from the rest of the development by East Fork Poplar Creek and Exclusion Zone areas. The EA does not discuss either how road and utility access could be established to this area or the environmental impacts of such infrastructure development, and the MAP does not discuss measures to mitigate these impacts.

AFORR is concerned that the development of this 45-acre tract could have environmental costs in excess of any economic benefits. We see three possible ways to develop access to this parcel: (1) cut yet another roadway through the Exclusion Zone and build yet another bridge across East Fork Poplar Creek and through its floodplain, (2) develop an access corridor from Blair Road on the southwest, crossing the Tennessee Valley Authority (TVA) property and Poplar Creek. or (3) convert the existing one-lane gravel access road (currently open to the public as a portion of the Oak Ridge North Boundary Greenway Trail) that winds through the Oak Ridge Reservation between McKinney Ridge and East Fork Poplar Creek into a highway.

All of these access methods would have significant environmental and economic costs. Option 1, a new bridge, would be expensive and would further fragment the

Natural Area, which has already been fragmented by two other 4-lane roadways and bridges. Construction would cause additional disturbance to the forested area along the creek in the Natural Area and to the waters of the creek. The second option, developing an access corridor across TVA property and Poplar Creek, would require an even larger bridge than the first option, and would require TVA's cooperation.

Option 3, widening and paving the gravel road, would also result in significant fragmentation, by separating the entire Natural Area along the creek from the hundreds of undisturbed acres on McKinney Ridge. The convergence of this Natural Area and McKinney Ridge currently supports the breeding of a number of bird species of conservation concern, according to breeding bird surveys conducted by Partners and Flight and the Tennessee Wildlife Research Agency Partners in Flight along this trail over the past seven years. The area immediately adjacent to this particular portion of the trail has year after year been demonstrated to contain breeding grounds for no less than six bird species that are on Partners in Flight National Watch List—Cerulean Warbler (*Dendroica cerulea*), Wood Thrush (*Hylocichla mustelina*), Kentucky Warbler (*Oporornis formosus*), Prairie Warbler (*Dendroica discolor*), Blue-winged Warbler (*Vermivora pinus*), and Prothonotary Warbler (*Protonaria citrea*). Concern for the Cerulean Warbler is particularly high nationwide (see 6. below). Furthermore, disturbance of this trail would lead to the loss of additional Oak Ridge Reservation land and a popular section of the 6-mile North Boundary Greenway trail, used for hiking, bicycling, birdwatching, and other recreation.

RECOMMENDATION:

DOE should revise the EA to address the impacts of developing access to Development Area 4, in view of new information that has surfaced, and new decisions that have been made, since the original ED-1 EA. Furthermore, in view of the magnitude of the environmental impacts that we expect to be associated with developing this area, we ask that (1) this area and adjacent exclusion areas be excluded from the proposed transfer action and (2) the MAP be amended to exclude this area from development under the existing lease with CROET.

6. DOE should revise the EA to acknowledge the presence of the Cerulean Warbler on Parcel ED-1 and should revise the Mitigation Action Plan to prevent adverse impacts to this species.

Among the purposes of the Addendum are to "2. Determine if changes to the MAP are warranted..." and "3...defining when mitigation is necessary." One piece of information—that is not mentioned in the original MAP six years ago nor in either document here—is the well-documented presence of the Cerulean Warbler on the edge and within the ED-1 Exclusion Zone for four years in a row during the breeding season. This species is already state-listed as "In Need of Management," and upgrading its state status to "threatened" is being reviewed by the Tennessee Wildlife Resources Agency. Its status is currently being reviewed by the U. S. Fish and Wildlife Service to determine whether it needs to be federally-listed (Steven Alexander, U.S. Fish and Wildlife Service, Cookeville, TN, personal communication).

The presence of this species has not been recorded on the bird monitoring point counts conducted under contract to CROET within the routes established through the Exclusion Zone, and hence was not mentioned in this Addendum. However, additional highly pertinent data exists that has not been reported here. This species has been recorded at the identical location on the edge of, and within, the Exclusion Zone on the North Boundary Greenway trail in the vicinity of East Fork of Poplar Creek (Knight, 1999, Knight, 2000, TWRA, 2001; Robert and Leigh Loveday and J. D. Joslin, 2002, personal communication-see REFERENCES CITED for details). Such "site fidelity" by this species for four years in a row is indicative that this species is breeding along this greenway trail on the edge of the exclusion zone.

Any attempt to widen, pave, and/or increase vehicular traffic on this greenway trail to provide access to Parcel 4 of the ED-1 area would surely disturb and harass this species to the point of interfering with breeding. It would also further fragment this area, making this species much more vulnerable to Brown-headed Cowbird parasitism, to which is known to be susceptible.

In this context, it should be noted that the recent Executive Order pertaining to the International Migratory Bird Treaty Act (E.O. 13186, published in the Federal Register January 17, 2001) instructs all federal agencies to take reasonable actions to minimize impacts on migratory birds. The order also instructs all federal agencies to establish MOUs with the U.S. Fish & Wildlife Service to achieve this goal. Most specifically, the U. S. Fish & Wildlife Service has determined that bird species included in Partners in Flight's Birds of Conservation Concern 2001 Report be deemed priorities for conservation actions by all federal agencies. Furthermore, these lists will be consulted prior to any actions taken on federal lands that may impact migratory bird habitat.

The Cerulean Warbler, along with 5 other species mentioned above in item (5), is considered by the USFWS as a "Species of Management Concern." Hence special efforts should be taken to avoid incidental federal actions that might result in the take of this and these other five species.

RECOMMENDATION:

The presence of breeding Cerulean Warblers—a state-listed species, and one being currently considered for federal listing— was not considered in the original MAP, nor has it been mentioned in this Addendum. This species has been present for four consecutive breeding seasons adjacent to the Natural Area and along the most probable access pathway to Parcel 4. Its presence further argues for altering the MAP to exclude the 45-acre Parcel 4 from development and to include it as part of the Natural Area.

Page-specific Comments

EA Addendum, page 8, lines 12-14. Is the study cited here the report known as the "Fluor Daniel study"? A reference citation should be provided.

EA Addendum, Section 3.1, page 8, lines 31-42. In addition to the land use changes mentioned here, this "Land Use" section should mention the designation of the North Boundary Greenway adjacent to Parcel ED-1.

EA Addendum, Section 3.4, pages 10-11. This section describes various utility upgrades "planned" by CROET, the city, or other entities. As local residents, we are aware that some of these "plans" are not yet budgeted by anyone, and probably could be called "long-range intentions" or "dreams." To help DOE decisionmakers and the public differentiate actual commitments to development from intentions that are contingent on other actions (such as CROET's hopes of obtaining additional DOE land for development in the future), please indicate who "plans" each of the upgrades that are mentioned and identify the source of the information. (Comment specifically applies to lines 24-25 on page 10, lines 6-7 on page 11, lines 13-15 on page 11, and lines 23-24 on page 11.)

MAP - Section 3.1.3. Page 11, paragraph 3 in section. It has been our understanding that the Horizon Center covenants require (not merely recommend) the use of native plants in landscaping. This is important for effective mitigation of ecological impacts. Therefore, revise the MAP to indicate that this is a requirement, not a recommendation.

MAP - Section 3.1.3. Page 11, paragraph 4 in section (next to last paragraph on page). We have observed that tall fescue, identified as an invasive pest plant species in Tennessee, has been planted in lawn areas of the Horizon Center in violation of mitigation requirements. In addition to stating that annual rye grass and clover should be used in revegetating construction sites, the MAP should specify that tall fescue is not to be planted in the future.

MAP - Section 3.1.3. Page 11, paragraph 5 in section (last paragraph on page). It appears that the only restorative action CROET would be required to take to protect the ecological/botanical integrity of the Natural Area would be to try to remove exotic/invasive plants encroaching on the sites of sensitive plant species. This is hardly sufficient to meet the objectives of the MAP. To be effective in protecting the integrity of the Natural Area, incursion and spread of exotic/invasive plants should be controlled throughout the Natural Area, not just in the vicinity of a few protected species.

REFERENCES CITED

Knight, R. L. 1999. The season report. *The Migrant* (A Quarterly Journal of Ornithology published by The Tennessee Ornithological Society):70:133.

Knight, R. L. 2000. The season report. *The Migrant* 71:122.

T.W.R.A. 2001 (Tennessee Wildlife Resources Agency). Partners in Flight Breeding Bird Survey for the Oak Ridge Reservation, May-June, 2001. Nashville, Tennessee.

Robert and Leigh Loveday and J. D. Joslin, 2002. Details: J.D. Joslin saw and heard an adult male Cerulean Warbler singing at approximately 9 a.m., May 27, on the North Boundary Trail of the Oak Ridge Reservation, approximately 100 m from East Fork Poplar Creek on the boundary of the MAP Exclusion Zone for Parcel ED-1. Robert and Leigh Loveday separately heard the same species singing on the same trail at

approximately noon of the same day (May 27). J. D. Joslin again saw and heard an adult male Cerulean Warbler at approximately 10:30 am, June 2, about 80 yards from the previous sighting on the same trail at the Exclusion Zone boundary and 20 yards from East Fork Poplar Creek. All sightings were reported on the Tennessee Birdwatchers Internet list-serve (tn-birds@freelist.com). (Partners in Flight, and most breeding surveys, consider that male birds singing during the period from May 20 to July 1 represent likely breeding birds marking a territory.)

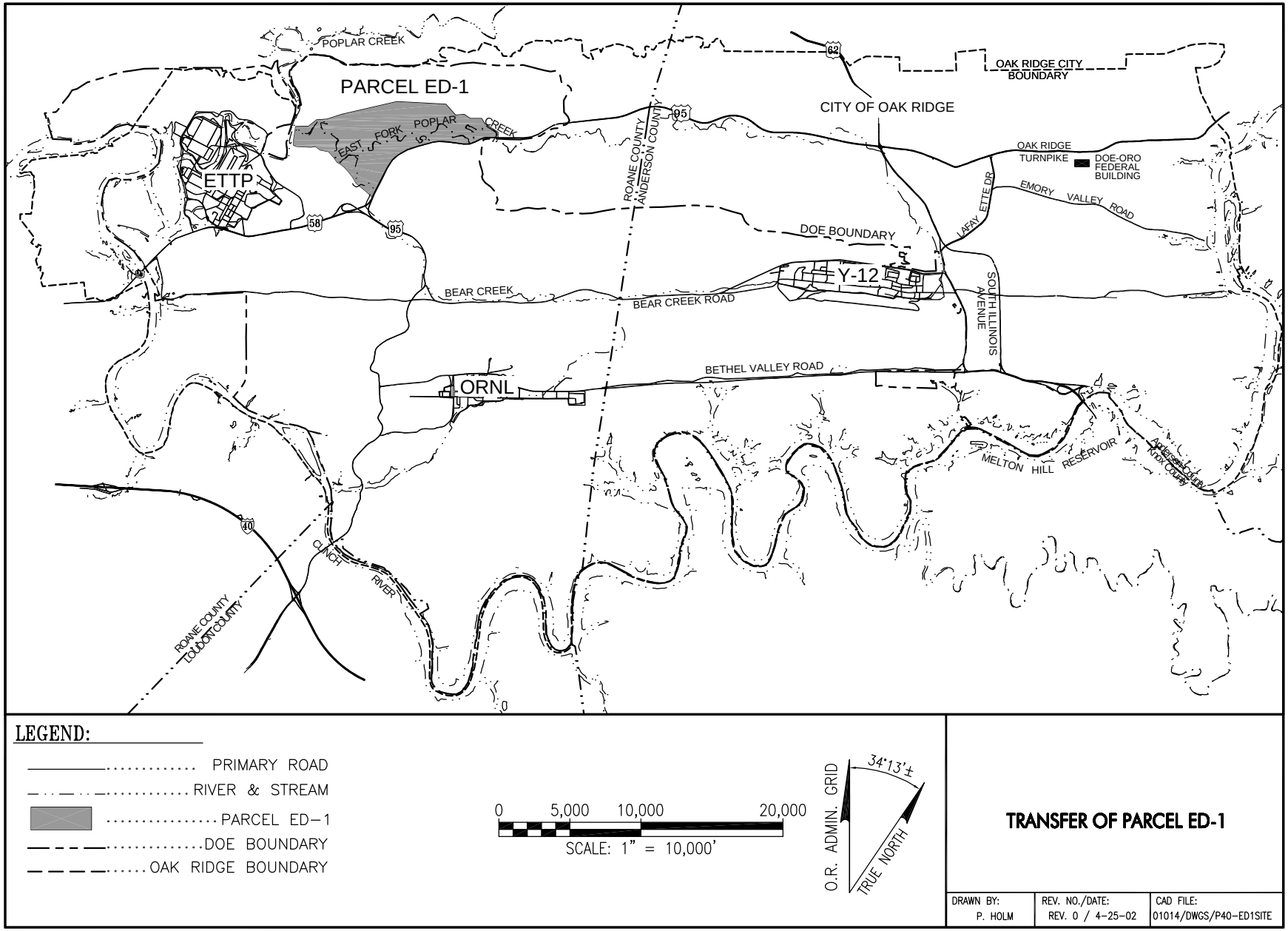
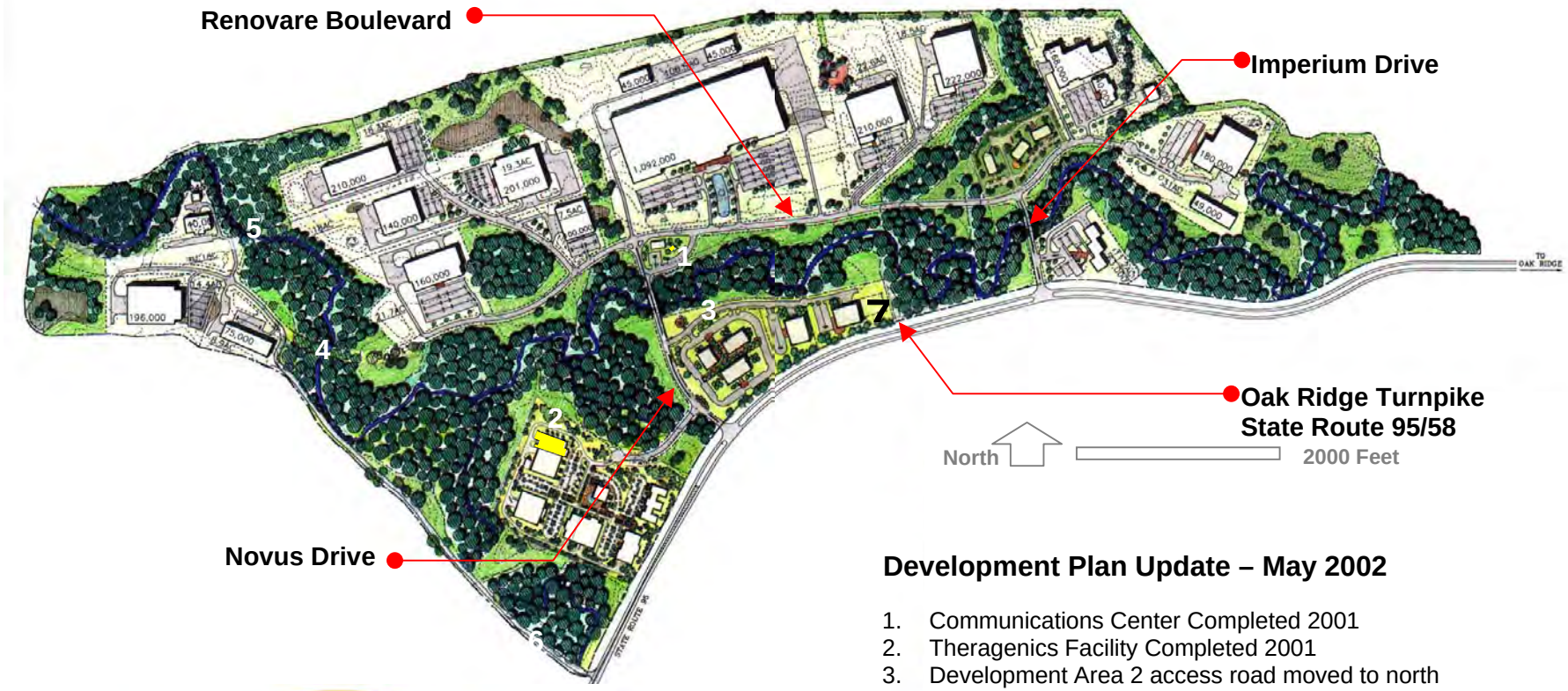


Fig. 1.1. Parcel ED-1 Vicinity Map



HORIZON CENTER
East Tennessee Technology Park

Development Plan Update – May 2002

1. Communications Center Completed 2001
2. Theragenics Facility Completed 2001
3. Development Area 2 access road moved to north boundary
4. West extension of Renovare Boulevard and bridge over East Fork Poplar Creek deleted
5. Railroad spur from west to Development Area 6 deleted
6. Access to western-most development area via upgraded patrol road added
7. Site at east end of Development Area 2 selected for speculative Technology Building

Fig. 1.2. Parcel ED-1 conceptual development plan.

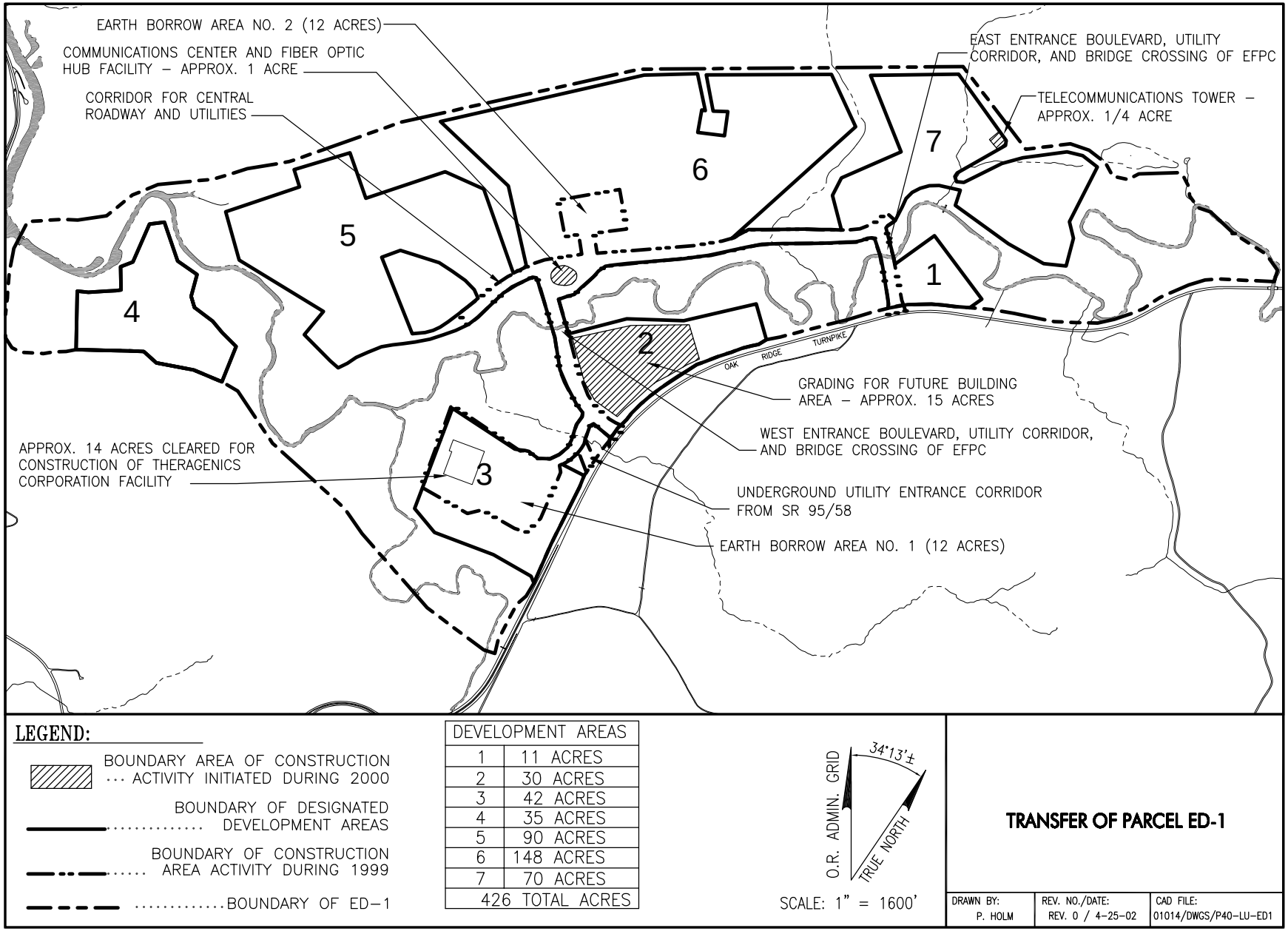


Fig. 1.3. Parcel ED-1 Construction Activities for 1999 and 2000.

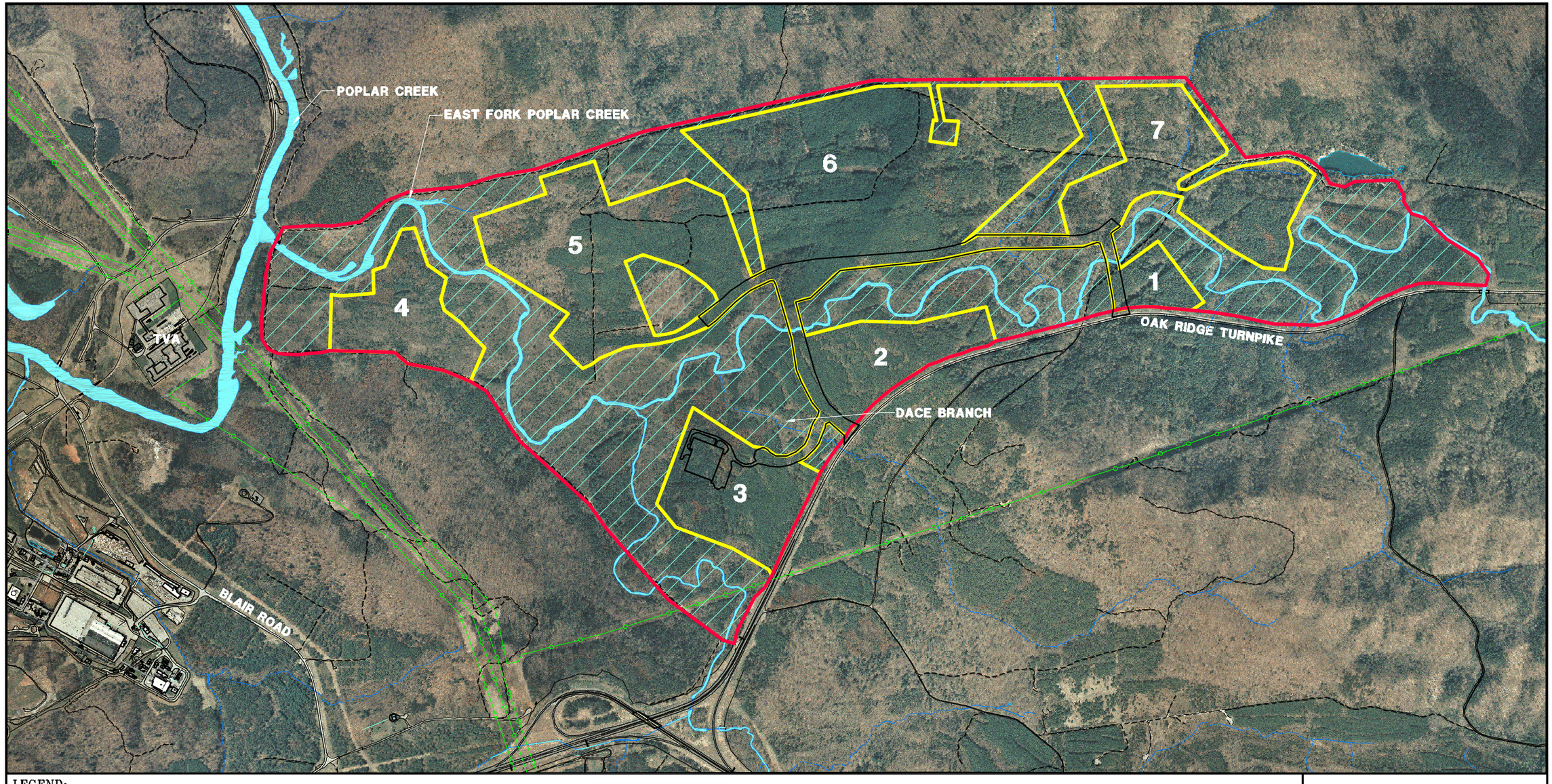


Fig. 2.1. Parcel ED-1 Development Areas and Natural Area

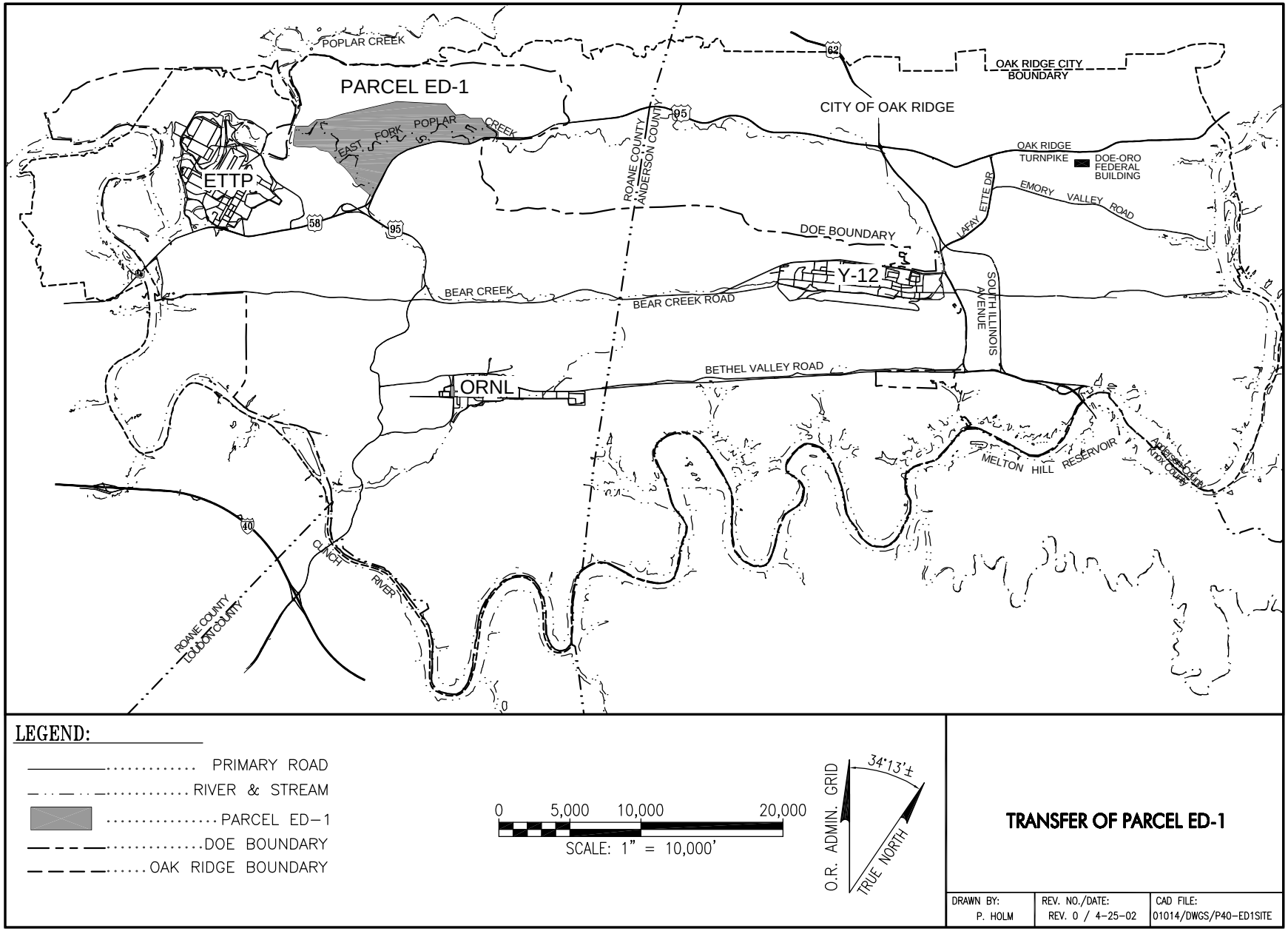


Fig. 1.1. Parcel ED-1 Vicinity Map

DOE/EA-1113-A

MITIGATION ACTION PLAN FOR THE PROTECTION OF THE NATURAL AREA ON PARCEL ED-1

April 2003

U.S. Department of Energy
Oak Ridge Operations
Oak Ridge, Tennessee

MITIGATION ACTION PLAN FOR THE PROTECTION OF THE NATURAL AREA ON PARCEL ED-1

Date Issued—April 2003

U.S. Department of Energy
Oak Ridge Operations

02-088(doc)/031903

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ACRONYMS

BMAP	Biological Monitoring and Abatement Program
CFR	*Code of Federal Regulations*
CROET	Community Reuse Organization of East Tennessee
DOE	U.S. Department of Energy
EA	Environmental Assessment
EFPC	East Fork Poplar Creek
EIS	Environmental Impact Statement
EPT	Ephemeroptera + Plecoptera + Trichoptera
FONSI	Finding of No Significant Impact
MAP	Mitigation Action Plan
NEPA	National Environmental Policy Act of 1969
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
ROW	right-of-way
SR	State Route
T&E	threatened and endangered
TDOT	Tennessee Department of Transportation
TWRA	Tennessee Wildlife Resources Agency

1. INTRODUCTION

In January 1996, the U.S. Department of Energy (DOE) executed a lease for the approximate 957-acre Parcel ED-1 to the Community Reuse Organization of East Tennessee (CROET) to develop an industrial/business park (now known as the Horizon Center). The lease subsequently became effective in April 1998. This action was preceded by an Environmental Assessment (EA) (DOE 1996a) resulting in a finding of no significant impact (FONSI), conditioned upon the implementation of mitigation and monitoring of the sensitive areas of Parcel ED-1. According to DOE's National Environmental Policy Act of 1969 (NEPA) regulations [10 *Code of Federal Regulations* (*CFR*) 1021.322], a FONSI shall include "*any commitments to mitigations that are essential to render the impacts of the proposed action not significant, beyond those mitigations that are integral elements of the proposed action, and a reference to the Mitigation Action Plan prepared under 10 CFR 1021.331*."

In accordance with the terms of the FONSI and as specified by 10 *CFR* 1021.331, a Mitigation Action Plan (MAP) was issued that described measures to be implemented to monitor and mitigate potentially significant adverse impacts that could occur from development on Parcel ED-1 (DOE 1996b). The MAP accomplished this by excluding areas of Parcel ED-1 from disturbance and development and requiring that surveys and monitoring be conducted on development areas prior to disturbance (pre-development) and during industrial operations (post-development). The objectives of these measures included: (1) protection of wildlife habitat, plant communities, threatened and endangered (T&E) species, water resources, wetlands, and historic and archaeological resources; (2) maintenance of habitat connections to reduce the ecological effects of fragmentation; (3) pre- and post-construction assessment of natural succession and impacts of development on natural communities and populations using data collected during monitoring; and (4) identification of additional mitigation, as needed, to remediate the actual adverse effects of development.

MAP objectives (1) and (2) were met by the establishment of a "Natural Area" (formerly referred to as the "Exclusion Area") within which no development (e.g., construction of habitable structures) should occur except for areas of unavoidable encroachment (i.e., roads and utilities). To meet objective (3), Oak Ridge National Laboratory (ORNL) initiated ecological surveys in June 1996. These surveys comprised the majority of the pre-development monitoring of the areas excluded from industrial development. MAP objective (4), to date, has focused on preventing the introduction of exotic species into Parcel ED-1. CROET in its Covenants, Conditions, and Restrictions for the parcel has provided a list with native plant recommendations and a list of invasive exotic pest plants in Tennessee. Owners and occupants are encouraged to use plants from the native list for landscaping and to avoid the plants on the other list. Additional mitigation (i.e., restoration and/or compensation) has not been necessary, since no damages or adverse impacts have occurred that would require such measures.

A requirement of the MAP is the preparation of Annual Reports by DOE to document baseline conditions in the Natural Area; survey data and monitoring status; and planning, construction, and operational phases of the development. The 1997 Annual Report (DOE 1977) documented pre-development conditions to use as a baseline, and it established monitoring sites for future use. At the request of DOE, CROET assumed responsibility for the preparation of future annual reports. CROET in turn contracted with Lockwood Greene Engineers, Inc. to complete the monitoring requirements of the MAP. The 1998 Annual Report (DOE 1998) described progress toward meeting objectives of the MAP during the site development planning and early construction phases. Specifically, the report addressed development alternatives, pre-development surveys, and monitoring plans during early construction.

A plan was developed to meet economic development goals while adhering to the commitments in the FONSI and the MAP. A main goal of the development plan was to maximize developable acreage while preserving the important ecological and scenic features of the parcel (Fig. 1.1). Planning and layout

of the site also relied heavily on several ecological studies designed to locate T&E species and to minimize the impact to stream and floodplain crossings. The objective of the 1999 and 2000 Annual Reports (DOE 1999 and 2000) was to meet the NEPA commitment to monitor specified environmental resources during early site construction and operation as development matured.

CROET awarded construction contracts for clearing right-of-ways (ROWs) for roads, utilities, borrow areas, and a sub-leased parcel soon after the lease was activated in the summer of 1998. Permits were obtained for construction of culverts and bridges in late 1998. Construction of the culverts and bridges began in late 1998 and continued to completion in 1999. Permits were obtained for sewer and water distribution systems in 1999. Construction began on the first sub-leased parcel (the Theragenics Center) in the summer of 1999. Grading and the foundation for the Theragenics building were completed by the last of November, and erection of steel began in December. A major emphasis in 2000 was directed toward completing road construction, installing underground utilities in the road ROWs, and completing construction on the Theragenics Center.

Three new sites were cleared and prepared for construction in 2000 (Fig. 1.2). The first of these was an addition to the Communications Center and fiber-optics hub facility located on about 1 acre near the middle of Parcel ED-1. A second was the erection of a new telecommunications tower on approximately 0.25 acre of the northwest sector of the parcel. The third involved clearing and grading of approximately 15 acres along the Oak Ridge Turnpike [State Route (SR) 95] adjacent to the west entrance to the parcel. Activities since 2000 have primarily been to clear brush and remove dead pines (due to the Southern pine beetle infestation) at the corner properties where the park roads intersect with the Oak Ridge Turnpike, and to conduct other routine maintenance activities.

On February 21, 2002, CROET submitted a proposal to DOE requesting the title transfer of Parcel ED-1. Following that on August 19, 2002, CROET submitted a supplement to its proposal requesting that the developable portion of Parcel ED-1 be transferred to Horizon Center LLC, a subsidiary of CROET. DOE initiated activities in March to meet the requirements necessary to support the title transfer, including reviewing and updating the NEPA documentation.

One of the first actions by DOE after receipt of CROET's proposal for the transfer of Parcel ED-1 was to convene a DOE peer review of the existing MAP. The Peer Review Team met in Oak Ridge on March 12–14, 2002. The goals of the Team were the following:

1. Assess the monitoring data collected to date and establish if the requirements of the MAP have been met.

2. Determine if changes to the MAP are warranted due to the intended future use of Parcel ED-1 and plans for activities adjacent to the parcel [e.g., Tennessee Department of Transportation (TDOT) expansion of SR 95].

3. Clarify the future monitoring and mitigation requirements, including defining when mitigation is necessary.

4. Identify when the next review of the MAP should be conducted.

DOE completed an EA Addendum (DOE/EA-1113-A) for the transfer of title of Parcel ED-1 to CROET. After review of the analysis, DOE issued a FONSI for the proposed action, conditioned upon the implementation of mitigation and monitoring to continue to protect environmental resources.

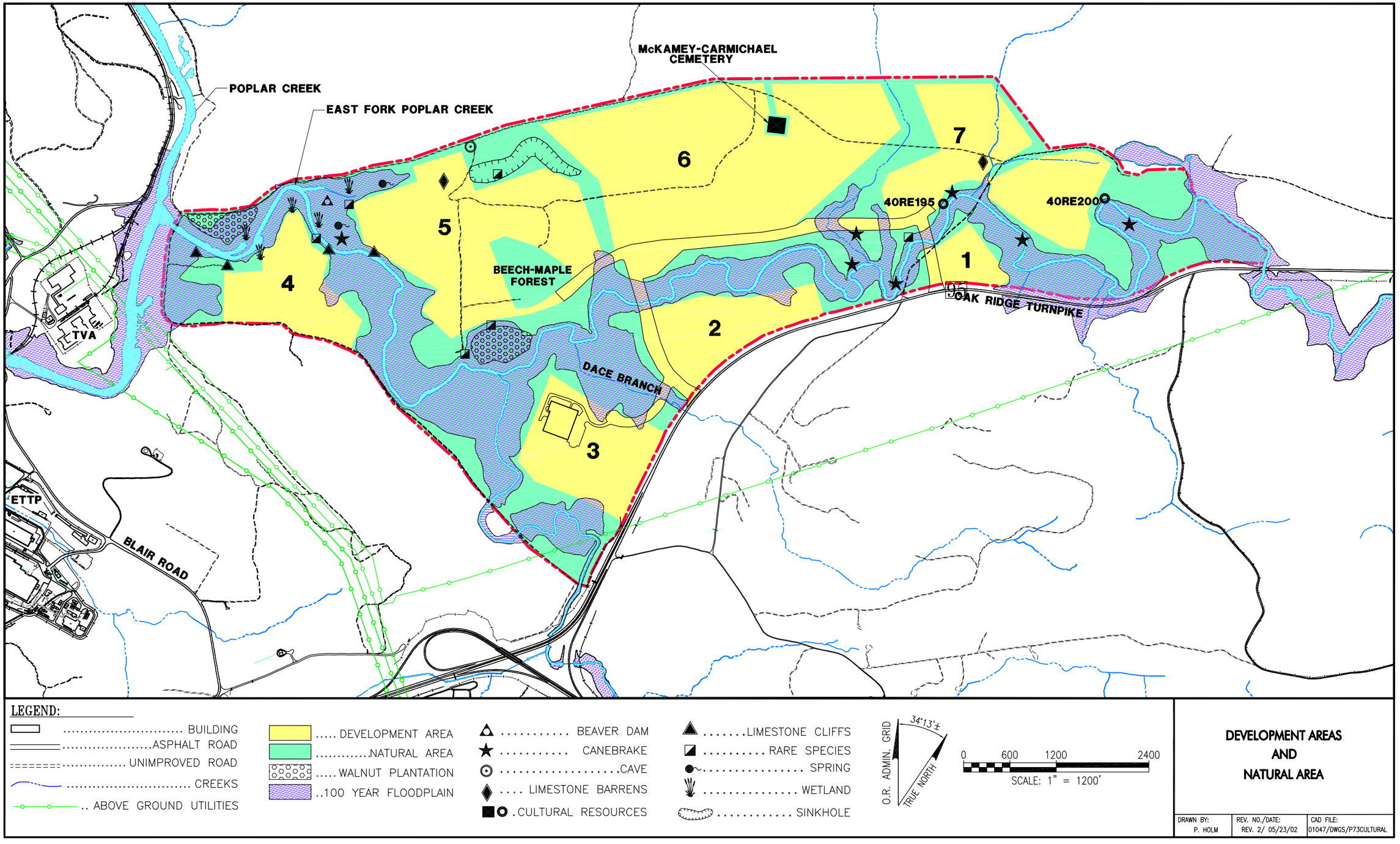

Fig. 1.1. Parcel ED-1 Development Areas and Natural Area

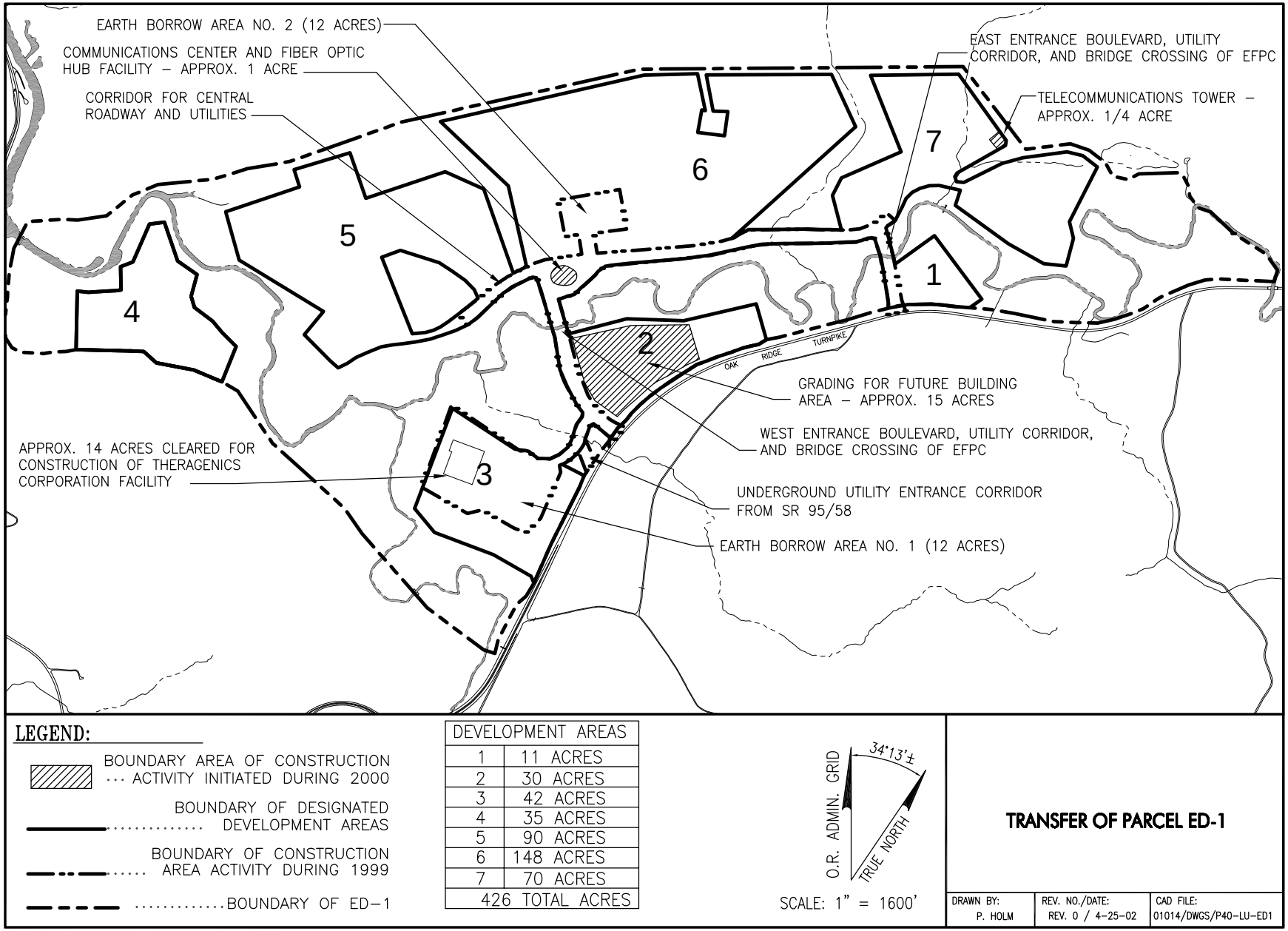

Fig. 1.2. Parcel ED-1 Construction Activities for 1999 and 2000.

The requirement that Horizon Center LLC monitor the Natural Area and perform mitigation of any of the sensitive resources within the Natural Area, if necessary, will be in the lease. If Horizon Center LLC fails to abide by the provisions of the lease within the specified cure period, then DOE and Horizon Center LLC may resolve the dispute subject to the dispute clause in the lease. Ultimately, DOE has the right of termination if the requirements are not met.

This MAP incorporates the recommendations of the DOE peer review. It also contains a summary and quantitative evaluation of monitoring data collected between 1996-2000, and monitoring requirements and mitigation measures for ecological and cultural resources. The objectives of these measures include: (1) to assess whether the integrity of the sensitive resources within the Natural Area is being maintained and to identify encroachments and any necessary maintenance or potential mitigation; (2) continuation of monitoring to detect and characterize changes from the baseline (pre-development) conditions and to determine if significant adverse impacts are occurring; and (3) mitigation, as needed, to help avoid, minimize, or remediate any adverse impacts to the sensitive areas. The MAP also contains a section describing review and reporting requirements.

Copies of this MAP may be reviewed at, and annual reports may be obtained from, the address listed below.

U.S. Department of Energy
Information Center
475 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830
Phone: (865) 241-4780 or 1-800-382-6938

2. DATA SUMMARY

Based on a recommendation from the peer review, DOE undertook a technical review of the existing data that have been collected on Parcel ED-1 to evaluate whether any significant adverse impacts have occurred and to provide the basis for the changes recommended in this revised MAP.

2.1 SUMMARY OF MONITORING ACTIVITIES

The previous MAP specified that post-development monitoring was to be conducted in the Natural Area and possibly off-site (e.g., north of the site) as development progressed. The monitoring plan included quarterly (seasonal) surveys by plant and wildlife ecologists in the Natural Area; triennial vegetation and wetland surveys; and annual monitoring of game populations (wild turkey, waterfowl, and deer), birds in the terrestrial ecosystem, and fish and benthic macroinvertebrates in the aquatic ecosystem. Monitoring surveys of birds, fish, and benthic macroinvertebrates were to be conducted annually. After a period of three years, the suitability of less frequent monitoring was to be re-evaluated.

The following table presents a summary of the ecological monitoring conducted by ORNL and Lockwood Greene between 1996 and 2000 (Table 2.1). The information and data were obtained from the DOE Annual Reports (1997–2000).

Table 2.1. Summary of ecological monitoring on Parcel ED-1

Monitoring Type	Year					Comments
	1996	1997	1998	1999	2000	
Terrestrial Vegetation	x	x	x	--	--	T&E, 5 sensitive communities, 5 common habitat-strata types
Birds	x	x	--	x	x	2 seasons, 2 routes
Fish	x	x	x	x	x	2 seasons, 4 stations
Benthic macroinvertebrates	x	x	x	x	x	2 seasons, 4 stations
Bats	--	x	--	--	--	47 net nights over 27 sites
Lepidoptera	--	x	--	--	--	3 sites
Mammals, Reptiles	--	x	--	--	--	16 sites, 6 habitat types
Amphibians	--	x	--	x	--	5 sites for 6 months
Game	--	x[a]	--	--	--	deer, turkey, duck, bobwhite

Source = Parcel ED-1 Annual Monitoring Reports (DOE 1997-2000).
[a] Data for animals harvested during hunting.
x = data collected.
-- = data not collected.
T&E = Threatened and endangered.

2.1.1 Terrestrial Ecosystem

2.1.1.1 Vegetation

Terrestrial vegetation for portions of Parcel ED-1 was quantitatively surveyed in 1996, 1997, and 1998.

Numbers of individual sensitive, rare, and/or protected plant species of different types were enumerated between June and September in 1996 and in May of 1997. The beech-maple forest (three sites) was surveyed in June 1997, resulting in estimates of abundance, basal area, density, and percent exotics. Two sections of the limestone cliffs on the parcel were qualitatively surveyed in July 1996 resulting in lists of native species and exotics. One site in the limestone barren was surveyed in July 1996; red cedars and other woody species of different sizes were enumerated, percent woody cover was estimated, and woody and exotic species were listed. Lists of dominant species in four Parcel ED-1 wetlands were made in July 1996. The percent cane cover was estimated for a canebrake site.

Ground cover, seedling/sapling/shrub habitat, floodplain forest, and upland forest were surveyed at numerous sites in May and June 1996. The number of species; total cover and percent exotics in ground cover; and total density of seedlings, saplings, and shrubs and percent exotics were measured at 18 sites. The number of individuals per species and basal area were measured at 12 floodplain forest sites and six upland forest sites. In 1998, lists of species were compiled for 12 areas to be cleared for road construction.

2.1.1.2 Birds

Birds were quantitatively surveyed in two seasons (spring and fall) along two monitoring routes (perimeter and floodplain) in each of the years 1996, 1997, 1999, and 2000. In each year, surveys were conducted identically using the point-count method (Hamel et. al. 1996) with 19 points along the periphery route and 25 points along the floodplain route. Additional counts were made of the number of species and individuals at two bridge sites located on the floodplain route.

2.1.1.3 Game species

DOE has monitored deer and wild turkey populations on the Oak Ridge Reservation (ORR), including Parcel ED-1, during controlled hunts managed by DOE and the Tennessee Wildlife Resources Agency (TWRA) since 1985. Hunting was discontinued on Parcel ED-1 starting in 1997, and no harvest records for the parcel are available since that time. No attempts have been made to quantify populations of whitetail deer, wild turkey, wood duck, mallard duck, and northern bobwhite. Only casual observations of these species have been reported.

Deer have continued to be observed on Parcel ED-1 and are common. They move over most of the parcel during non-work hours. Tracks of buck, doe, and young have been observed in roadways, clearings, and around water sources (DOE 2000).

Prior to the development of Parcel ED-1, the area provided prime habitat for wild turkey. The secondary succession resulting from pine beetle destruction of timber and the subsequent timbering operations reduced the area of prime habitat on the parcel. Construction activities during 1998–2000 further reduced the amount of habitat. Even with the reduction in habitat, wild turkey continue to be observed throughout the year, including several broods of young poults observed during spring 2000 (DOE 2000).

From 1993 to 1997, TWRA and ORNL staff conducted surveys from canoes in June for wood ducks on the lower reach of East Fork Poplar Creek (EFPC). Adults with young were observed in 3 out of 5 years, and lone adults were observed in each of the 5 years. While no canoe surveys were conducted in 1998 or 1999, lone adults were heard and seen on EFPC. Three breeding pairs were identified in spring 2000. Two groups of wood ducks were flushed during early December 2000, indicating they use EFPC as a winter habitat (DOE 2000).

Mallard ducks were not reported as occurring on Parcel ED-1 in the baseline census (DOE 1997) or the first census following the beginning of construction. However, in the spring census of 2000, breeding mallard ducks were reported on EFPC. They have also been heard and seen on other occasions throughout the year and, therefore, are considered a permanent resident on the parcel (DOE 2000).

Northern bobwhite is considered a declining species on the ORR (DOE 2000). This has also been true for the bobwhite population on Parcel ED-1. However, they were seen in the upland and floodplain habitats in the spring and summer of 2000. The increased open area and edge along with secondary succession may provide habitat that supports the recovery of this game bird on the parcel (DOE 2000).

2.1.1.4 Other species

Bats, moths, and butterflies (Lepidoptera), mammals, reptiles, and amphibians were quantitatively surveyed as part of the pre-development monitoring for T&E species, as specified by the MAP. Bats netted in June and July 1997 were identified to species and sexed. Two to four nets were set each night at a total of 27 sites over 16 nights (47 net nights total). Lepidopterans (butterflies, moths, and skippers) and their host plants were counted at three sites during 16 dates between June 24 and July 22 in 1997. The number of individuals and species of small mammals, reptiles, and amphibians observed or trapped during surveys of 16 sites distributed among six habitat types (bottomland forest, beech-maple forest, oak-hickory-ash limestone woodland, clearcut areas, limestone cliff area, and hardwood plantations) between March and July 1997 were recorded. The relative intensity of calling activity of different frog species was quantified once per month between March and August at five sites in 1997 and again in 1999. No T&E species were identified by those surveys.

2.1.2 Aquatic Ecosystem

Fish and benthic macroinvertebrates were surveyed in two seasons (spring and fall) at several stations within Parcel ED-1 in each of the years 1996 through 2000. Data collected by the Biological Monitoring and Abatement Program (BMAP) between 1984 and 2000 from stations on or near Parcel ED-1 supplemented the other data. Fish were sampled by electroshocking, and the identity, length, and weight of collected fish were recorded in one or more years. Benthics were sampled using a surber sampler and/or kick net with three or four replicates per site resulting in counts of individuals of different taxa, including chironomids and Ephemeroptera + Plecoptera + Trichoptera (EPT) taxa.

2.2 QUANTITATIVE EVALUATION OF MONITORING DATA

Quantitative monitoring data for terrestrial and aquatic ecosystems at Parcel ED-1 indicate few trends and no significant adverse impacts. The results of the trends analyses for birds, benthic macroinvertebrates, and fish monitoring data are presented in Appendix A and summarized below. Power tables presented in Appendix B can be used to estimate the statistical power of the data to detect trends. The results of the data evaluation and power tables were used to recommend revisions to the MAP and to meet the requirements of the FONSI (see Sect. 3.1.2).

2.2.1 Terrestrial Ecosystem

Trends in the vegetation data could not be evaluated because data were not collected in similar times of the year in more than 2 years at any site.

As specified in the MAP, birds were quantitatively surveyed in two seasons (spring and fall), along two routes (perimeter and floodplain), in each of the years 1996, 1997, 1999, and 2000 using identical survey methods. No significant trends ($Pr > 0.05$ that slope = 0) were detected in the total bird abundance and species richness, abundance of birds of conservation concern, and abundance of birds on the Partners in Flight National Watch List. The large increase in bird abundance and richness in 1997 is not explained by changes in survey methodology or personnel. ORNL personnel conducted both the 1996 and 1997 surveys using identical methods, and subsequent survey by Lockwood Greene used the same methods and level of effort.

Because there are data for two or fewer years, trends and impacts for bats, moths, and butterflies (Lepidoptera), mammals, reptiles, and amphibians could not be evaluated.

2.2.2 Aquatic Ecosystem

Fish and benthic macroinvertebrates were surveyed in two seasons (spring and fall) at several stations within Parcel ED-1 in each of the years 1996 through 2000 and between 1984 and 2000 from BMAP stations on or near Parcel ED-1. No significant trends were detected in benthic macroinvertebrate abundance, taxonomic richness, percent EPT, and average percent chironomids at Parcel ED-1 stations EFK2.3, EFK5.1, BCK0.1, and DBK0.3 (Appendix A). A significant trend of increasing total abundance was detected in the fall at BCK3.3, upstream of Parcel ED-1, between 1984 through 2000. Significant increasing trends in taxonomic richness and percent EPT were detected in the fall at stations EFK6.3 on Parcel ED-1 prior to construction (1985 through 1995) and in both spring and fall samples at BCK 3.3 (1984 through 2000). A significant trend of decreasing percent chironomids in the spring was detected at Dace Branch at Parcel ED-1 (DBK0.3) between 1997 and 2000. No significant trends were detected in fish density, taxonomic richness, percent generalist feeders, percent piscivores, and percent tolerant species at Parcel ED-1 stations EFK2.3, EFK5.1, BCK0.1, and DBK0.3 (Appendix A). Between 1988 and

2000, significant trends of increasing taxonomic richness and decreasing percent generalist feeders in both the spring and fall, and decreasing percent piscivores in the fall, were detected in data from BCK3.3 upstream of Parcel ED-1. A significant trend of increasing number of fish taxa in the fall season was detected at station EFK6.3 on Parcel ED-1 (1985 through 1999). The significant trends at individual stations, except decreasing piscivores at BCK3.3, are generally considered to be indicative of improving conditions. While increasing taxonomic richness at EFK6.3 in and of itself is not definitively indicative of improving conditions, the coincident increase in percent EPT indicates the direction of change in the community was generally positive.

3. MONITORING AND MITIGATION

3.1 ECOLOGICAL RESOURCES

3.1.1 Inspections

Horizon Center LLC will be responsible for conducting on-site inspections of the sensitive areas (Fig. 1.1) within the Natural Area boundary on Parcel ED-1 three times each year: December–January (before the ideal construction time), April–June (during flowering, nesting, and spring migrations), and September–October (following the prime construction period). The following areas will be inspected:

- perimeter boundary of the Natural Area,
- cave,
- sinkholes,
- canebrakes,
- springs,
- wetlands,
- rare species locations,
- east and west corridors,
- walnut plantations,
- beech-maple forest, and
- EFPC and Dace Branch buffer zones.

These inspections will be conducted to assess whether the integrity of the sensitive areas within the Natural Area is being maintained and to identify encroachments and any necessary maintenance or potential mitigation. The inspections will be conducted by qualified wildlife and plant biologists/ecologists who will observe and record the following:

- General condition of the vegetation within each area. Major changes or perturbations should be recorded (e.g., stressed vegetation or encroachment by exotic/invasive plant species).

- Observations of any wildlife.

- General condition of streams and springs (e.g., fish kills, excessive turbidity or sedimentation, oil sheens, foam, etc.).

During construction activities, Horizon Center LLC, or its designee, will conduct more frequent inspections of areas being disturbed to ensure that minimal encroachment of the Natural Area boundary is

occurring and that no significant adverse impacts occur. These inspections will be in addition to any other inspections that may take place by city or state officials (i.e., codes or other regulatory enforcement).

3.1.2 Monitoring

Monitoring was specified in the MAP (DOE 1996b) to detect and characterize changes from the baseline (pre-development) conditions. Sampling methods, intensity, and frequency specify the data quality objectives. The sampling method specified in the MAP (DOE 1996b) and natural variability at Parcel ED-1 determined the statistical confidence (alpha) and power to detect changes and trends of different magnitude. Sampling intensity and frequency should be reconsidered periodically based on the observed variability and potential to detect ecologically significant trends.

3.1.2.1 Birds

Given the power of current bird surveys to detect decreases in bird abundance and species richness, monitoring of birds will continue for at least 3 more years with the first of those 3 years to include the 2002 data already collected. Annual sampling conducted over this period of time (1996 through 2004) should detect a decrease of 5% per year in bird abundance and species richness, if it occurs, with a probability between 0.33 and 0.65 for total abundance and a probability greater than 0.65 for species richness. The bird surveys will be conducted in the spring, preferably during the months of May and June, which is the prime nesting season for most birds. The standard procedure that has been used for the previous surveys will continue to be used including the use of the two established routes (floodplain and periphery). This will ensure that the future data collected can be statistically compared with the historical data. The need for further monitoring can be evaluated using these data.

3.1.2.2 Amphibians

The peer review recommended that a baseline be established for amphibians in the planned wildlife corridors located on Parcel ED-1 (Fig. 1.1). CROET performed a survey of amphibians in 2002 (June-July). Methods used were consistent with those used during the pre-development surveys conducted in 1997 by ORNL (DOE 1997a) and included pitfall trap arrays and transects with and without drift fences, artificial covers, and active searches. All species either trapped or observed were recorded and the results will be presented in the next Annual Report. Additional monitoring of amphibians can be conducted by recording observations made during the on-site inspections, which include inspections of the wildlife corridors.

3.1.2.3 Benthic macroinvertebrates

Monitoring of benthic macroinvertebrates will continue. Benthic macroinvertebrates are likely more sensitive than fish to the potential impacts associated with development (e.g., siltation and water quality impairment) and, thus, will serve to indicate changes in the aquatic ecosystem. Benthic macroinvertebrates will be sampled once per year, in the spring. Monitoring will occur at upstream station EFK 6.3 and downstream station EFK 2.3. In accordance with the MAP (DOE 1996b) and recommendation of the peer review, the frequency of sampling is reduced to once per year because major adverse changes were not detected after 3 years of monitoring. A greater abundance and diversity of benthic macroinvertebrates and EPT taxa are expected in the spring than the fall. The method for conducting the benthic sampling will be the same as what has been used previously. The resulting data will allow analysis for trends in total abundance, taxonomic richness, percent EPT, and percent chironomids. Annual monitoring in the spring season will continue for at least 3 more years with the first of those 3 years to include the 2002 data already collected. Over 8 years, annual sampling should be able to detect a decrease of 5% per year in total abundance, richness, and percent EPT with a probability between 0.23 and 0.65. After a total of 8 years, the need for further monitoring can be re-evaluated using these data.

3.1.2.4 Fish

As recommended by the peer review, monitoring of the fish community in Dace Branch will continue. This is because it contains a reproducing population of the Tennessee dace, which is listed by the state as "Deemed In Need of Management."

Site preparation and construction activities during 1998 and 1999 resulted in exposing large areas of soil in the vicinity of Dace Branch. Two major storm events in the early spring of 1999 caused runoff to overrun the silt fence allowing sediments to enter Dace Branch, which may have adversely impacted the Tennessee dace. In fall 1998, the number of Tennessee dace was 19, a number higher than previously recorded (DOE 1998). In spring 1999, four individuals were found (DOE 1999). In October 1999, there were only two individuals, and none was found during the spring 2000 sampling (DOE 2000). A population of Tennessee dace was found upstream of the normal sampling location (DBK 0.3). This population was located upstream from influences of construction and downstream from culverts under the Oak Ridge Turnpike. These fish may repopulate the downstream reaches of Dace Branch as the stream recovers from the 1999 siltation events. Continued sampling will confirm recovery.

The Dace Branch will be sampled annually during the spring (April-May) for at least 3 more years (8 years total). The 2002 data already collected will be counted as the first of the 3 years. Annual sampling over 8 years should be able to detect a decrease of 5% per year in species richness with a probability greater than 0.88. After a total of 8 years, the need for further monitoring can be evaluated using these data.

3.1.3 Mitigation

The peer review recommended that the MAP clarify future mitigation requirements, including defining when mitigation is necessary. The Council on Environmental Quality *Regulations For Implementing The Procedural Provisions Of The National Environmental Policy Act* (40 *CFR* 1500-1508) defines mitigation as follows:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

DOE and CROET have already mitigated potential impacts to certain sensitive resources found on Parcel ED-1 by establishing the Natural Area. This action has served to avoid, minimize, reduce, and in many cases eliminate impacts to the sensitive resources found on the parcel. Horizon Center LLC will continue to be responsible for the preservation and maintenance of the integrity of the Natural Area, including the sensitive resources it contains.

Horizon Center LLC also will continue to provide mitigation by continuing to recommend that native plants be used for all revegetation of disturbed areas and landscaping of developed areas. These species should be native to the Ridge and Valley Province and consistent with local community types (see the

recommendation in the Horizon Center Covenants, Conditions, and Restrictions document). Lawn areas will also be kept to a minimum to the extent possible.

To help control erosion and sedimentation during land disturbing activities, best management practices like those described in the *Tennessee Erosion & Sediment Control Handbook* (TDEC 2002) will be used as appropriate. These best management practices can include vegetative practices (e.g., buffer zones and temporary vegetation), structural practices (e.g., silt fences, diversions, sediment basins) or a combination of both. In addition to the proper design and installation, any best management practices must also be properly maintained in order to effectively reduce erosion and sedimentation.

If, based on the tri-annual on-site inspections, it is determined that exotic/invasive plants (see Southeast Exotic Pest Plant Council http://www.exoticpestplantcouncil.org/) are encroaching into areas of sensitive plant communities [i.e., *Hydrastis canadensis* (goldenseal), *Cypripedium acaule* (pink lady-slipper), and *Panax quinquifolius* (ginseng)], Horizon Center LLC will make a good faith effort to eliminate the encroachment (a determination on the best method of removal will be made on a case-by-case basis). This maintenance will provide the mitigation needed to help reduce or eliminate potential impacts (i.e., degradation) to the sensitive plant communities.

Horizon Center LLC will be held responsible, under the terms of the Quitclaim deed and their lease, to ensure that they maintain the integrity of the Natural Area, and that they take appropriate measures to prevent significant adverse impacts to the sensitive resources within the Natural Area. Use of the Natural Area will be permitted as long as that use is non-intrusive and consistent with the natural environment (e.g., walking paths). Encroachment into the Natural Area for additional infrastructure development may be necessary and if so, it will be done in accordance with the appropriate regulations and the conditions specified in the lease. Construction of habitable structures within the Natural Area will be prohibited. Encroachment into the sensitive areas where federal or state-listed species are known to occur will be prohibited. If unanticipated impacts to the sensitive resources take place that could cause significant adverse impacts, especially those resources protected by law (e.g., wetlands, T&E species, and surface waters), Horizon Center LLC will be required to take mitigation measures, such as rehabilitation, restoration and/or compensation, as appropriate. Enforcement mechanisms are in the lease and the Quitclaim Deed in the event that Horizon Center LLC or any of its successors, transferees, or assigns fails to abide by their provisions. DOE will also be able to conduct mitigation within the Natural Area if it becomes necessary, since they will maintain ownership.

3.2 CULTURAL RESOURCES

Horizon Center LLC will be responsible for the continued protection of the McKamey-Carmichael cemetery and sites 40RE195 and 40RE200 (Fig. 1.1). Horizon Center LLC, or its designee, will conduct annual inspections of the perimeter of the McKamey-Carmichael cemetery and the 100-ft buffer zone around sites 40RE195 and 40RE200 to ensure that their integrity has not been compromised. Inspection results will be included in the Annual Reports.

If, during any development activities, an unanticipated discovery of cultural materials (e.g., human remains, pottery, bottles, weapon projectiles, and tools) or sites is made, all ground-disturbing activities in the vicinity of the discovery will be halted immediately. If the discovery is made on DOE-owned property then Horizon Center LLC will be responsible for immediately informing the DOE-Oak Ridge Operations Cultural Resources Management Coordinator. DOE will be responsible for contacting the Tennessee State Historic Preservation Office and the Eastern Band of Cherokee Indians Tribal Historic Preservation Office for completing consultation prior to any further disturbance of the discovery-site area. If on the other hand, the discovery is made on property where title has been transferred then the required consultations will be made by the property owner.

4. REVIEW AND REPORTING REQUIREMENTS

Prior to transferring title of the developable parcels, Horizon Center LLC will perform a review, using the information in the MAP and the Annual Reports, to determine if there is a potential for the property owner to significantly impact any of the sensitive resources found in the Natural Area. This review should occur prior to the following scenarios:

- A new occupant constructing on Parcel ED-1,
- A change to an existing operation that has the potential to adversely impact any sensitive resources contained within the Natural Area,
- A significant change to the habitat that is adjacent to Parcel ED-1 (e.g., TDOT expansion of SR 95),

The results of this review will be coordinated with the responsible DOE Program office. If there is the potential for a significant impact to a sensitive resource as determined by DOE or Horizon Center LLC, then it will be necessary to review the monitoring and mitigation requirements in the MAP to determine if changes are necessary. This MAP review will be conducted by DOE. Every effort will be made to conduct the MAP review in a timely manner. As a guideline, the review should take no more than 20 days to complete. The extent of the review will be based on the potential for impacts to sensitive resources. If additional time is required then this activity will be coordinated with the Horizon Center LLC to make sure that there is not an adverse impact to their schedule. At a minimum, the MAP should be reviewed once every 3 years to determine if modifications are necessary.

DOE will continue to publish Annual Reports on the implementation of the MAP. Copies of the annual reports will be placed in the DOE Information Center and a notice of availability will be made to the public.

5. REFERENCES

DOE (U.S. Department of Energy) 1996a. *Environmental Assessment – Lease of Parcel ED-1 of the Oak Ridge Reservation by the East Tennessee Economic Council,* DOE/EA-1113, April.

DOE 1996b. *Mitigation Action Plan – Lease of Parcel ED-1 of the Oak Ridge Reservation by the East Tennessee Economic Council,* DOE/EA-1113, April.

DOE 1997. *Annual Report – Implementation of Mitigation Action Plan for DOE/EA-1113: Lease of Parcel ED-1 of the Oak Ridge Reservation, Oak Ridge, Tennessee, Pre-Development Ecological Surveys,* DOE/EA-1113/MAP-97, November.

DOE 1998. *Annual Report – Implementation of Mitigation Action Plan for DOE/EA-1113: Lease of Parcel ED-1 of the Oak Ridge Reservation, Oak Ridge, Tennessee,* DOE/EA-1113/MAP-98, December.

DOE 1999. *Annual Report – Implementation of Mitigation Action Plan for DOE/EA-1113: Lease of Parcel ED-1 of the Oak Ridge Reservation, Oak Ridge, Tennessee,* DOE/EA-1113/MAP-99, December.

DOE 2000. *Annual Report – Implementation of Mitigation Action Plan for DOE/EA/1113: Lease of Parcel ED-1 of the Oak Ridge Reservation, Oak Ridge, Tennessee,* DOE/EA-1113/MAP-00, December.

Hamel, P.B., Smith, W.P., Twedt, D.J., Woehr, J.R., Morris, E., Hamilton, R.B., and Cooper, R.J., 1996. *A Land Manager's Guide to Point Counts of Birds in the Southeast,* Gen. Tech. Rep.

TDEC (Tennessee Department of Environment and Conservation) 2002. *Tennessee Erosion & Sediment Control Handbook: A Guide for Protection of State Waters through the use of Best Management Practices during Land Disturbing Activities,* available at http://www.state.tn.us/environment/wpc/sed_ero_controlhandbook/index.html. March.

6. GLOSSARY

Community Reuse Organization—A governmental or non-governmental organization that represents a community adversely affected by DOE work force restructuring, and that has the authority to enter into and fulfill the obligations of a DOE financial assistance agreement. For the Oak Ridge Operations office, CROET is this organization, and for Parcel ED-1 their subsidiary, Horizon Center LLC, is the transferee.

Environmental Assessment—A written environmental analysis that is prepared pursuant to NEPA to determine whether a federal action would significantly affect the environment and, thus require preparation of a more detailed Environmental Impact Statement (EIS).

Environmental Impact Statement—A document required of federal agencies by NEPA for major projects or legislative proposals significantly affecting the environment. A tool for decision-making, it describes the positive and negative effects of the undertaking and lists alternative actions.

Finding of No Significant Impact—A document prepared by a federal agency that presents the reasons why a proposed action would not have a significant impact on the environment and, thus would not require preparation of an EIS. A FONSI is based on the results of an EA.

Fragmentation—The disturbance or destruction of large contiguous areas of habitat into smaller, often isolated, portions or habitat patches.

Mitigation—Measures taken to reduce adverse impacts on the environment. According to 40 *CFR* 1508.20, mitigation includes: (1) avoiding an impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying an impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of an action; or (5) compensating for an impact by replacing or providing substitute resources or environments.

Natural Area—That portion of Parcel ED-1 formerly referred to as the Exclusion Area. The Natural Area contains important ecological and scenic features of the parcel (e.g., cave, springs, limestone cliffs, wetlands, rare and sensitive species and habitat, wildlife corridors, floodplain and stream buffer for EFPC and Dace Branch, and cultural resources).

Post-development—Occurring during site or facility development and/or construction and during industrial operations.

Pre-development—Prior to any site disturbance or construction activities. Pre-development monitoring was completed in 1996 and the results are included in the Annual Report published in 1997.

Sensitive Resources—Important ecological, cultural, and scenic features located within the portion of Parcel ED-1 referred to as the Natural Area and protected by a variety of regulations. These resources are shown on Figure 1.1 and include a cave, sinkholes, canebrakes, springs, wetlands, rare species locations, east and west wildlife corridors, walnut plantations, beech-maple forest, EFPC and Dace Branch buffer zones, and the McKamey-Carmichael cemetery.

Tri-annual—Occurring or being done 3 times per year.

Triennial—Occurring or being done once every 3 years.

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APPENDIX A
ADDITIONAL DATA SUMMARY

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Bird Monitoring Data

Data Sources

Data were obtained from Lockwood Green Technologies and hand entry from the ED-1 MAP reports. Lockwood Green data were received as Excel spreadsheets. These data included bird population survey counts for the periphery and floodplain routes from 1996 to 1999, excluding 1998. Data were hand entered into Excel spreadsheets from the 2000 MAP report.

Data Processing

SAS data analysis software was used to summarize and graph the data. The total number of birds was summed across each location, year, season and sampling route (Table 1). The number of species identified was also calculated across each location, year, season and sampling route (Table 1). These data for each location, season, and route were plotted by year to allow for a visual examination of temporal trends in the data (Figures 1 to 4).

Summary statistics were calculated for the total number of birds and the number of species for each season and sampling route (Tables 3 and 4). The summary statistics include the total number of samples, mean, standard deviation, coefficient of variation, maximum, minimum, and the probability for normality test. The coefficient of variation (CV) is the standard deviation divided by the mean and taken as a percent. The CV is a measure of the variability of the measurement. The probability for normality test is the probability for the Shapiro-Wilk test for determining if the data are different from a normal distribution. Data with probability values less than 0.05 would be considered significantly different from normal.

A simple linear regression analysis was performed for total number of birds versus year and the total number of species versus year to look for a simple linear increase or decrease in the ecological measurements over time. The regression tables contain the parameter estimates for the slope, standard error, probability, R-square, and 95% lower (LCL) and upper (UCL) confidence limits on the slope. Probability values less than the alpha level chosen indicate a statistically significant slope and, therefore, a statistically significant trend. The R-square value indicates how well the linear regression fits the measurements. R-square values close to 1.0 indicate a very good fit. R-square values close to zero indicate a poor fit.

Plots, summary statistics, and regression analyses were also computed for two subsets of the bird species: birds of conservation concern and birds on the PIF National Watch List (Figures 5 to 12 and Tables 6 to 12).

References

SAS®, 2001. Copyright (c) 1999-2001 by SAS Institute Inc., Cary, NC, USA.

Proprietary Software Release 8.2 (TS2M0)

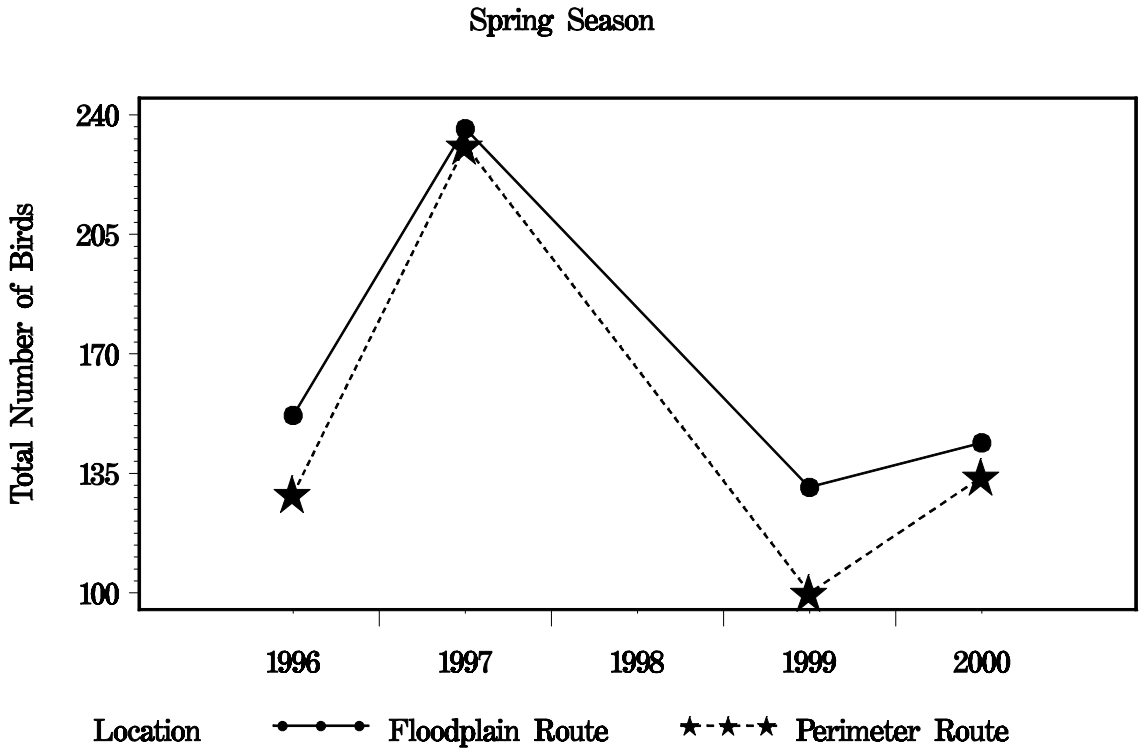

Figure 1. Number of birds counted at ED-1 during the Spring.

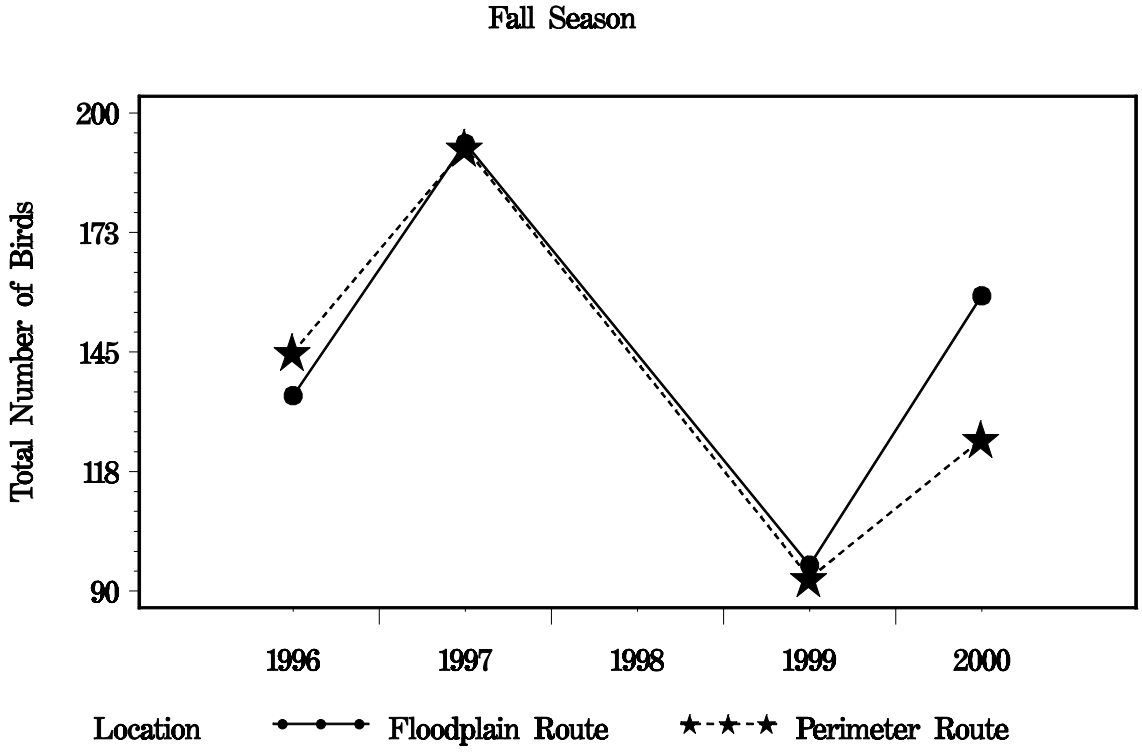

Figure 2. Number of birds counted at ED-1 during the Fall.

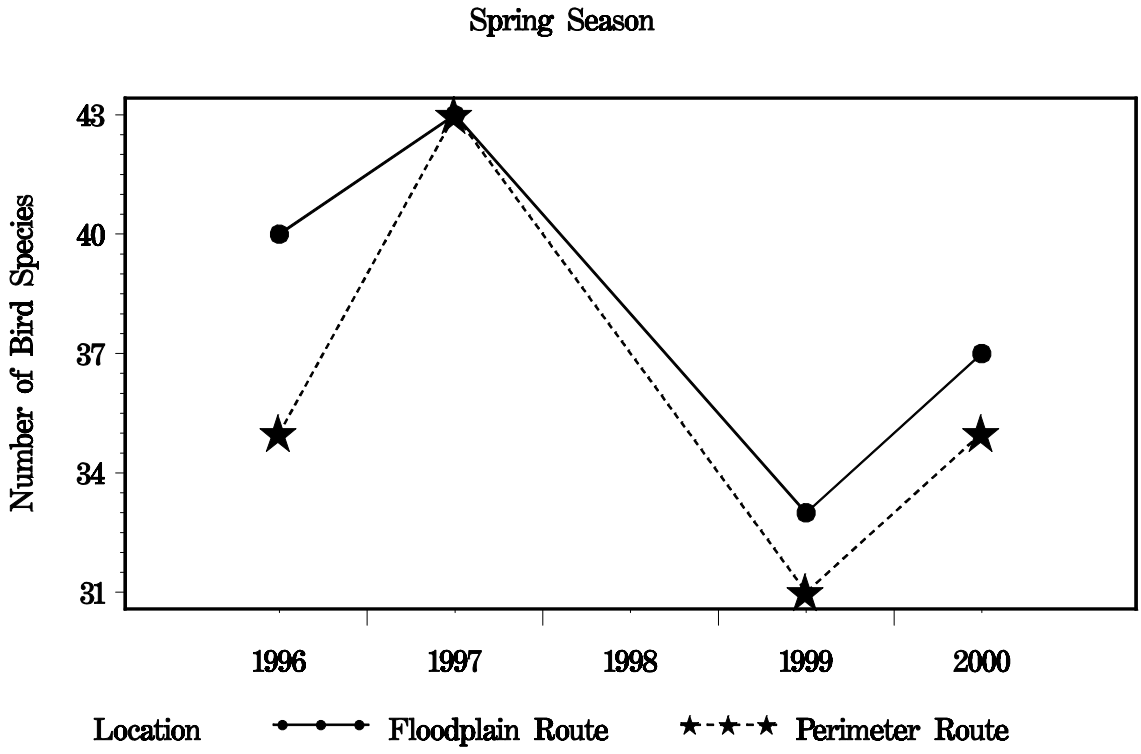

Figure 3. Number of bird species counted at ED-1 during the Spring.

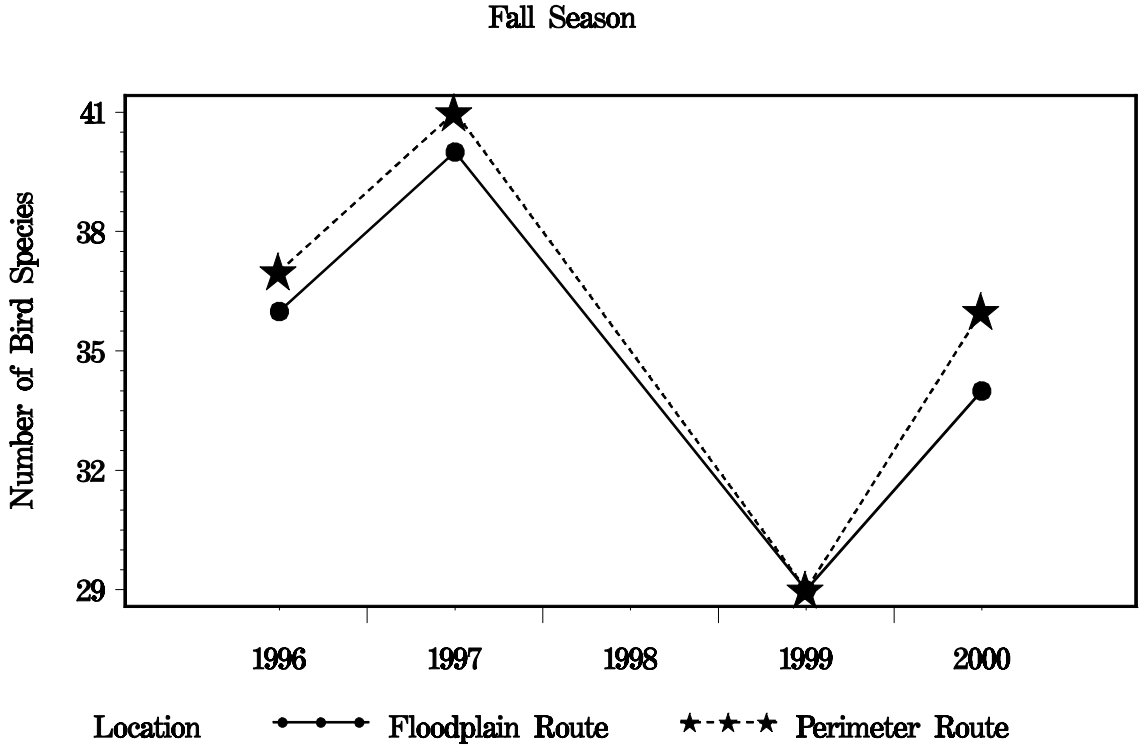

Figure 4 Number of bird species counted at ED-1 during the Fall.

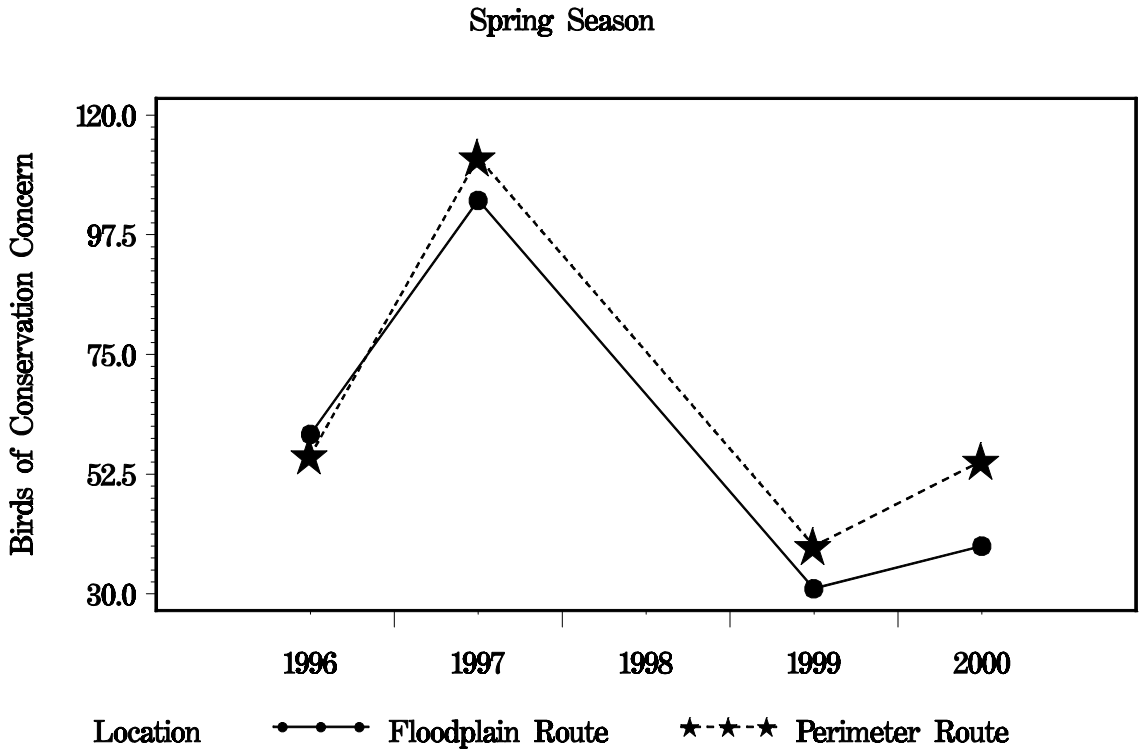

Figure 5. Number of birds counted of conservation concern at ED-1 in Spring.

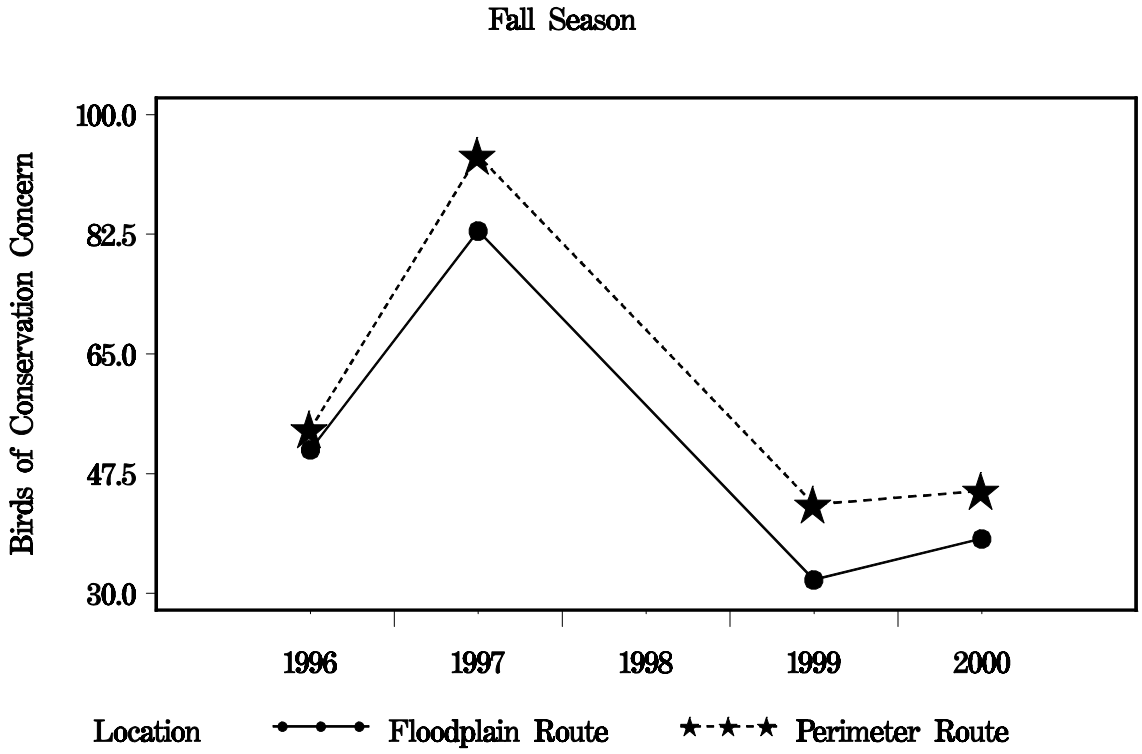

Figure 6. Number of birds counted of conservation concern at ED-1 in Fall.

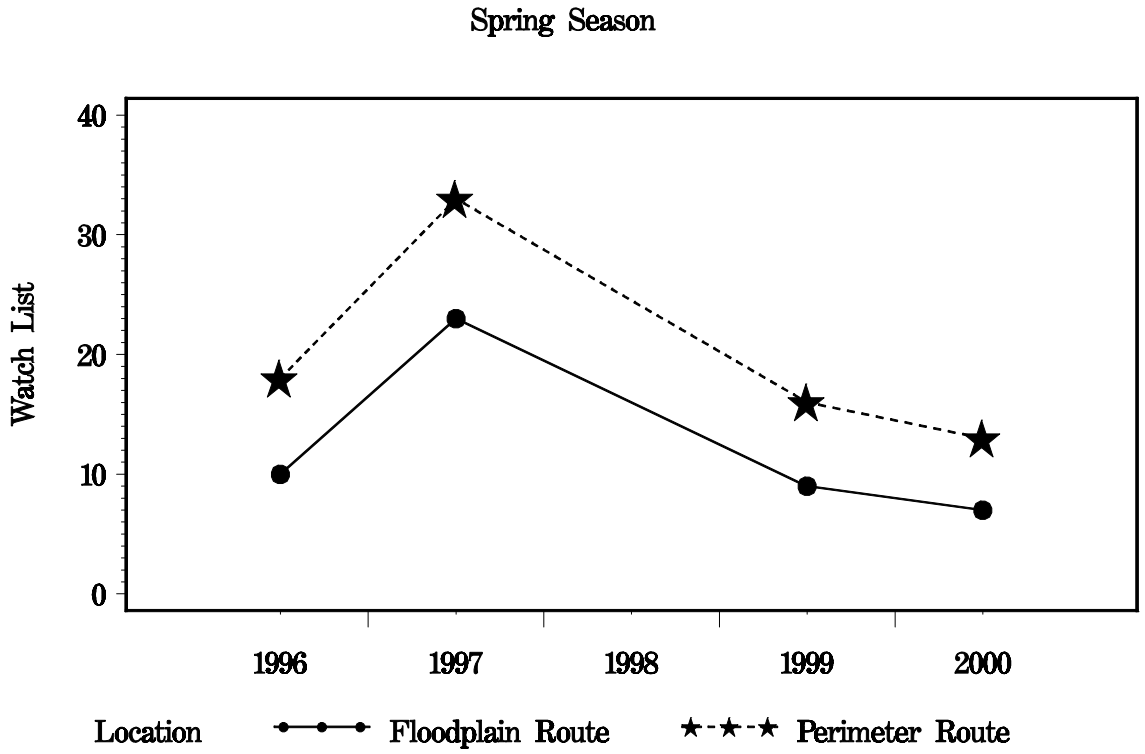

Figure 7. Number of birds counted on PIF Watch List at ED-1 in Spring.

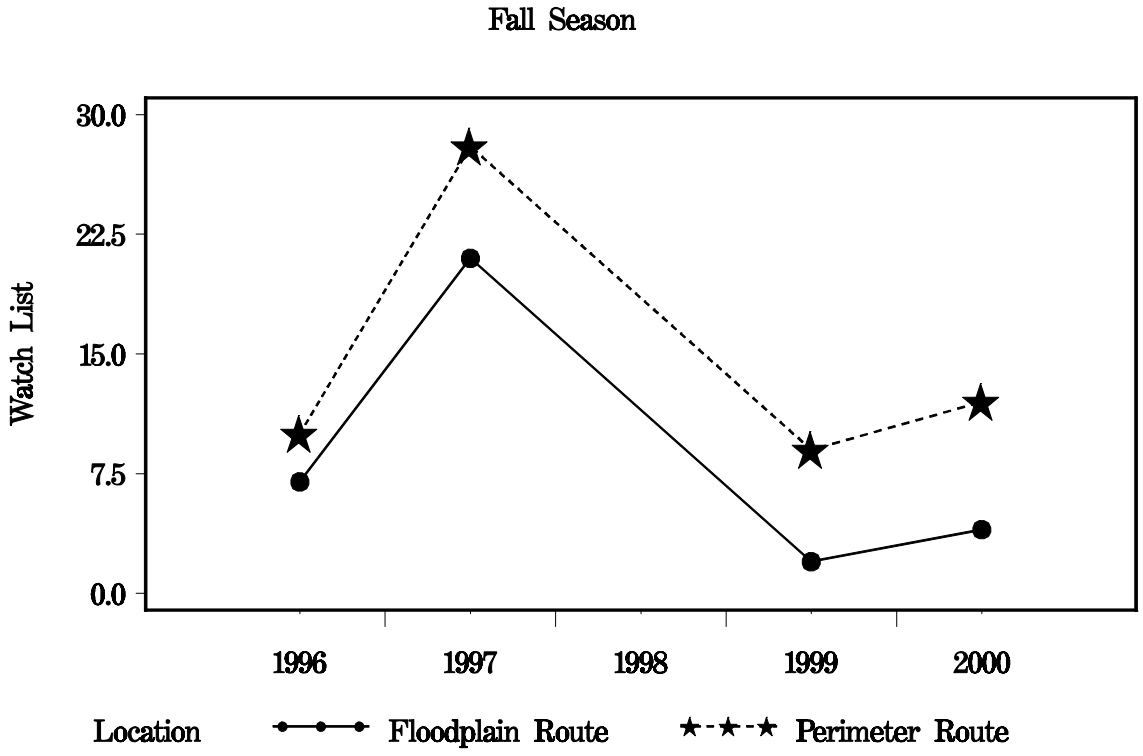

Figure 8. Number of birds counted on PIF Watch List at ED-1 in Fall.

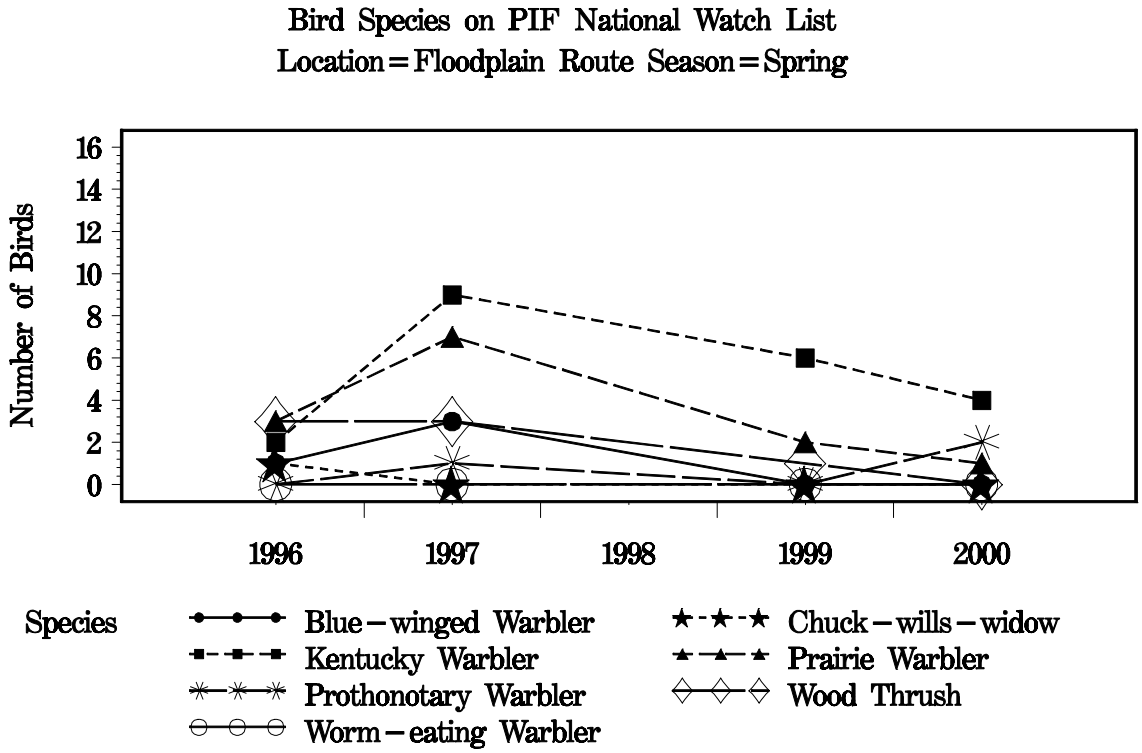

Figure 9. Number of birds counted on PIF Watch List at ED-1 in Spring by species on floodplain route.

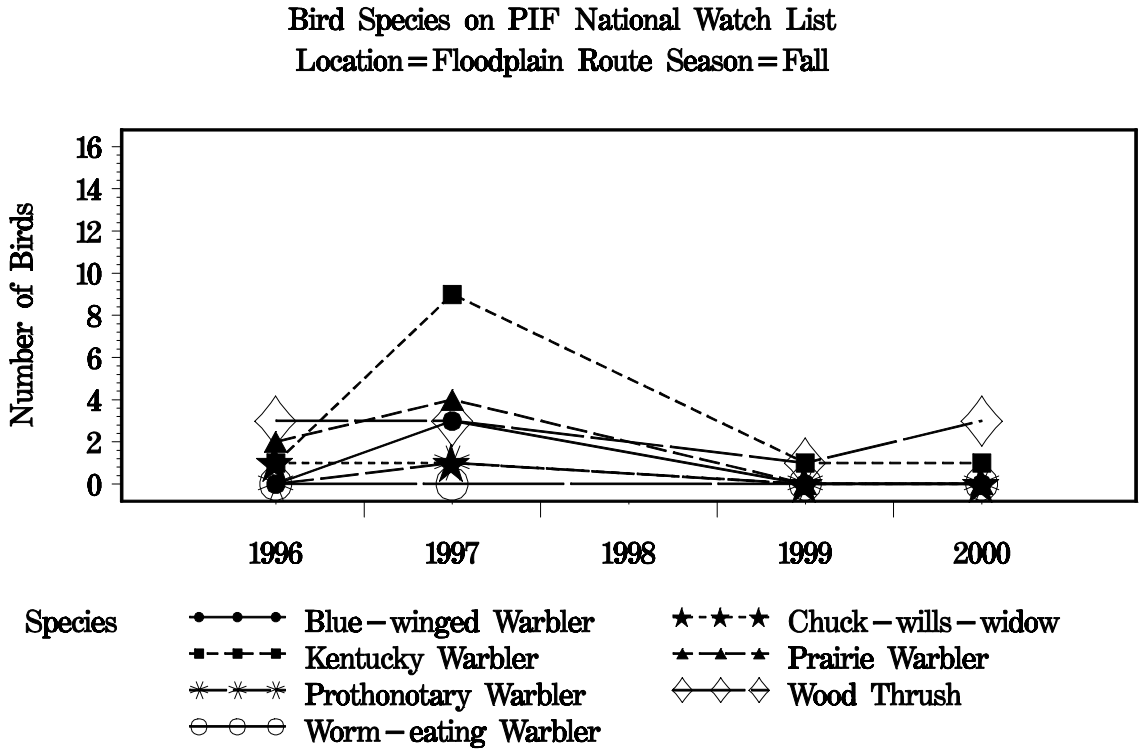

Figure 10. Number of birds counted on PIF Watch List at ED-1 in Fall by species on floodplain route.

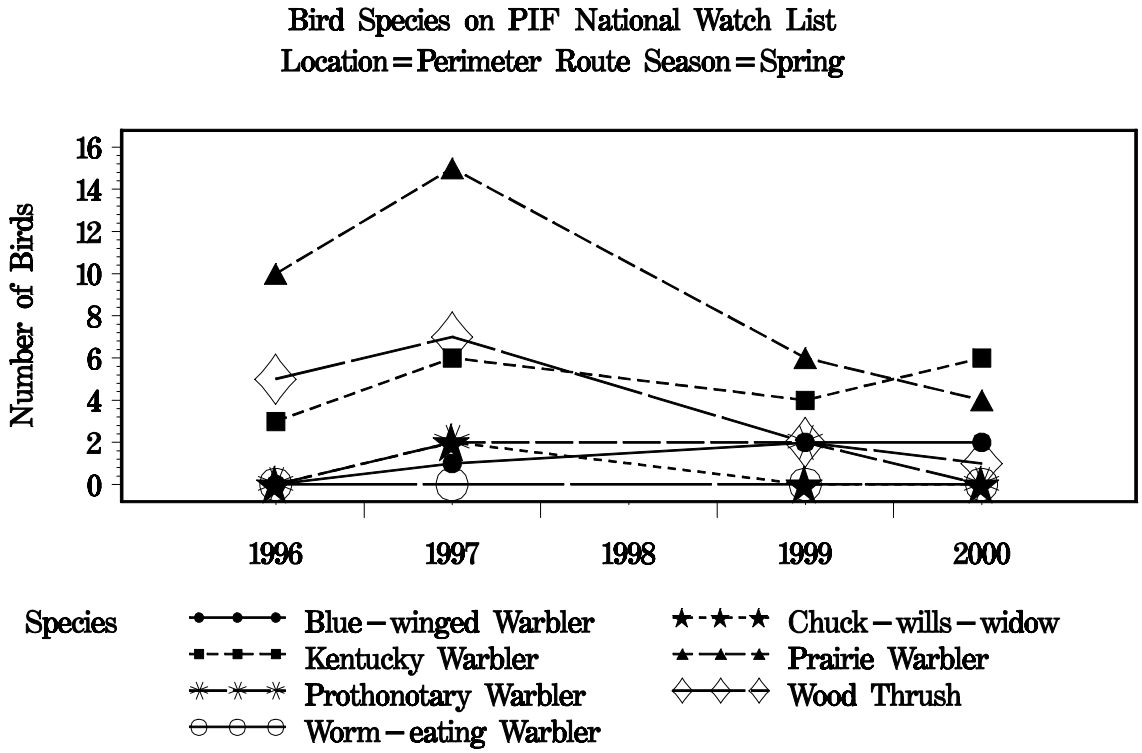

Figure 11. Number of birds counted on PIF Watch List at ED-1 in Spring by species on perimeter route.

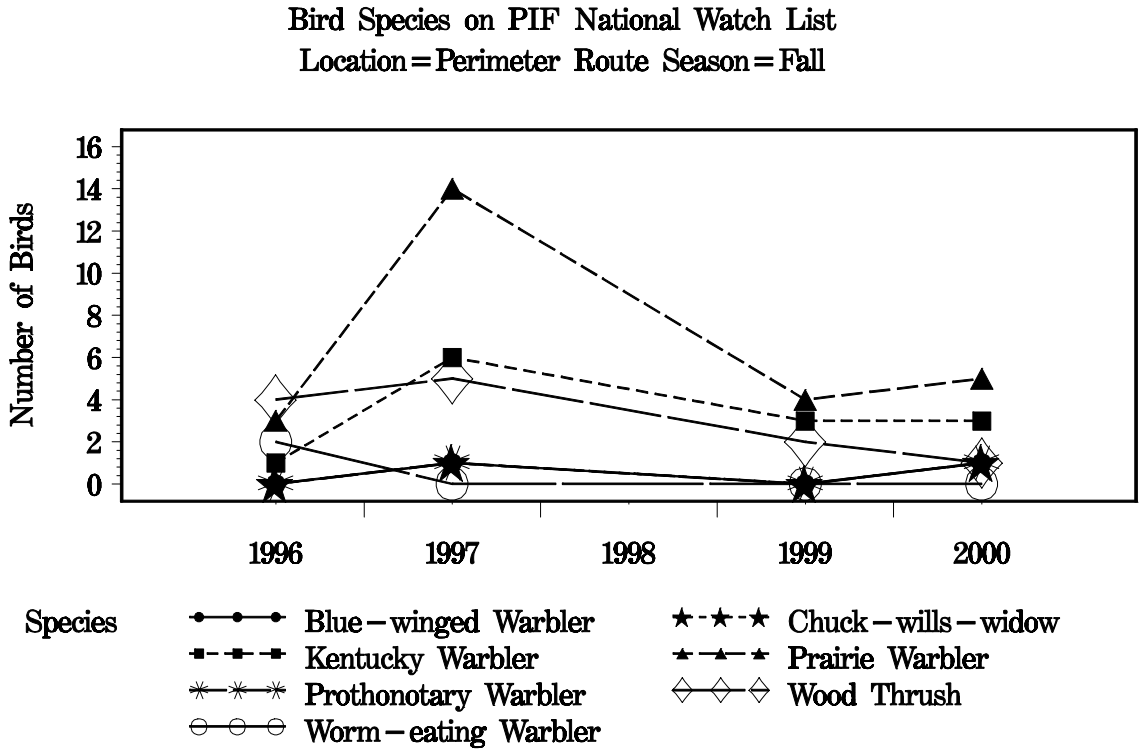

Figure 12. Number of birds counted on PIF Watch List at ED-1 in Fall by species on perimeter route.

Table 1. Total Numbers of Birds and Species by Locations, Seasons, and Year 1996-2000

Location	Year	Season	Total Birds	Total Species
Floodplain Route	1996	Spring	152	40
Floodplain Route	1997	Spring	236	43
Floodplain Route	1999	Spring	131	33
Floodplain Route	2000	Spring	144	37
Floodplain Route	1996	Fall	135	36
Floodplain Route	1997	Fall	193	40
Floodplain Route	1999	Fall	96	29
Floodplain Route	2000	Fall	158	34
Perimeter Route	1996	Spring	129	35
Perimeter Route	1997	Spring	231	43
Perimeter Route	1999	Spring	100	31
Perimeter Route	2000	Spring	134	35
Perimeter Route	1996	Fall	145	37
Perimeter Route	1997	Fall	192	41
Perimeter Route	1999	Fall	93	29
Perimeter Route	2000	Fall	125	36

Table 2. Summary Statistics for Total Birds 1996-2000

Season	Location	Total Number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for normality
Spring	Floodplain Route	4	165.75	47.6261	28.7337	236	131	0.79375
Spring	Perimeter Route	4	148.50	57.0058	38.3878	231	100	0.84687
Fall	Floodplain Route	4	145.50	40.7145	27.9824	193	96	0.99917
Fall	Perimeter Route	4	138.75	41.4598	29.8810	192	93	0.98766

Table 3. Summary Statistics for Total Species 1996-2000

Season	Location	Total number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for normality
Spring	Floodplain Route	4	38.25	4.27200	11.1686	43	33	0.99253
Spring	Perimeter Route	4	36.00	5.03322	13.9812	43	31	0.89495
Fall	Floodplain Route	4	34.75	4.57347	13.1611	40	29	0.99271
Fall	Perimeter Route	4	35.75	4.99166	13.9627	41	29	0.94698

Table 4. Summary Regression Table for Total Birds 1996-2000

Location	Season	Parameter Estimate	Standard Error	Pr > |t|	R-Square	LCL	UCL
Floodplain Route	Spring	-12.10000	16.34113	0.5361	0.2152	-82.4102	58.2102
Floodplain Route	Fall	-5.10000	15.35073	0.7713	0.0523	-71.1489	60.9489
Perimeter Route	Spring	-12.10000	20.35301	0.6125	0.1502	-99.6719	75.4719
Perimeter Route	Fall	-13.90000	12.69774	0.3879	0.3747	-68.5339	40.7339

Table 5. Summary Regression Table for Total Species 1996-2000

Location	Season	Parameter Estimate	Standard Error	Pr > |t|	R-Square	LCL	UCL
Floodplain Route	Spring	-1.60000	1.20727	0.3162	0.4676	-6.7945	3.5945
Floodplain Route	Fall	-1.50000	1.41863	0.4012	0.3586	-7.6039	4.6039
Perimeter Route	Spring	-1.20000	1.75499	0.5647	0.1895	-8.7511	6.3511
Perimeter Route	Fall	-1.40000	1.66057	0.4879	0.2622	-8.5449	5.7449

Table 6. Total Number of Birds of Conservation Concern and Total Number Birds on the PIF National Watch List, 1996-2000.

Location	Year	Season	Birds of Conservation Concern	PIF National Watch List
Floodplain Route	1996	Spring	60	10
Floodplain Route	1997	Spring	104	23
Floodplain Route	1999	Spring	31	9
Floodplain Route	2000	Spring	39	7
Floodplain Route	1996	Fall	51	7
Floodplain Route	1997	Fall	83	21
Floodplain Route	1999	Fall	32	2
Floodplain Route	2000	Fall	38	4
Perimeter Route	1996	Spring	56	18
Perimeter Route	1997	Spring	112	33
Perimeter Route	1999	Spring	39	16
Perimeter Route	2000	Spring	55	13
Perimeter Route	1996	Fall	54	10
Perimeter Route	1997	Fall	94	28
Perimeter Route	1999	Fall	43	9
Perimeter Route	2000	Fall	45	12

Table 7. Summary Statistics for Total Birds of Conservation Concern.

Season	Location	Total number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for normality
Spring	Floodplain Route	4	58.5	32.7058	55.9073	104	31	0.89740
Spring	Perimeter Route	4	65.5	31.9635	48.7993	112	39	0.82668
Fall	Floodplain Route	4	51.0	22.7596	44.6267	83	32	0.89112
Fall	Perimeter Route	4	59.0	23.8188	40.3708	94	43	0.78479

Table 8. Summary Statistics for Birds on the PIF National Watch List.

Season	Location	Total number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for normality
Spring	Floodplain Route	4	12.25	7.27438	59.383	23	7	0.78490
Spring	Perimeter Route	4	20.00	8.90693	44.535	33	13	0.83273
Fall	Floodplain Route	4	8.50	8.58293	100.976	21	2	0.83164
Fall	Perimeter Route	4	14.75	8.92095	60.481	28	9	0.75104

Table 9. Summary Regression Table for Birds of Conservation Concern.

Location	Season	Parameter Estimate	Standard Error	Pr > |t|	R-Square	LCL	UCL
Floodplain Route	Spring	-11.50000	9.71211	0.3580	0.4121	-53.2878	30.2878
Floodplain Route	Fall	-7.70000	6.93217	0.3823	0.3815	-37.5267	22.1267
Perimeter Route	Spring	-7.50000	11.18593	0.5716	0.1835	-55.6292	40.6292
Perimeter Route	Fall	-6.90000	7.82911	0.4711	0.2797	-40.5860	26.7860

Table 10. Summary Regression Table for Birds on the PIF National Watch List.

Location	Season	Parameter Estimate	Standard Error	Pr > |t|	R-Square	LCL	UCL
Floodplain Route	Spring	-2.00000	2.43670	0.4980	0.2520	-12.4843	8.4843
Floodplain Route	Fall	-2.50000	2.81514	0.4682	0.2828	-14.6126	9.6126
Perimeter Route	Spring	-2.70000	2.87315	0.4466	0.3063	-15.0622	9.6622
Perimeter Route	Fall	-1.50000	3.28824	0.6930	0.0942	-15.6481	12.6481

Benthic Macroinvertebrate Monitoring Data

Data Sources

Data were obtained from three sources: OREIS, Lockwood Green Technologies, and hand entry from the ED-1 MAP reports. OREIS data were received as a tab-delimited ASCII file queried from the OREIS database. The OREIS data included the population surveys of benthic macroinvertebrates at EFK 6.3 from 1985 through 1999 and at BCK3.3 from 1984 through 2001. Lockwood Green data were received as Excel spreadsheets. These data included benthic macroinvertebrate surveys from 1998 to 2000. Data were hand entered into Excel spreadsheets from the 1997 MAP reports.

Data Processing

SAS data analysis software was used to summarize and graph the data. The total number of benthic organisms was summed across each location, year, season and sampler. From 3 to 5 surber samplers were used at each location and sampling event. From the sum per sampler, the average number of organisms and taxa per sample were computed (Table 1). The taxa included in the Ephemeroptera, Tricoptera, and Plecoptera (EPT) orders of insects were identified. The total number of organisms in these three orders was summed for each sample and the average was used to calculate the percent EPT organisms for each location and sampling event (Table 1). The percent of chironomid organisms was calculated in a similar manner (Table 1). These data for each location, season, were plotted by year to allow for a visual examination of temporal trends in the data (Figures 1 to 12).

Summary statistics were calculated for the average number of organisms per sample and the average number of taxa per sample for each season and location (Tables 2 and 3). The summary statistics include the total number of samples, mean, standard deviation, coefficient of variation, maximum, minimum, and the probability for normality test. The coefficient of variation (CV) is the standard deviation divided by the mean and taken as a percent. The CV is a measure of the variability of the measurement. The probability for normality test is the probability for the Shapiro-Wilk test for determining if the data are different from a normal distribution. Data with probability values less than 0.05 would be considered significantly different from normal.

A simple linear regression analysis was performed for the average number of benthic organisms versus year and the average number of taxa versus year to look for a simple linear increase or decrease in the ecological measurements over time. The regression tables contain the parameter estimates for the slope, standard error, probability, R-square, and 95% lower (LCL) and upper (UCL) confidence limits on the slope. Probability values less than the alpha level chosen indicate a statistically significant slope and, therefore, a statistically significant trend. The R-square value indicates how well the linear regression fits the measurements. R-square values close to 1.0 indicate a very good fit. R-square values close to zero indicate a poor fit (Tables 4 and 5).

Plots (Figures 9 to 12), summary statistics (Tables 6 and 7), and regression analyses (Tables 8 and 9) were also computed for the percent EPT and percent chironomid data.

References

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Proprietary Software Release 8.2 (TS2M0)

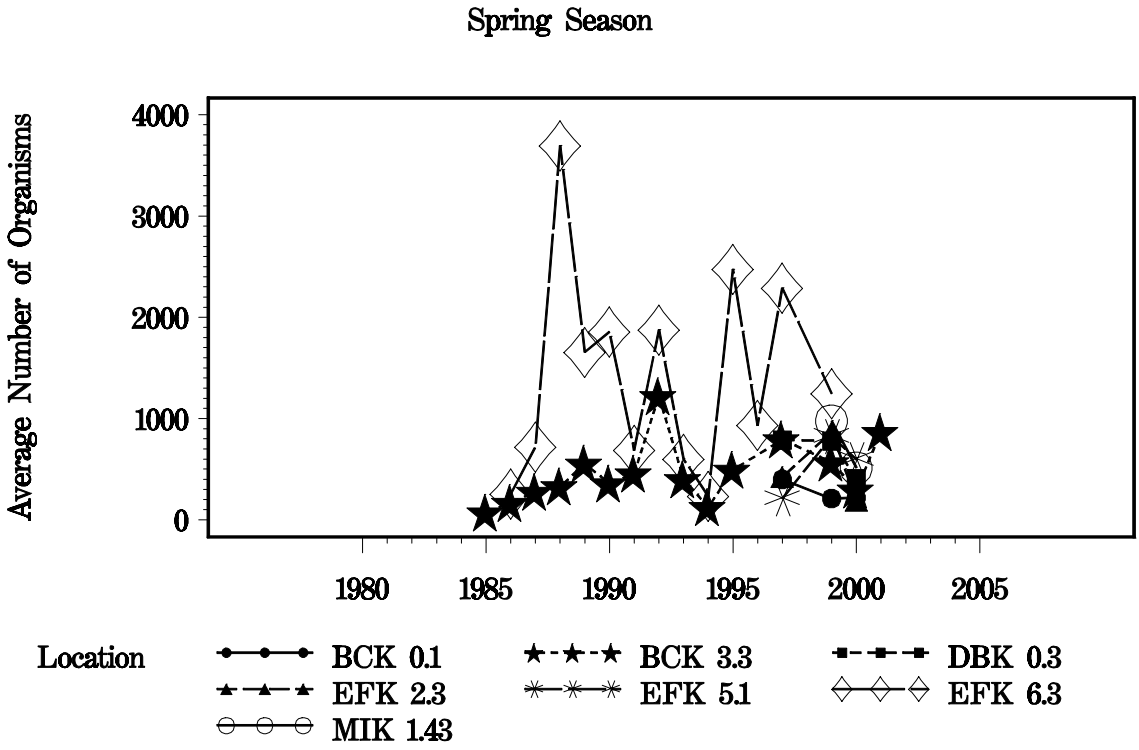

Figure 1. Average number of benthic organisms per sample for the Spring sampling events 1985-2001.

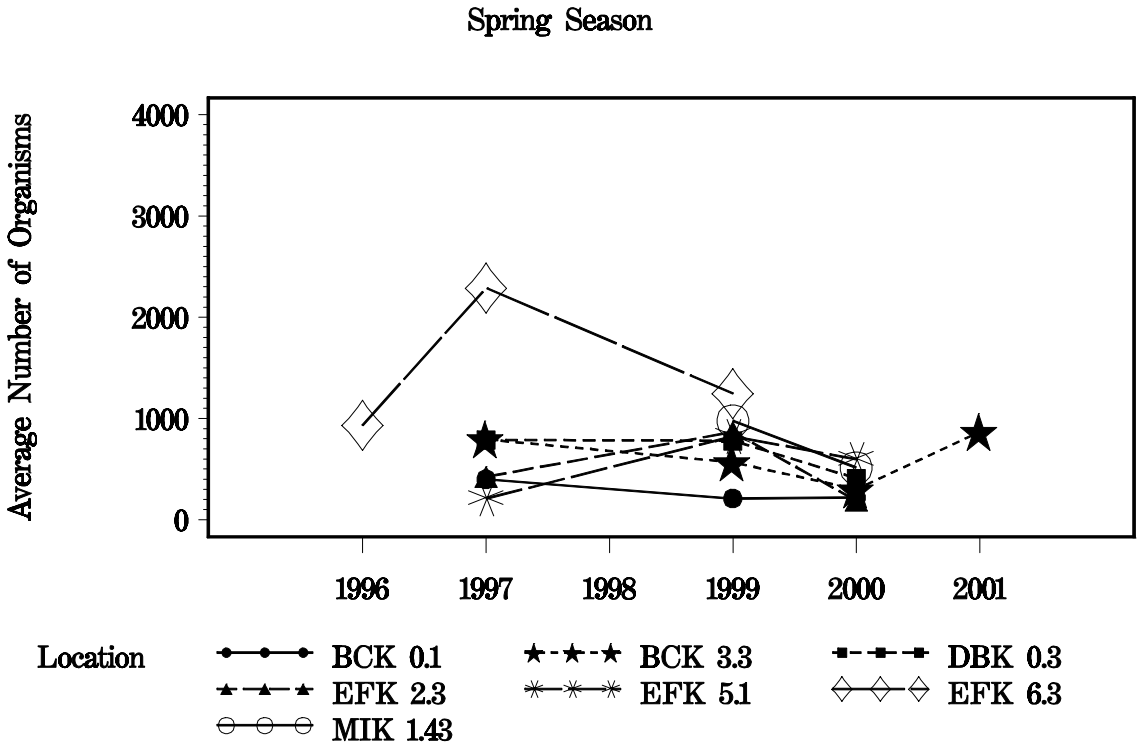

Figure 2. Average number of benthic organisms per sample for the Spring sampling events 1996-2001.

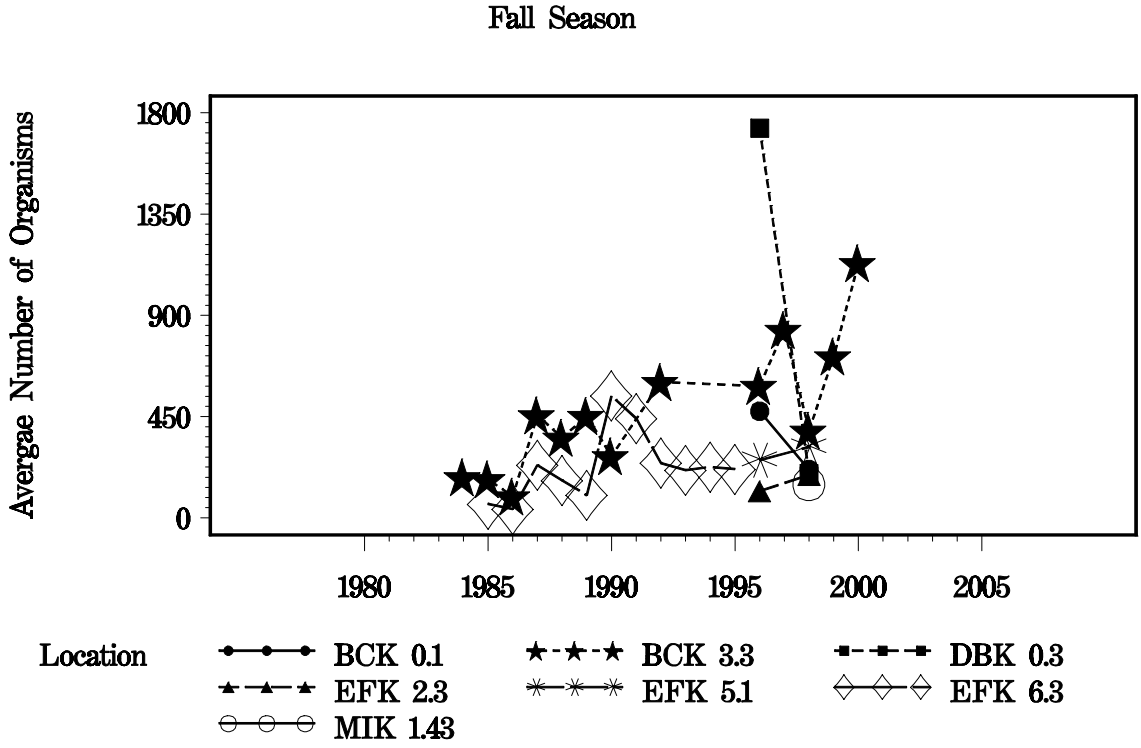

Figure 3. Average number of benthic organisms per sample for the Fall sampling events 1984-2000.

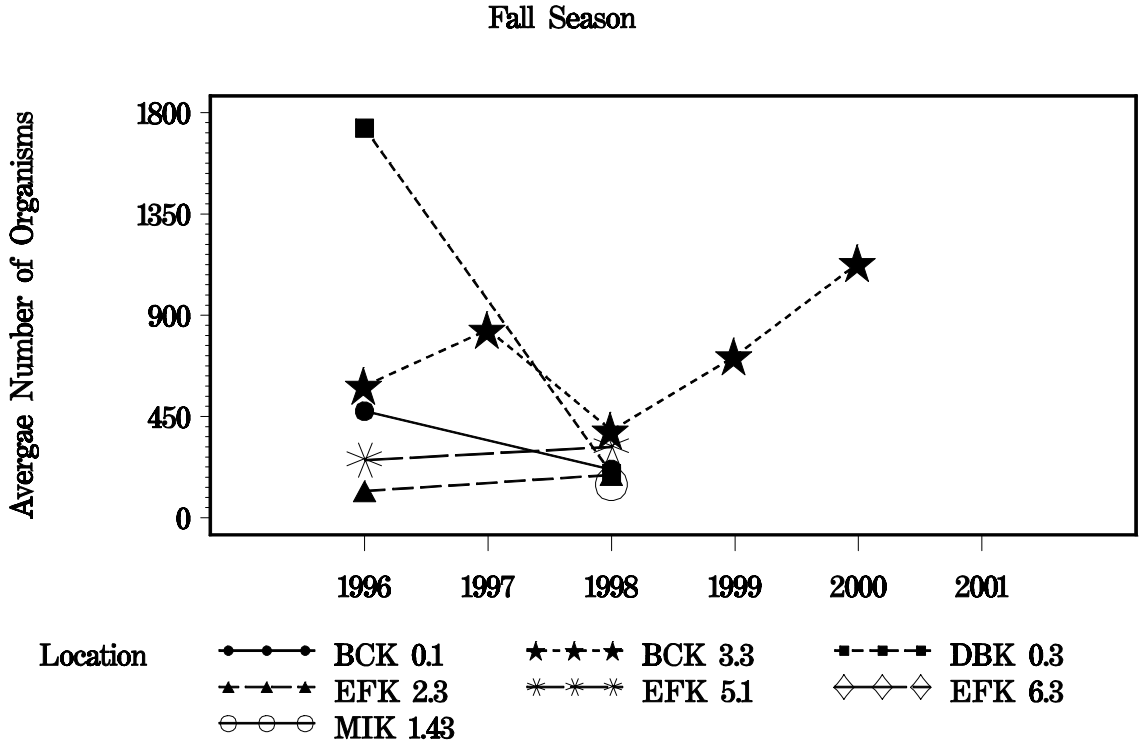

Figure 3. Average number of benthic organisms per sample for the Fall sampling events 1996-2000.

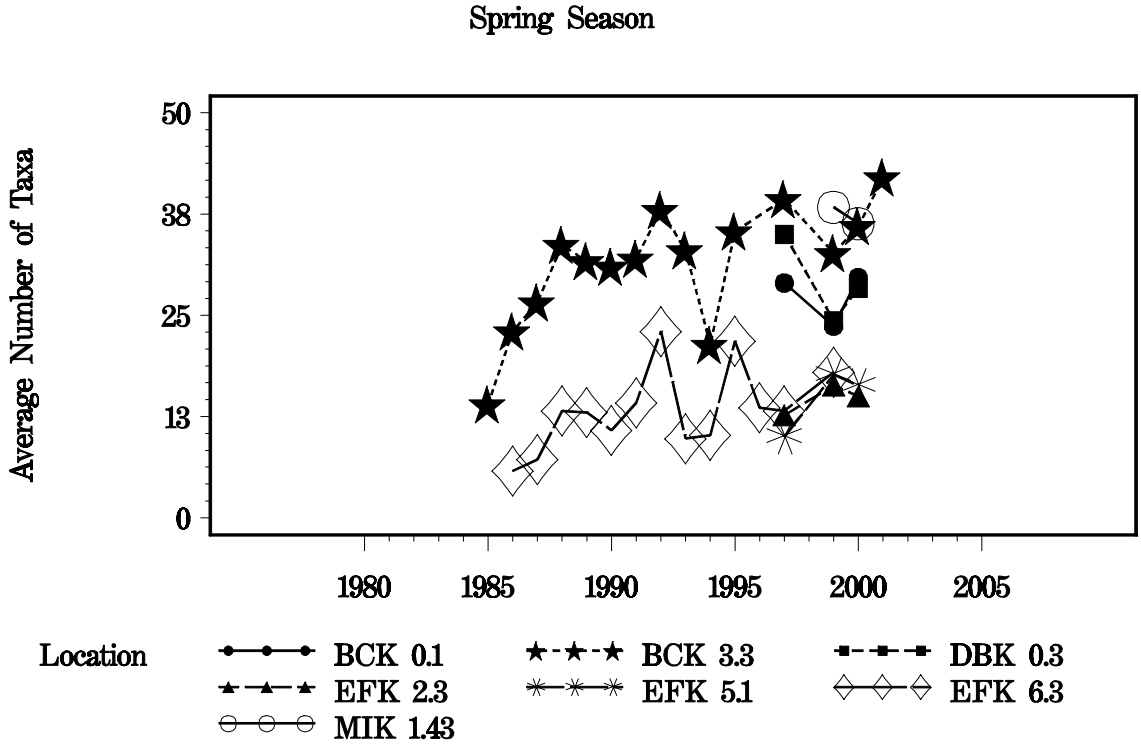

Figure 5. Average number of benthic taxa per sample for the Spring sampling events 1985-2001.

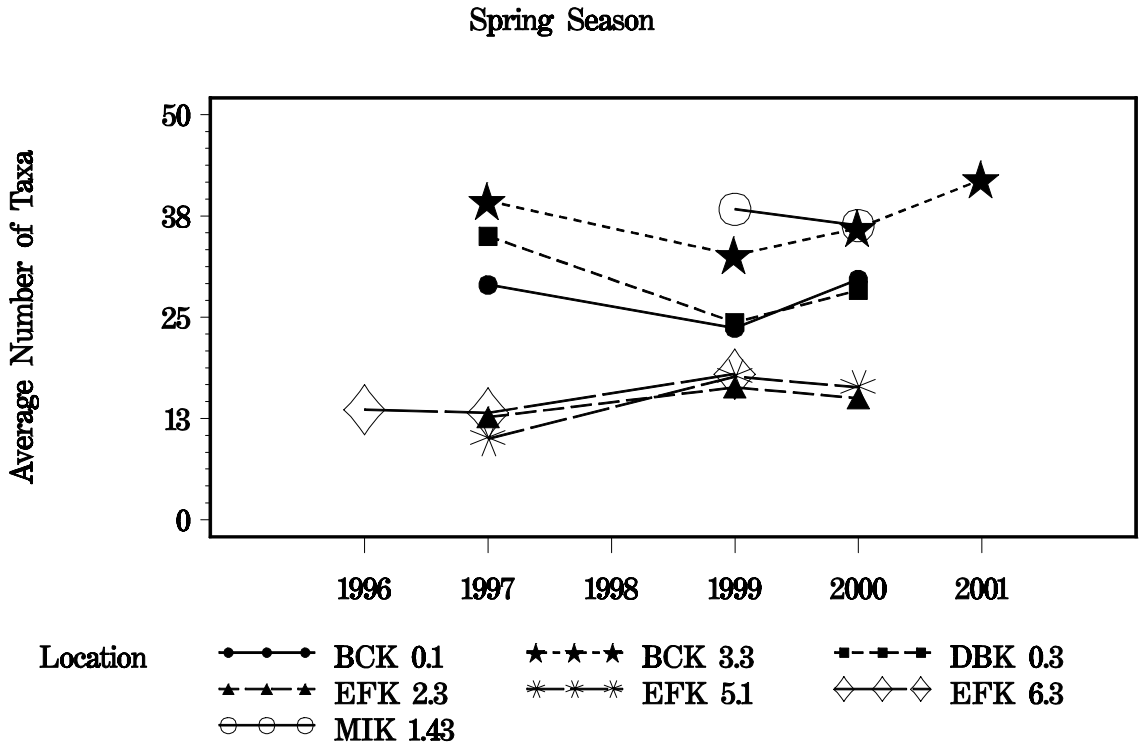

Figure 6. Average number of benthic taxa per sample for the Spring sampling events 1996-2001.

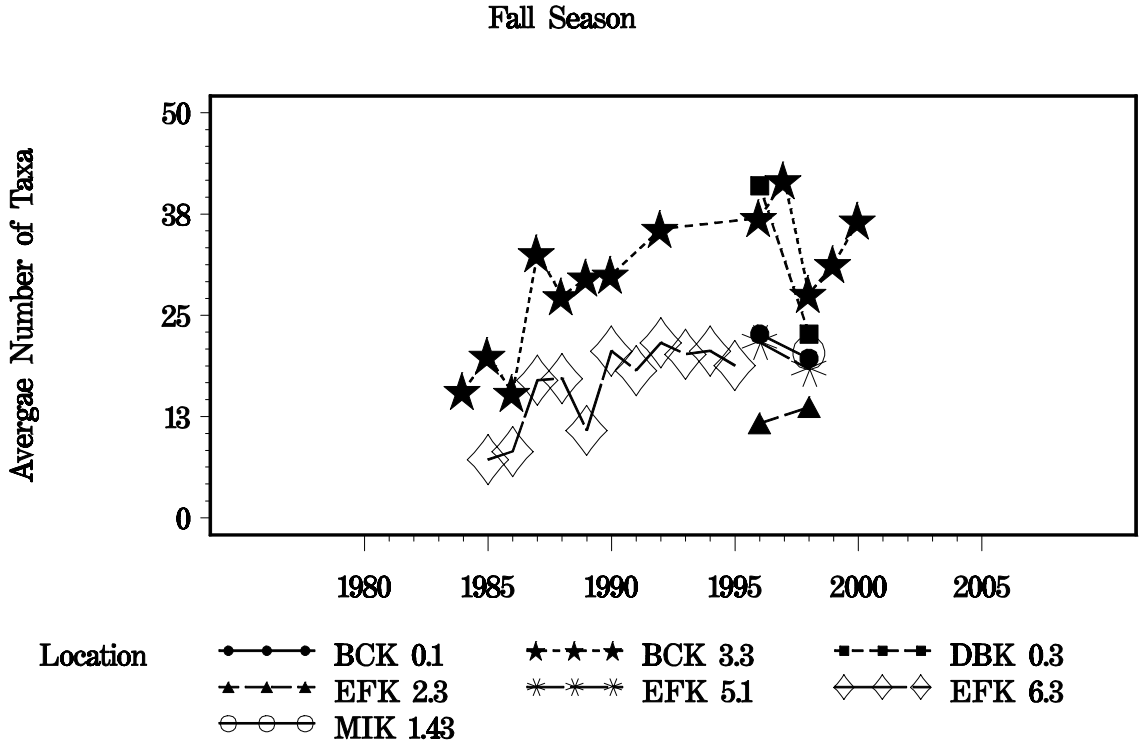

Figure 7. Average number of benthic taxa per sample for the Fall sampling events 1984- 2000.

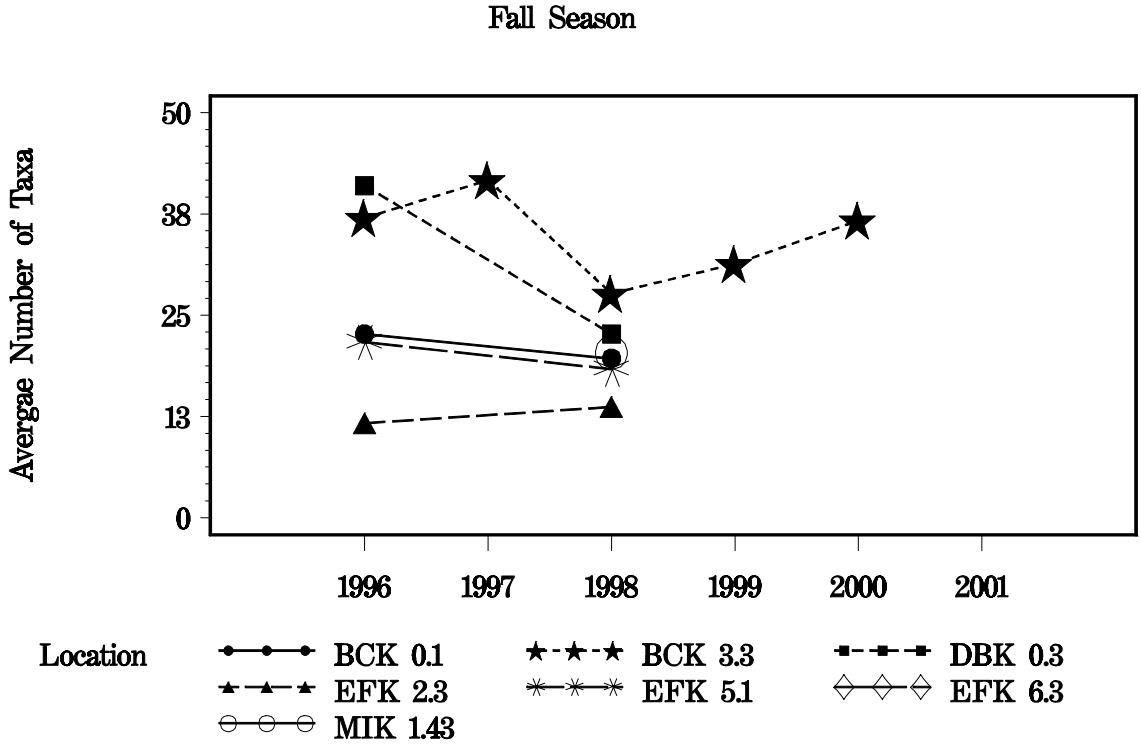

Figure 8. Average number of benthic taxa per sample for the Fall sampling events 1996- 2000.

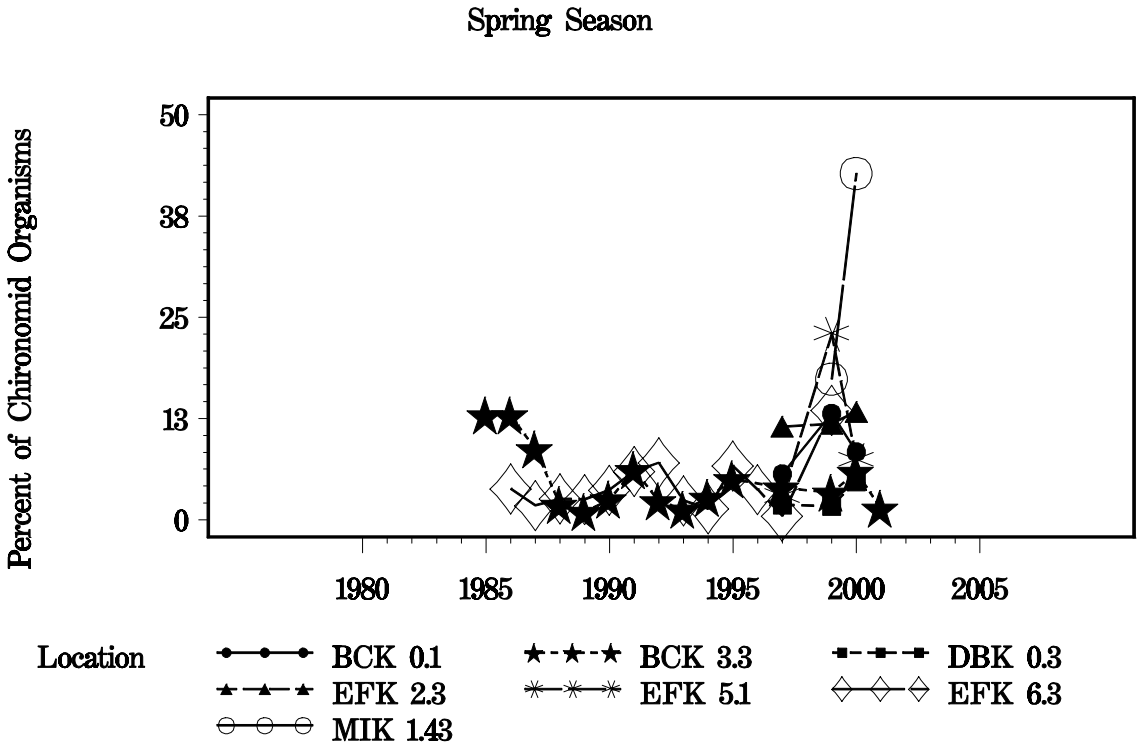

Figure 9. Percent chironomid organisms per sample for the Spring sampling events 1985- 2001.

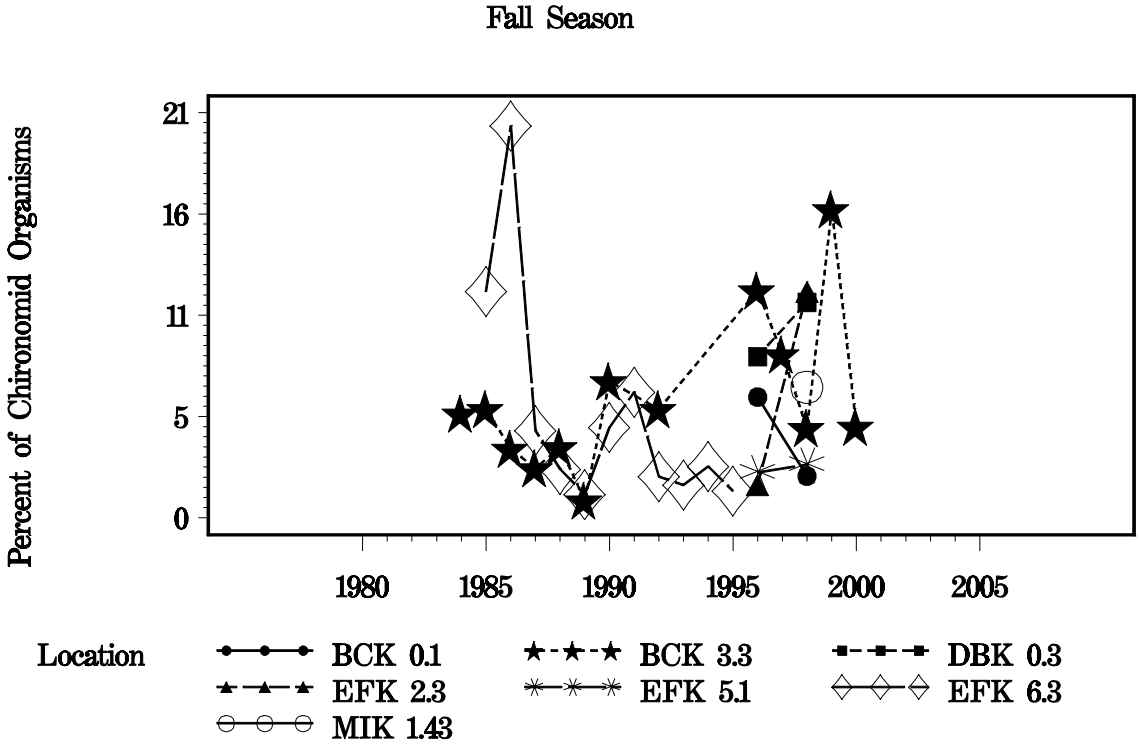

Figure 10. Percent chironomid organisms per sample for the Fall sampling events 1984- 2000.

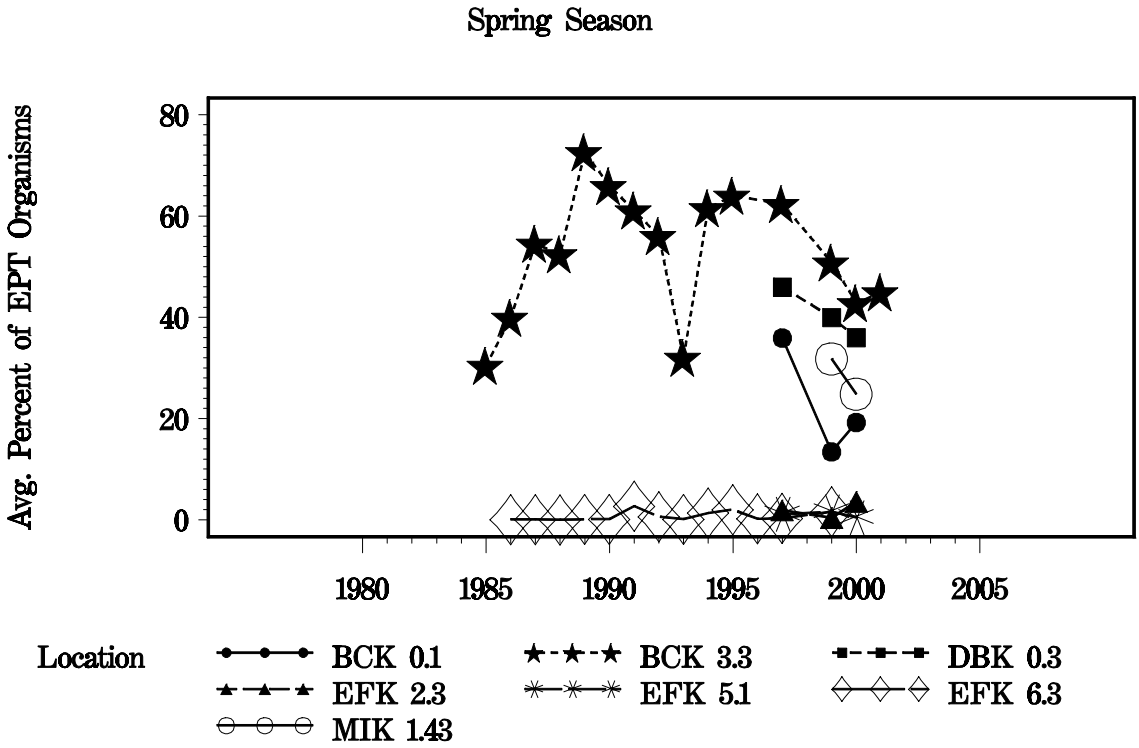

Figure 11. Percent EPT organisms per sample for the Spring sampling events 1985- 2001.

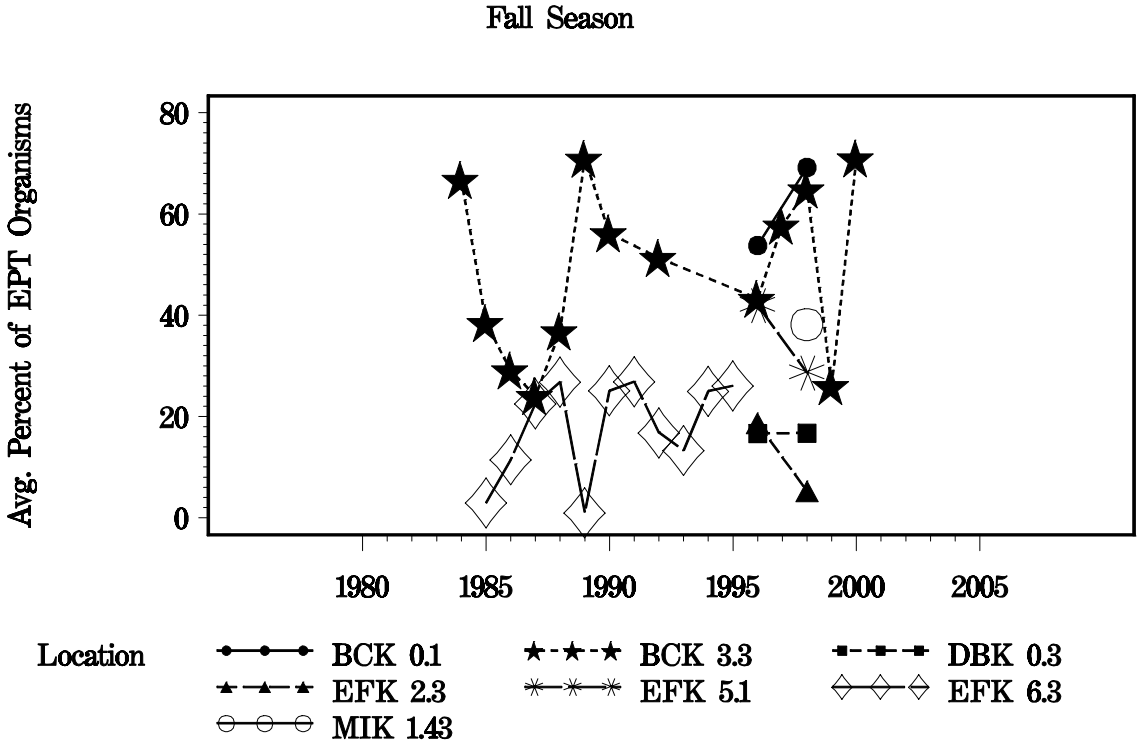

Figure 12. Percent EPT organisms per sample for the Fall sampling events 1984- 2000.

Table 1. ED-1 Benthic Data Summarized by Event

Location	Year	Season	Average Number of Organisms per Sample	Average Number of Taxa per Sample	Average Percent of EPT Organisms	Average Percent of Chironomid Organisms
BCK 0.1	1997	Spring	400	29	36	6
BCK 0.1	1999	Spring	210	24	13	13
BCK 0.1	2000	Spring	222	30	19	8
BCK 0.1	1996	Fall	474	23	54	6
BCK 0.1	1998	Fall	215	20	69	2
BCK 3.3	1985	Spring	72	14	30	13
BCK 3.3	1986	Spring	167	23	40	13
BCK 3.3	1987	Spring	278	27	54	9
BCK 3.3	1988	Spring	329	34	52	2
BCK 3.3	1989	Spring	553	32	73	1
BCK 3.3	1990	Spring	358	31	66	3
BCK 3.3	1991	Spring	456	32	61	6
BCK 3.3	1992	Spring	1221	38	56	2
BCK 3.3	1993	Spring	401	33	32	1
BCK 3.3	1994	Spring	124	21	62	3
BCK 3.3	1995	Spring	493	35	64	5
BCK 3.3	1997	Spring	793	39	62	4
BCK 3.3	1999	Spring	567	33	51	3
BCK 3.3	2000	Spring	300	36	43	6
BCK 3.3	2001	Spring	868	42	45	1
BCK 3.3	1984	Fall	179	16	67	5
BCK 3.3	1985	Fall	171	20	38	6
BCK 3.3	1986	Fall	95	15	29	4
BCK 3.3	1987	Fall	456	33	24	3
BCK 3.3	1988	Fall	355	27	37	4
BCK 3.3	1989	Fall	453	30	71	1
BCK 3.3	1990	Fall	274	30	56	7
BCK 3.3	1992	Fall	604	36	51	6
BCK 3.3	1996	Fall	586	37	43	12
BCK 3.3	1997	Fall	835	42	58	8
BCK 3.3	1998	Fall	388	28	65	5
BCK 3.3	1999	Fall	717	31	26	16
BCK 3.3	2000	Fall	1132	37	71	5
DBK 0.3	1997	Spring	788	35	46	2
DBK 0.3	1999	Spring	781	24	40	2
DBK 0.3	2000	Spring	407	28	36	5
DBK 0.3	1996	Fall	1731	41	17	8
DBK 0.3	1998	Fall	197	23	17	11
EFK 2.3	1997	Spring	423	13	2	11
EFK 2.3	1999	Spring	867	16	0	12
EFK 2.3	2000	Spring	187	15	4	13
EFK 2.3	1996	Fall	118	12	19	2
EFK 2.3	1998	Fall	191	14	5	12
EFK 5.1	1997	Spring	208	10	1	3
EFK 5.1	1999	Spring	824	18	2	23
EFK 5.1	2000	Spring	597	16	0	7
EFK 5.1	1996	Fall	256	22	42	2
EFK 5.1	1998	Fall	315	18	29	3

Table 1. ED-1 Benthic Data Summarized by Event (continued)

Location	Year	Season	Average Number of Organisms per Sample	Average Number of Taxa per Sample	Average Percent of EPT Organisms	Average Percent of Chironomid Organisms
EFK 6.3	1986	Spring	256	6	0	4
EFK 6.3	1987	Spring	720	7	0	2
EFK 6.3	1988	Spring	3694	13	0	3
EFK 6.3	1989	Spring	1655	13	0	3
EFK 6.3	1990	Spring	1857	11	0	4
EFK 6.3	1991	Spring	686	14	3	6
EFK 6.3	1992	Spring	1875	23	1	7
EFK 6.3	1993	Spring	599	10	0	2
EFK 6.3	1994	Spring	234	10	1	1
EFK 6.3	1995	Spring	2474	22	2	7
EFK 6.3	1996	Spring	933	14	0	4
EFK 6.3	1997	Spring	2289	13	0	0
EFK 6.3	1999	Spring	1247	18	2	14
EFK 6.3	1985	Fall	61	7	3	12
EFK 6.3	1986	Fall	38	8	11	20
EFK 6.3	1987	Fall	234	17	23	5
EFK 6.3	1988	Fall	166	17	27	3
EFK 6.3	1989	Fall	100	11	1	1
EFK 6.3	1990	Fall	542	21	25	5
EFK 6.3	1991	Fall	442	18	27	7
EFK 6.3	1992	Fall	244	22	17	2
EFK 6.3	1993	Fall	212	20	13	2
EFK 6.3	1994	Fall	226	21	25	3
EFK 6.3	1995	Fall	216	19	26	1
MIK 1.43	1999	Spring	976	38	32	17
MIK 1.43	2000	Spring	514	36	25	43
MIK 1.43	1998	Fall	148	20	38	7

Table 2. Benthic Data Summary Statistics for the Average Number of Organisms per Sample

Season	Location	Total number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for normality
Spring	BCK 0.1	3	277.44	106.30	38.313	400.00	210.333	0.79595
Spring	BCK 3.3	15	465.48	306.66	65.880	1221.33	72.333	0.92088
Spring	DBK 0.3	3	658.67	217.69	33.050	788.00	407.333	0.76444
Spring	EFK 2.3	3	492.67	345.26	70.080	867.33	187.333	0.96976
Spring	EFK 5.1	3	542.89	311.17	57.318	823.67	208.333	0.97760
Spring	EFK 6.3	13	1424.55	1009.23	70.845	3694.20	234.000	0.92712
Spring	MIK 1.43	2	745.00	327.15	43.913	976.33	513.667	1.00000
Fall	BCK 0.1	2	344.67	182.90	53.067	474.00	215.333	1.00000
Fall	BCK 3.3	13	480.34	293.87	61.180	1132.00	95.000	0.94900
Fall	DBK 0.3	2	964.00	1084.70	112.521	1731.00	197.000	1.00000
Fall	EFK 2.3	2	154.33	51.38	33.294	190.67	118.000	1.00000
Fall	EFK 5.1	2	285.33	41.48	14.539	314.67	256.000	1.00000
Fall	EFK 6.3	11	225.64	151.25	67.034	541.80	38.400	0.89008
Fall	MIK 1.43	1	147.67	.	.	147.67	147.667	.

Table 3. Benthic Data Summary Statistics for the Average Number of Taxa per Sample

Season	Location	Total number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for normality
Spring	BCK 0.1	3	27.4444	3.2886	11.9827	29.6667	23.6667	0.83219
Spring	BCK 3.3	15	31.3067	7.3822	23.5802	42.0000	14.0000	0.93319
Spring	DBK 0.3	3	29.2222	5.3886	18.4401	35.0000	24.3333	0.97959
Spring	EFK 2.3	3	14.6667	1.8559	12.6540	16.3333	12.6667	0.97581
Spring	EFK 5.1	3	14.6667	4.0961	27.9277	17.6667	10.0000	0.87583
Spring	EFK 6.3	13	13.3692	5.0904	38.0756	23.0000	5.8000	0.93492
Spring	MIK 1.43	2	37.3333	1.4142	3.7881	38.3333	36.3333	1.00000
Fall	BCK 0.1	2	21.1667	2.1213	10.0220	22.6667	19.6667	1.00000
Fall	BCK 3.3	13	29.2872	8.1405	27.7956	41.6667	15.4000	0.93373
Fall	DBK 0.3	2	31.8333	12.9636	40.7234	41.0000	22.6667	1.00000
Fall	EFK 2.3	2	12.6667	1.4142	11.1648	13.6667	11.6667	1.00000
Fall	EFK 5.1	2	20.0000	2.3570	11.7851	21.6667	18.3333	1.00000
Fall	EFK 6.3	11	16.4000	5.1962	31.6839	21.6000	7.2000	0.82890
Fall	MIK 1.43	1	20.3333	.	.	20.3333	20.3333	.

Table 4. Benthic Data Summary Regression Table for the Average Number of Organisms per Sample

Location	Season	Parameter Estimate	Standard Error	Pr > |t|	R-Square	LCL	UCL
BCK 0.1	Spring	-64.40476	26.35192	0.2472	0.8566	-399.24	270.43
BCK 0.1	Fall	-129.33333	.	.	1.0000	.	.
BCK 3.3	Spring	26.95972	14.76491	0.0909	0.2041	-4.9379	58.8574
BCK 3.3	Fall	42.23581	8.87341	0.0006	0.6732	22.7056	61.7661
DBK 0.3	Spring	-109.28571	91.46878	0.4436	0.5881	-1271.51	1052.94
DBK 0.3	Fall	-767.00000	.	.	1.0000	.	.
EFK 2.3	Spring	-35.71429	223.18712	0.8990	0.0250	-2871.58	2800.15
EFK 2.3	Fall	36.33333	.	.	1.0000	.	.
EFK 5.1	Spring	154.90476	132.29569	0.4500	0.5782	-1526.07	1835.88
EFK 5.1	Fall	29.33333	.	.	1.0000	.	.
EFK 6.3	Spring	8.65391	75.45602	0.9108	0.0012	-157.42	174.73
EFK 6.3	Fall	17.76364	14.00078	0.2364	0.1517	-13.9083	49.4356
MIK 1.43	Spring	-462.66667	.	.	1.0000	.	.
MIK 1.43	Fall	0	.	.	.	.	.

Table 5. Benthic Data Summary Regression Table for the Average Number of Taxa per Sample

Location	Season	Parameter Estimate	Standard Error	Pr > |t|	R-Square	LCL	UCL
BCK 0.1	Spring	-0.19048	2.14444	0.9436	0.0078	-27.4382	27.0573
BCK 0.1	Fall	-1.50000	.	.	1.0000	.	.
BCK 3.3	Spring	0.97688	0.29210	0.0053	0.4625	0.3458	1.6079
BCK 3.3	Fall	1.02802	0.29796	0.0054	0.5197	0.3722	1.6838
DBK 0.3	Spring	-2.66667	2.30940	0.4544	0.5714	-32.0104	26.6771
DBK 0.3	Fall	-9.16667	.	.	1.0000	.	.
EFK 2.3	Spring	0.92857	0.78355	0.4462	0.5841	-9.0273	10.8845
EFK 2.3	Fall	1.00000	.	.	1.0000	.	.
EFK 5.1	Spring	2.35714	1.27842	0.3164	0.7727	-13.8867	18.6010
EFK 5.1	Fall	-1.66667	.	.	1.0000	.	.
EFK 6.3	Spring	0.66811	0.32317	0.0631	0.2798	-0.04319	1.3794
EFK 6.3	Fall	1.21273	0.33063	0.0052	0.5992	0.4648	1.9607
MIK 1.43	Spring	-2.00000	.	.	1.0000	.	.
MIK 1.43	Fall	0	.	.	.	.	.

Table 6. Benthic Data Summary Statistics for the Average Percent of Chironomid Organisms

Season	Location	Total number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for normality
Spring	BCK 0.1	3	9.0763	3.7879	41.735	13.1537	5.6667	0.97669
Spring	BCK 3.3	15	4.7837	3.9307	82.169	12.9032	0.9639	0.83039
Spring	DBK 0.3	3	2.7718	1.7117	61.752	4.7463	1.7079	0.78774
Spring	EFK 2.3	3	12.2389	0.9767	7.980	13.3452	11.4961	0.89615
Spring	EFK 5.1	3	11.0347	10.5174	95.312	22.9057	2.8800	0.90636
Spring	EFK 6.3	13	4.2764	3.4305	80.219	13.5204	0.4806	0.83776
Spring	MIK 1.43	2	30.0712	17.9510	59.695	42.7644	17.3779	1.00000
Fall	BCK 0.1	2	4.2130	2.8932	68.673	6.2588	2.1672	1.00000
Fall	BCK 3.3	13	6.1514	4.0159	65.285	15.9851	0.8837	0.88337
Fall	DBK 0.3	2	9.7625	1.9870	20.354	11.1675	8.3574	1.00000
Fall	EFK 2.3	2	6.7041	7.0841	105.668	11.7133	1.6949	1.00000
Fall	EFK 5.1	2	2.5490	0.2903	11.387	2.7542	2.3438	1.00000
Fall	EFK 6.3	11	5.3973	5.8209	107.850	20.3125	1.2000	0.72987
Fall	MIK 1.43	1	6.7720	.	.	6.7720	6.7720	.

Table 7. Benthic Data Summary Statistics for the Average Percent of EPT Organisms

Season	Location	Total number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for normality
Spring	BCK 0.1	3	22.8689	11.6596	50.984	35.9167	13.4707	0.92652
Spring	BCK 3.3	15	52.7560	12.5501	23.789	72.5904	30.4147	0.95675
Spring	DBK 0.3	3	40.6513	5.0226	12.355	45.9814	36.0065	0.98603
Spring	EFK 2.3	3	1.9443	1.5879	81.671	3.5587	0.3843	0.99912
Spring	EFK 5.1	3	1.0484	0.5691	54.280	1.5783	0.4469	0.98813
Spring	EFK 6.3	13	0.7226	0.8989	124.411	2.7098	0.0054	0.77481
Spring	MIK 1.43	2	28.3198	4.9014	17.307	31.7856	24.8540	1.00000
Fall	BCK 0.1	2	61.4963	10.8877	17.705	69.1950	53.7975	1.00000
Fall	BCK 3.3	13	48.9288	17.0872	34.922	70.9364	24.0497	0.91957
Fall	DBK 0.3	2	16.7042	0.0666	0.399	16.7513	16.6570	1.00000
Fall	EFK 2.3	2	11.9444	9.4747	79.324	18.6441	5.2448	1.00000
Fall	EFK 5.1	2	35.2644	9.4225	26.720	41.9271	28.6017	1.00000
Fall	EFK 6.3	11	17.9908	9.6111	53.422	26.8778	1.0000	0.84680
Fall	MIK 1.43	1	38.1490	.	.	38.1490	38.1490	.

Table 8. Benthic Data Summary Regression Table for the Average Percent of Chironomid Organisms

Location	Season	Parameter Estimate	Standard Error	Pr > |t|	R-Square	LCL	UCL
BCK 0.1	Spring	-6.37398	4.19936	0.3709	0.6973	-59.7320	46.9840
BCK 0.1	Fall	7.69879	.	.	1.0000	.	.
BCK 3.3	Spring	0.12716	0.67640	0.8538	0.0027	-1.3341	1.5884
BCK 3.3	Fall	0.70347	0.87719	0.4396	0.0552	-1.2272	2.6342
DBK 0.3	Spring	-3.27964	0.23544	0.0456	0.9949	-6.2712	-0.2881
DBK 0.3	Fall	0.04712	.	.	1.0000	.	.
EFK 2.3	Spring	0.36931	0.97171	0.7688	0.1262	-11.9774	12.7161
EFK 2.3	Fall	-6.69966	.	.	1.0000	.	.
EFK 5.1	Spring	-0.15957	0.33665	0.7182	0.1835	-4.4371	4.1179
EFK 5.1	Fall	-6.66269	.	.	1.0000	.	.
EFK 6.3	Spring	0.09007	0.06152	0.1712	0.1631	-0.04534	0.2255
EFK 6.3	Fall	1.34546	0.85552	0.1502	0.2156	-0.5899	3.2808
MIK 1.43	Spring	-6.93160	.	.	1.0000	.	.
MIK 1.43	Fall	0	.	.	.	.	.

Table 9. Benthic Data Summary Statistics for the Average Percent of EPT Organisms

Location	Season	Parameter Estimate	Standard Error	Pr > |t|	R-Square	LCL	UCL
BCK 0.1	Spring	1.31814	2.10044	0.6432	0.2826	-25.3705	28.0068
BCK 0.1	Fall	-2.04580	.	.	1.0000	.	.
BCK 3.3	Spring	-0.38333	0.18358	0.0570	0.2512	-0.7799	0.01327
BCK 3.3	Fall	0.38223	0.17806	0.0550	0.2952	-0.00969	0.7741
DBK 0.3	Spring	0.81335	0.77077	0.4829	0.5269	-8.9802	10.6069
DBK 0.3	Fall	1.40505	.	.	1.0000	.	.
EFK 2.3	Spring	0.55542	0.31672	0.3299	0.7546	-3.4689	4.5797
EFK 2.3	Fall	5.00919	.	.	1.0000	.	.
EFK 5.1	Spring	2.69853	6.33439	0.7436	0.1536	-77.7875	83.1846
EFK 5.1	Fall	0.20524	.	.	1.0000	.	.
EFK 6.3	Spring	0.35784	0.23285	0.1526	0.1767	-0.1547	0.8704
EFK 6.3	Fall	-1.14784	0.44256	0.0290	0.4277	-2.1490	-0.1467
MIK 1.43	Spring	25.38649	.	.	1.0000	.	.
MIK 1.43	Fall	0	.	.	.	.	.

Fish Monitoring Data

Data Sources

Data were obtained from three sources: OREIS, Lockwood Green Technologies, and hand entry from the ED-1 MAP reports. OREIS data were received as a tab-delimited ASCII file queried from the OREIS database. The OREIS data included the population surveys of fish at EFK 6.3 from 1985 through 1997 and at BCK3.3 from 1988 through 2001. Lockwood Green data were received as Excel spreadsheets. These data included fish surveys from 1998 to 2000. Data were hand entered into Excel spreadsheets from the 1997 MAP reports.

Data Processing

SAS data analysis software was used to summarize and graph the data. The actual surface area of the stream sample was different for different sampling locations and sampling events. All of the fish population data were, therefore, reported as fish density (fish/m^2). The fish density and number of species captured were calculated for each location and sampling event (Table 1). The species were classified as piscivores or generalist feeders and as tolerant or intolerant species. The percentage of the total fish density comprising each of the three classifications (piscivore, generalist, tolerant) was calculated (Table 1). Note that tolerant species could include piscivores and generalist feeders. The data for each location and season were plotted by year to allow for a visual examination of temporal trends in the data (Figures 1 to 10).

Summary statistics were calculated for the fish density and number of species for each season and location (Tables 2 and 4). The summary statistics include the total number of samples, mean, standard deviation, coefficient of variation, maximum, minimum, and the probability for normality test. The coefficient of variation (CV) is the standard deviation divided by the mean and taken as a percent. The CV is a measure of the variability of the measurement. The probability for normality test is the probability for the Shapio-Wilk test for determining if the data are different from a normal distribution. Data with probability values less than 0.05 would be considered significantly different from normal.

A simple linear regression analysis was performed for the fish density and number of species versus year to look for a simple linear increase or decrease in the ecological measurements over time. The regression tables contain the parameter estimates for the slope, standard error, probability, R-square, and 95% lower (LCL) and upper (UCL) confidence limits on the slope. Probability values less than the alpha level chosen indicate a statistically significant slope and, therefore, a statistically significant trend. The R-square value indicates how well the linear regression fits the measurements. R-square values close to 1.0 indicate a very good fit. R-square values close to zero indicate a poor fit (Tables 3 and 5).

Plots (Figures 5 to 10), summary statistics (Tables 6, 8 and 9), and regression analyses (Tables 7, 9 and 11) were also computed for the percent generalist feeders, percent piscivores, and percent tolerant fish

References

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Proprietary Software Release 8.2 (TS2M0)

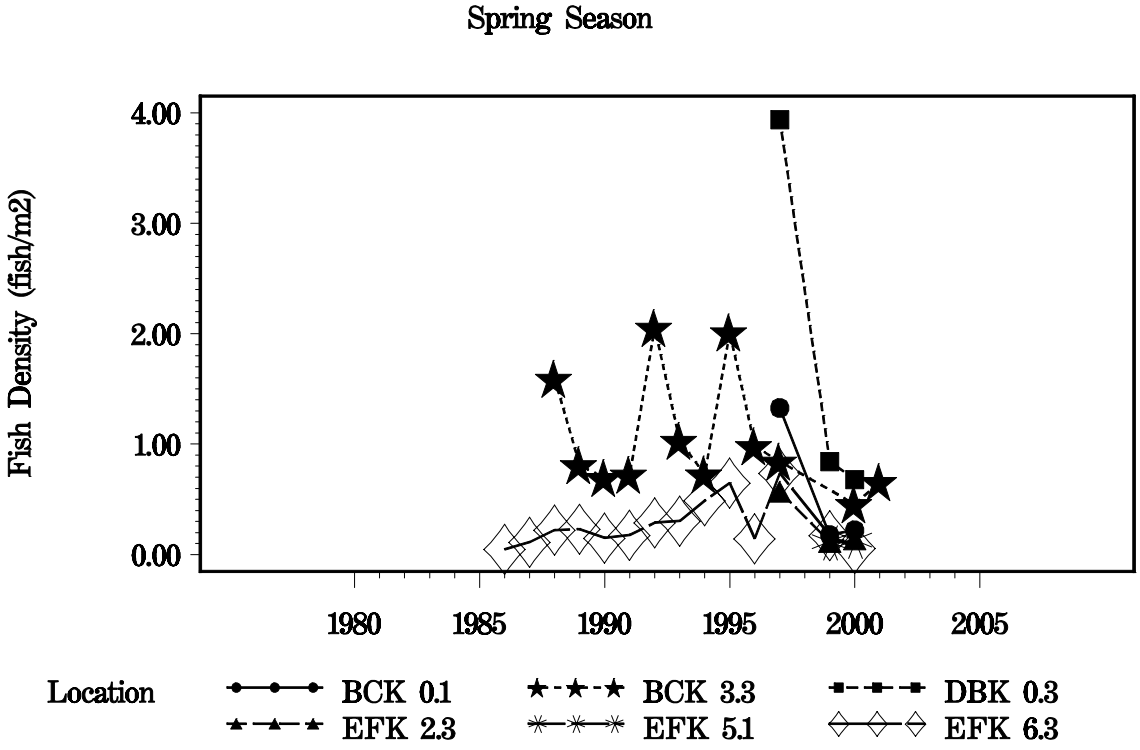

Figure 1. Fish density for the Spring sampling events.

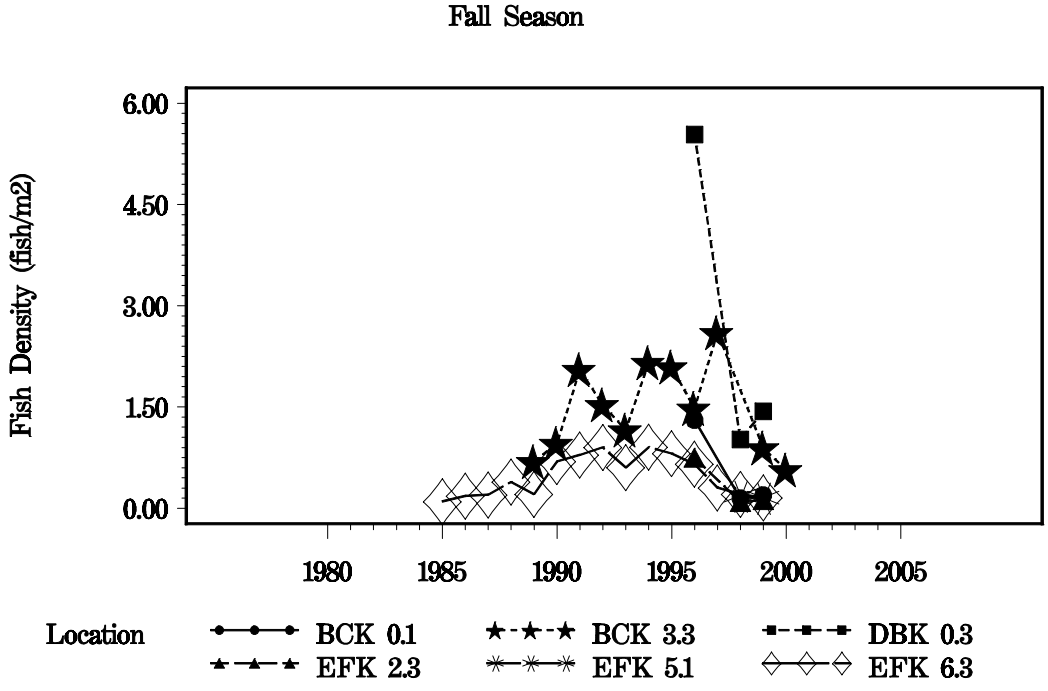

Figure 2. Fish density for the Fall sampling events.

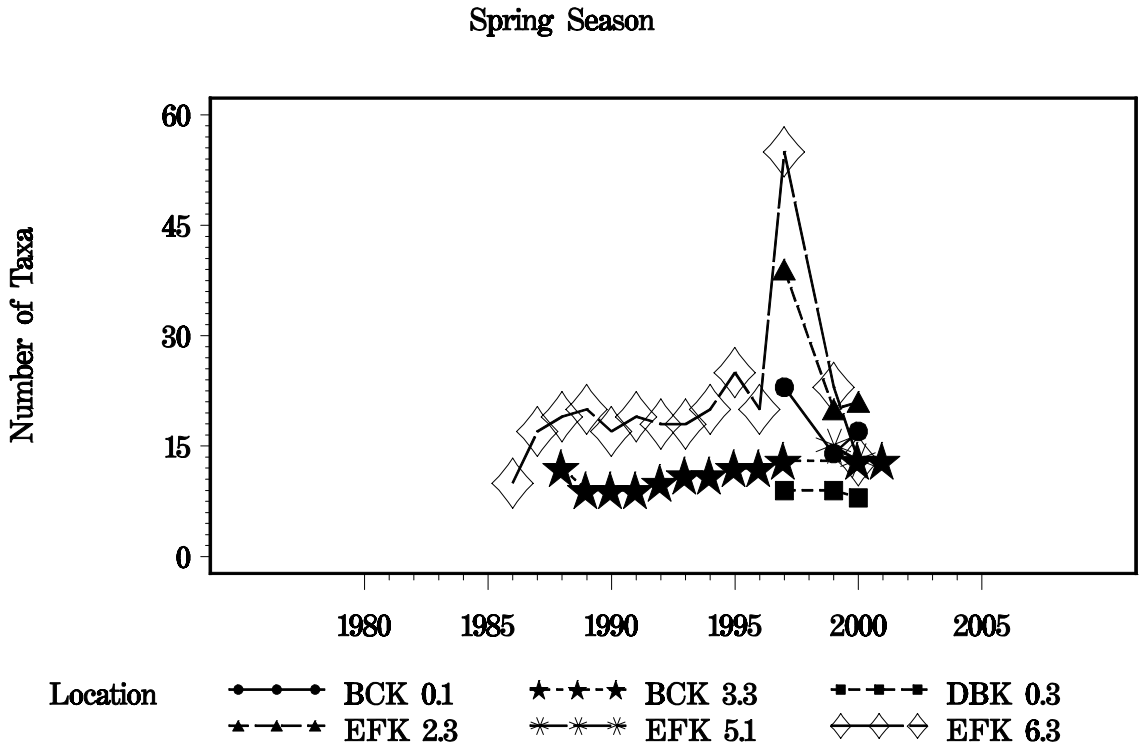

Figure 3. Number of taxa for the Spring sampling events.

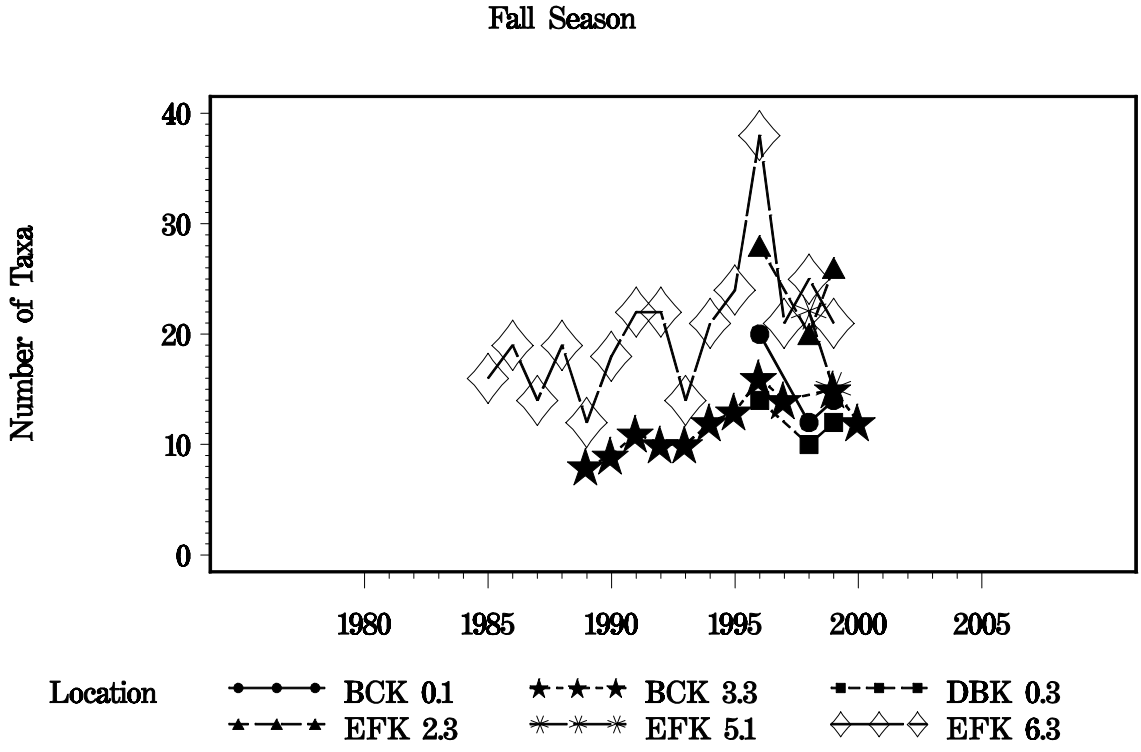

Figure 4. Number of taxa for the Fall sampling events.

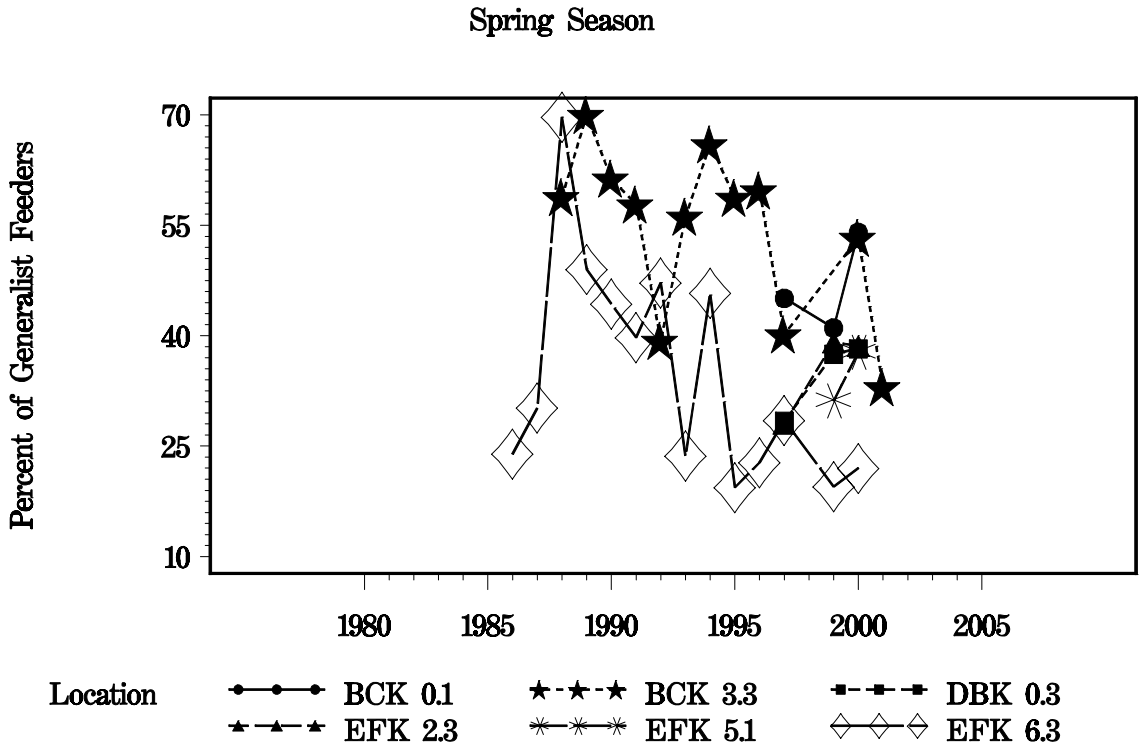

Figure 5. Percent generalist feeders for the Spring sampling events.

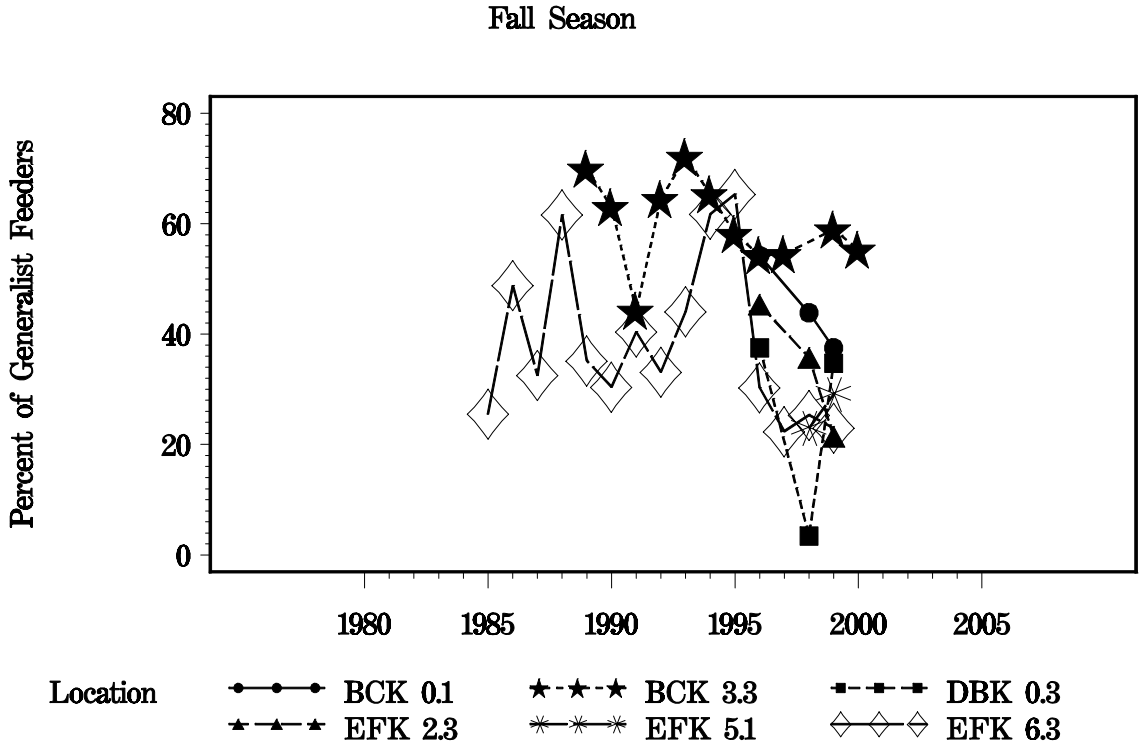

Figure 6. Percent generalist feeders for the Fall sampling events.

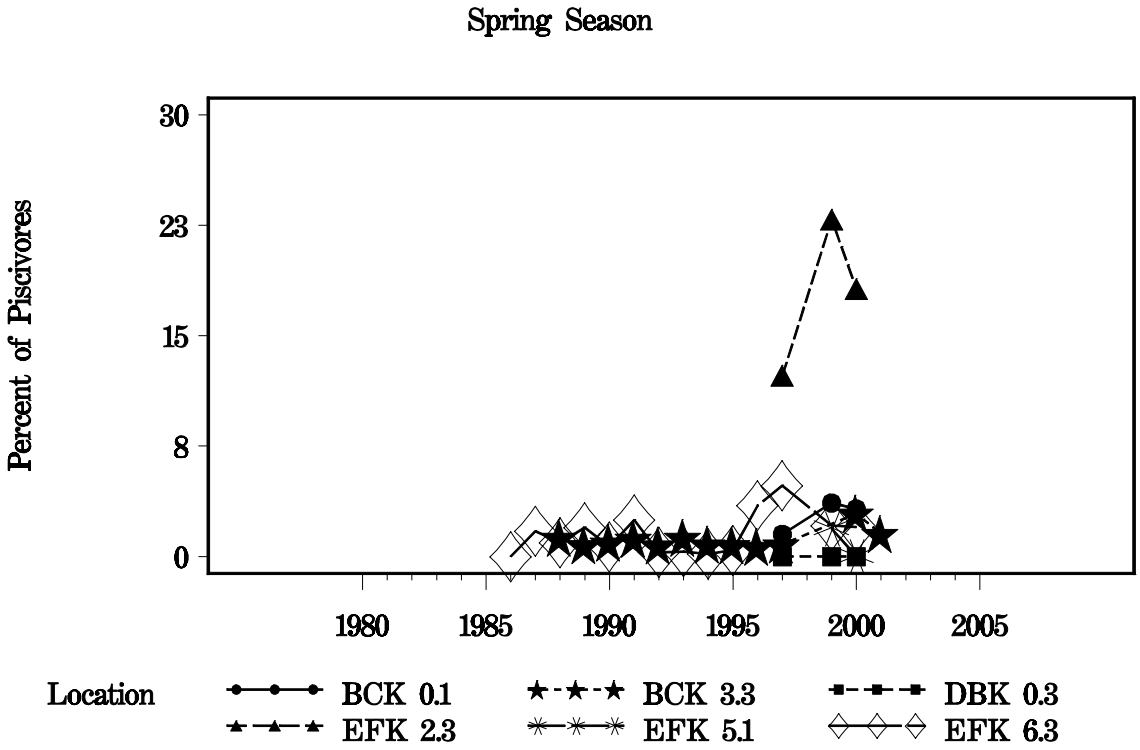

Figure 7. Percent piscivores for the Spring sampling events.

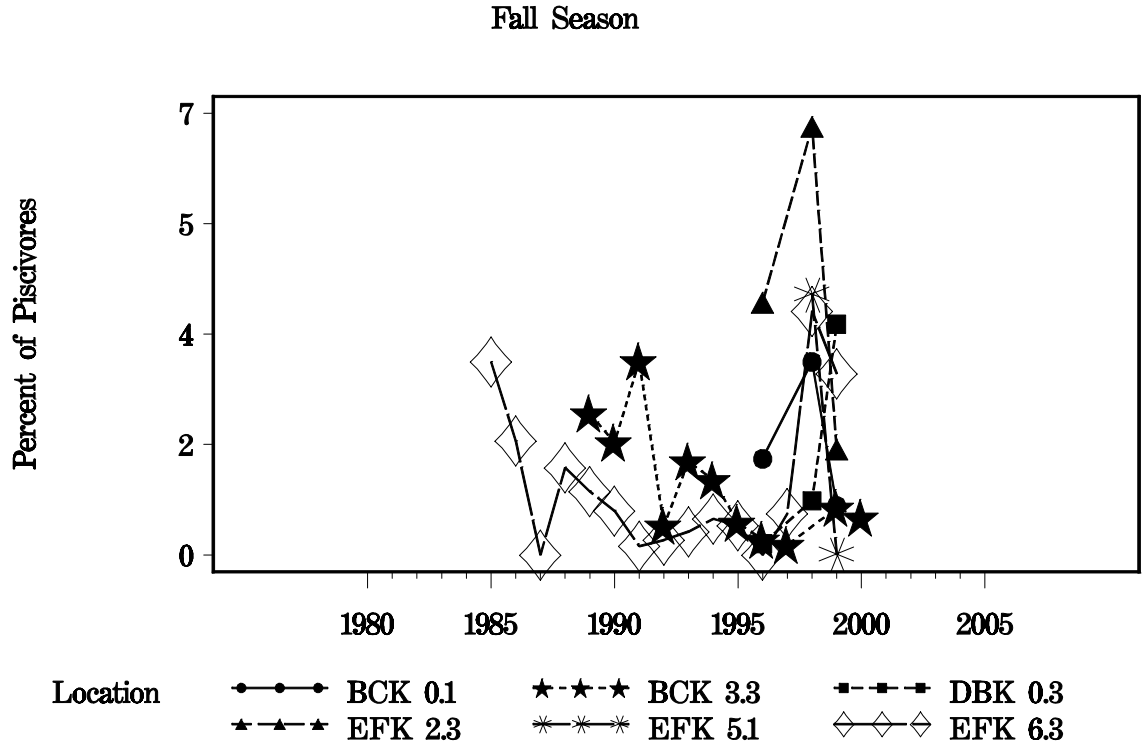

Figure 8. Percent piscivores for the Fall sampling events.

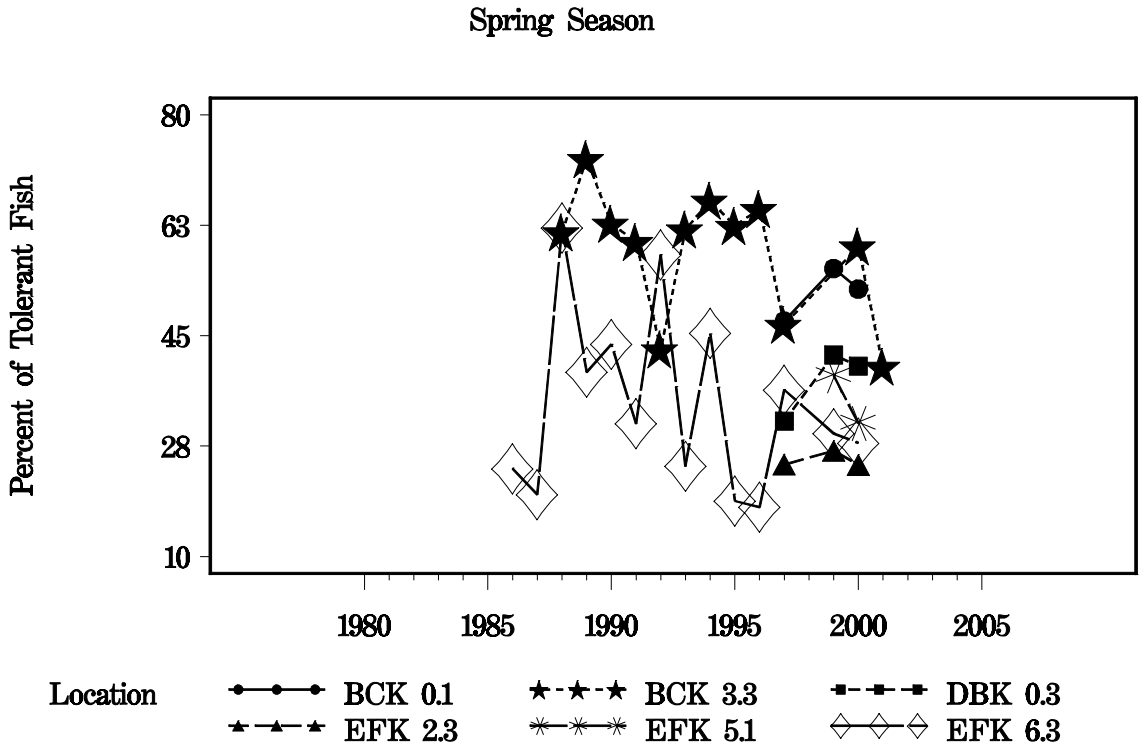

Figure 9. Percent tolerant fish for the Spring sampling events.

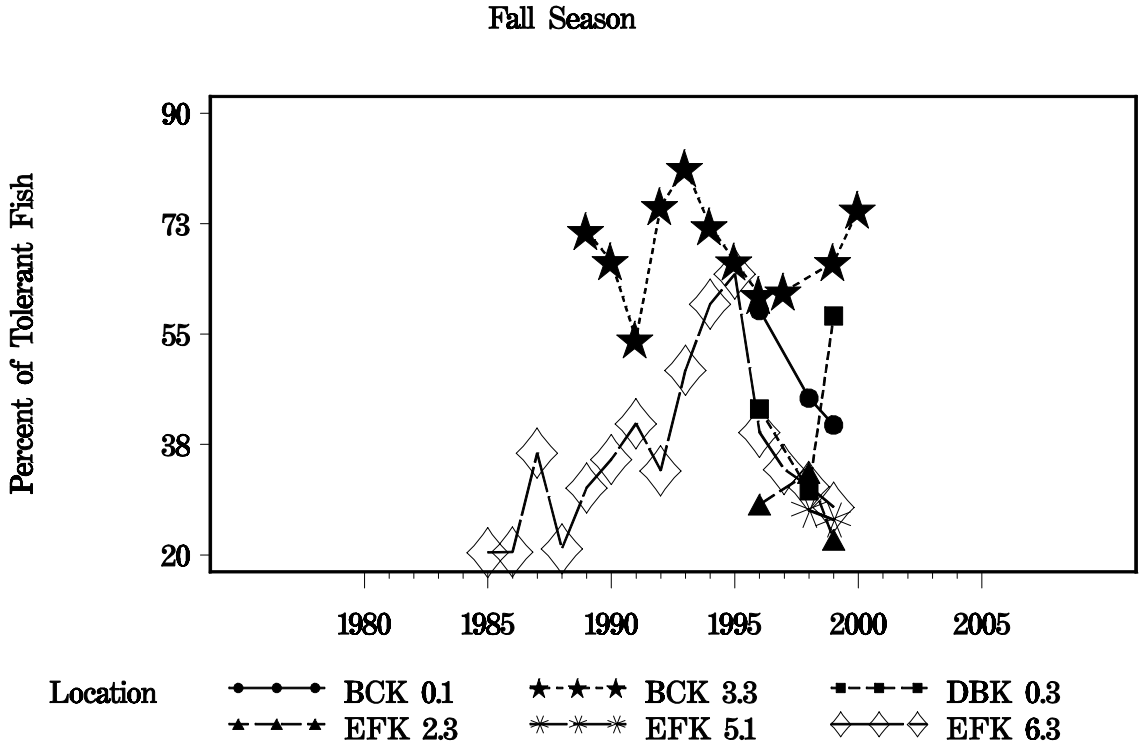

Figure 10. Percent tolerant fish for the Fall sampling events.

Table 1. Fish Data from ED-1 Locations Summarized by Sampling Event

Location	Year	Season	Fish Density (fish/m2)	Number of Taxa	Percent Generalist Feeders	Percent Piscivores	Percent Tolerant Fish
BCK 0.1	1996	Fall	1.31	20	54	2	59
BCK 0.1	1997	Spring	1.33	23	45	2	47
BCK 0.1	1998	Fall	0.15	12	44	3	45
BCK 0.1	1999	Spring	0.18	14	41	4	56
BCK 0.1	1999	Fall	0.20	14	38	1	41
BCK 0.1	2000	Spring	0.22	17	54	3	52
BCK 3.3	1988	Spring	1.59	12	59	1	61
BCK 3.3	1989	Spring	0.81	9	70	1	73
BCK 3.3	1989	Fall	0.69	8	70	2	71
BCK 3.3	1990	Spring	0.69	9	61	1	63
BCK 3.3	1990	Fall	0.96	9	63	2	67
BCK 3.3	1991	Spring	0.72	9	58	1	60
BCK 3.3	1991	Fall	2.05	11	44	3	54
BCK 3.3	1992	Spring	2.05	10	39	1	43
BCK 3.3	1992	Fall	1.53	10	64	0	75
BCK 3.3	1993	Spring	1.03	11	56	1	62
BCK 3.3	1993	Fall	1.16	10	72	1	81
BCK 3.3	1994	Spring	0.72	11	66	1	66
BCK 3.3	1994	Fall	2.16	12	65	1	72
BCK 3.3	1995	Spring	2.01	12	59	1	62
BCK 3.3	1995	Fall	2.09	13	58	1	66
BCK 3.3	1996	Spring	0.98	12	60	1	65
BCK 3.3	1996	Fall	1.48	16	54	0	61
BCK 3.3	1997	Spring	0.84	13	40	1	47
BCK 3.3	1997	Fall	2.60	14	54	0	62
BCK 3.3	1999	Fall	0.89	15	59	1	66
BCK 3.3	2000	Spring	0.46	13	53	3	59
BCK 3.3	2000	Fall	0.57	12	55	1	75
BCK 3.3	2001	Spring	0.66	13	33	2	40
DBK 0.3	1996	Fall	5.54	14	38	0	43
DBK 0.3	1997	Spring	3.94	9	28	0	31
DBK 0.3	1998	Fall	1.02	10	3	1	30
DBK 0.3	1999	Spring	0.84	9	38	0	42
DBK 0.3	1999	Fall	1.44	12	35	4	58
DBK 0.3	2000	Spring	0.68	8	38	0	40
EFK 2.3	1996	Fall	0.75	28	45	4	28
EFK 2.3	1997	Spring	0.57	39	28	12	25
EFK 2.3	1998	Fall	0.09	20	36	7	33
EFK 2.3	1999	Spring	0.11	20	39	23	27
EFK 2.3	1999	Fall	0.13	26	21	2	22
EFK 2.3	2000	Spring	0.14	21	39	18	25
EFK 5.1	1998	Fall	0.17	22	23	4	27
EFK 5.1	1999	Spring	0.11	15	31	2	39
EFK 5.1	1999	Fall	0.14	15	29	0	26
EFK 5.1	2000	Spring	0.12	13	38	0	31
EFK 6.3	1985	Fall	0.10	16	26	3	20
EFK 6.3	1986	Spring	0.05	10	24	0	24
EFK 6.3	1986	Fall	0.18	19	49	2	20
EFK 6.3	1987	Spring	0.11	17	30	2	20

Table 1. Fish Data from ED-1 Locations Summarized by Sampling Event (continued)

Location	Year	Season	Fish Density (fish/m2)	Number of Taxa	Percent Generalist Feeders	Percent Piscivores	Percent Tolerant Fish
EFK 6.3	1987	Fall	0.20	14	33	0	36
EFK 6.3	1988	Spring	0.22	19	70	1	62
EFK 6.3	1988	Fall	0.39	19	62	1	21
EFK 6.3	1989	Spring	0.23	20	49	2	39
EFK 6.3	1989	Fall	0.21	12	35	1	31
EFK 6.3	1990	Spring	0.15	17	44	1	44
EFK 6.3	1990	Fall	0.69	18	30	1	35
EFK 6.3	1991	Spring	0.18	19	40	2	31
EFK 6.3	1991	Fall	0.79	22	40	0	41
EFK 6.3	1992	Spring	0.29	18	47	0	58
EFK 6.3	1992	Fall	0.90	22	33	0	33
EFK 6.3	1993	Spring	0.30	18	24	0	24
EFK 6.3	1993	Fall	0.60	14	44	0	49
EFK 6.3	1994	Spring	0.49	20	46	0	45
EFK 6.3	1994	Fall	0.90	21	62	1	60
EFK 6.3	1995	Spring	0.65	25	19	0	19
EFK 6.3	1995	Fall	0.81	24	65	0	65
EFK 6.3	1996	Spring	0.15	20	23	3	18
EFK 6.3	1996	Fall	0.65	38	30	0	39
EFK 6.3	1997	Spring	0.74	55	29	5	36
EFK 6.3	1997	Fall	0.30	21	22	1	34
EFK 6.3	1998	Fall	0.21	25	25	4	31
EFK 6.3	1999	Spring	0.17	23	19	2	29
EFK 6.3	1999	Fall	0.16	21	23	3	28
EFK 6.3	2000	Spring	0.06	13	22	2	28

Table 2. Summary Statistics for Fish Density

Location	Season	Total Number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for Normality Test
BCK 0.1	Spring	3	0.57733	0.65219	112.967	1.33000	0.17937	0.77815
BCK 0.1	Fall	3	0.55150	0.65727	119.179	1.31000	0.14939	0.77950
BCK 3.3	Spring	12	1.04735	0.53754	51.324	2.05303	0.45667	0.81421
BCK 3.3	Fall	11	1.47093	0.67815	46.103	2.60246	0.56667	0.94060
DBK 0.3	Spring	3	1.82070	1.83715	100.904	3.94000	0.68000	0.78720
DBK 0.3	Fall	3	2.66538	2.49838	93.734	5.54000	1.01754	0.81917
EFK 2.3	Spring	3	0.27413	0.25653	93.579	0.57000	0.11369	0.79100
EFK 2.3	Fall	3	0.32259	0.37051	114.857	0.75000	0.09255	0.78716
EFK 5.1	Spring	2	0.11343	0.01051	9.267	0.12087	0.10600	1.00000
EFK 5.1	Fall	2	0.15550	0.02051	13.187	0.17000	0.14100	1.00000
EFK 6.3	Spring	14	0.27002	0.21143	78.302	0.73745	0.04742	0.84616
EFK 6.3	Fall	15	0.47349	0.29972	63.300	0.90486	0.09990	0.87135

Table 3. Regression Statistics for Fish Density

Location	Season	Total Number of Samples	Slope Estimate (Fish/m^2/y)	Standard Error	Pr > |t|	R^2	95% LCL on Slope	95% UCL on Slope
BCK 0.1	Spring	3	-0.39858	0.15306	0.2334	0.8715	-2.3433	1.5462
BCK 0.1	Fall	3	-0.40144	0.15490	0.2344	0.8704	-2.3697	1.5668
BCK 3.3	Spring	12	-0.04080	0.03885	0.3184	0.0993	-0.1274	0.04577
BCK 3.3	Fall	11	0.00093006	0.06278	0.9885	0.0000	-0.1411	0.1430
DBK 0.3	Spring	3	-1.15271	0.34315	0.1842	0.9186	-5.5129	3.2075
DBK 0.3	Fall	3	-1.49486	0.66369	0.2660	0.8353	-9.9279	6.9381
EFK 2.3	Spring	3	-0.15582	0.06265	0.2434	0.8609	-0.9518	0.6402
EFK 2.3	Fall	3	-0.22547	0.08942	0.2404	0.8641	-1.3617	0.9107
EFK 5.1	Spring	2	0.01487	.	.	1.0000	.	.
EFK 5.1	Fall	2	-0.02900	.	.	1.0000	.	.
EFK 6.3	Spring	14	0.01512	0.01312	0.2717	0.0996	-0.01347	0.04371
EFK 6.3	Fall	15	0.01490	0.01812	0.4258	0.0494	-0.02425	0.05405

Table 4. Summary Statistics for Number of Taxa

Season	Location	Total Number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for Normality
Spring	BCK 0.1	3	18.0000	4.5826	25.4588	23	14	0.96429
Fall	BCK 0.1	3	15.3333	4.1633	27.1522	20	12	0.92308
Spring	BCK 3.3	12	11.1667	1.5859	14.2023	13	9	0.86738
Fall	BCK 3.3	11	11.8182	2.5226	21.3453	16	8	0.97401
Spring	DBK 0.3	3	8.6667	0.5774	6.6617	9	8	0.75000
Fall	DBK 0.3	3	12.0000	2.0000	16.6667	14	10	1.00000
Spring	EFK 2.3	3	26.6667	10.6927	40.0975	39	20	0.78936
Fall	EFK 2.3	3	24.6667	4.1633	16.8784	28	20	0.92308
Spring	EFK 5.1	2	14.0000	1.4142	10.1015	15	13	1.00000
Fall	EFK 5.1	2	18.5000	4.9497	26.7554	22	15	1.00000
Spring	EFK 6.3	14	21.0000	10.4587	49.8034	55	10	0.63368
Fall	EFK 6.3	15	20.4000	6.1621	30.2064	38	12	0.86561

Table 5. Regression Statistics for Number of Taxa

Location	Season	Total Number of Samples	Slope Estimate (Taxa/y)	Standard Error	Pr > |t|	R^2	95% LCL on Slope	95% UCL on Slope
BCK 0.1	Spring	3	-2.35714	1.85577	0.4246	0.6173	-25.9369	21.2226
BCK 0.1	Fall	3	-2.28571	1.48461	0.3667	0.7033	-21.1495	16.5781
BCK 3.3	Spring	12	0.29174	0.07795	0.0038	0.5835	0.1181	0.4654
BCK 3.3	Fall	11	0.55049	0.14447	0.0042	0.6173	0.2237	0.8773
DBK 0.3	Spring	3	-0.28571	0.24744	0.4544	0.5714	-3.4297	2.8583
DBK 0.3	Fall	3	-0.85714	0.98974	0.5456	0.4286	-13.4330	11.7187
EFK 2.3	Spring	3	-6.50000	2.59808	0.2421	0.8622	-39.5117	26.5117
EFK 2.3	Fall	3	-1.14286	2.47436	0.7245	0.1758	-32.5826	30.2968
EFK 5.1	Spring	2	-2.00000	.	.	1.0000	.	.
EFK 5.1	Fall	2	-7.00000	.	.	1.0000	.	.
EFK 6.3	Spring	14	0.90832	0.63185	0.1761	0.1469	-0.4684	2.2850
EFK 6.3	Fall	15	0.77143	0.31665	0.0300	0.3134	0.08735	1.4555

Table 6. Summary Statistics for Percent of Generalist Feeders

Season	Location	Total Number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for Normality
Spring	BCK 0.1	3	46.7352	6.6363	14.1997	54.0323	41.0606	0.95517
Fall	BCK 0.1	3	45.1920	8.4265	18.6460	54.1985	37.5000	0.98175
Spring	BCK 3.3	12	54.5230	11.2650	20.6610	69.9620	32.9949	0.89643
Fall	BCK 3.3	11	60.0190	8.0065	13.3399	72.1068	44.2238	0.96740
Spring	DBK 0.3	3	34.7206	5.4633	15.7350	38.2353	28.4264	0.80588
Fall	DBK 0.3	3	25.2498	18.9321	74.9792	37.5451	3.4483	0.81090
Spring	EFK 2.3	3	35.2637	6.2338	17.6776	39.0845	28.0702	0.78046
Fall	EFK 2.3	3	34.1615	12.0428	35.2526	45.3333	21.4047	0.98701
Spring	EFK 5.1	2	34.4340	4.6696	13.5610	37.7358	31.1321	1.00000
Fall	EFK 5.1	2	26.0096	4.3394	16.6838	29.0780	22.9412	1.00000
Spring	EFK 6.3	14	34.6869	14.9115	42.9887	69.6682	19.3878	0.87511
Fall	EFK 6.3	15	38.6469	14.6026	37.7848	65.3442	22.3684	0.87881

Table 7. Regression Statistics for Percent of Generalist Feeders

Location	Season	Total Number of Samples	Slope Estimate (%/y)	Standard Error	Pr > |t|	R^2	95% LCL on Slope	95% UCL on Slope
BCK 0.1	Spring	3	2.25898	3.71096	0.6519	0.2704	-44.8933	49.4112
BCK 0.1	Fall	3	-5.50820	0.30115	0.0348	0.9970	-9.3347	-1.6817
BCK 3.3	Spring	12	-1.57010	0.69961	0.0487	0.3350	-3.1289	-0.01128
BCK 3.3	Fall	11	-0.76119	0.69646	0.3028	0.1172	-2.3367	0.8143
DBK 0.3	Spring	3	3.45066	0.94063	0.1694	0.9308	-8.5012	15.4025
DBK 0.3	Fall	3	-3.23235	11.96507	0.8320	0.0680	-155.26	148.80
EFK 2.3	Spring	3	3.80565	1.47356	0.2352	0.8696	-14.9177	22.5290
EFK 2.3	Fall	3	-7.52152	2.36266	0.1938	0.9102	-37.5419	22.4989
EFK 5.1	Spring	2	6.60377	.	.	1.0000	.	.
EFK 5.1	Fall	2	6.13684	.	.	1.0000	.	.
EFK 6.3	Spring	14	-1.74225	0.83567	0.0591	0.2659	-3.5630	0.07851
EFK 6.3	Fall	15	-0.63496	0.88833	0.4874	0.0378	-2.5541	1.2842

Table 8. Summary Statistics for Percent of Piscivores

Season	Location	Total Number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for Normality
Spring	BCK 0.1	3	2.7931	1.13658	40.692	3.6498	1.5038	0.89131
Fall	BCK 0.1	3	1.7897	1.16252	64.955	3.0612	0.7813	0.96161
Spring	BCK 3.3	12	1.1411	0.62270	54.570	2.9197	0.6711	0.70261
Fall	BCK 3.3	11	1.1328	0.92505	81.663	3.0686	0.1575	0.89891
Spring	DBK 0.3	3	0.0000	0.00000	.	0.0000	0.0000	.
Fall	DBK 0.3	3	1.5670	1.84307	117.615	3.6585	0.1805	0.89027
Spring	EFK 2.3	3	17.7833	5.31453	29.885	22.8873	12.2807	0.99578
Fall	EFK 2.3	3	4.1532	2.56098	61.663	6.7873	1.6722	0.99732
Spring	EFK 5.1	2	0.9434	1.33416	141.421	1.8868	0.0000	1.00000
Fall	EFK 5.1	2	2.0588	2.91162	141.421	4.1176	0.0000	1.00000
Spring	EFK 6.3	14	1.5300	1.40261	91.674	4.8105	0.0000	0.89307
Fall	EFK 6.3	15	1.1419	1.22034	106.866	3.8627	0.0000	0.83347

Table 9. Regression Statistics for Percent of Piscivores

Location	Season	Total Number of Samples	Slope Estimate (%/y)	Standard Error	Pr > |t|	R^2	95% LCL on Slope	95% UCL on Slope
BCK 0.1	Spring	3	0.64530	0.37043	0.3317	0.7522	-4.0614	5.3520
BCK 0.1	Fall	3	-0.10338	0.75399	0.9133	0.0185	-9.6838	9.4770
BCK 3.3	Spring	12	0.07096	0.04178	0.1203	0.2239	-0.02213	0.1640
BCK 3.3	Fall	11	-0.18118	0.06072	0.0154	0.4973	-0.3185	-0.04382
DBK 0.3	Spring	3	0	0	.	.	.	.
DBK 0.3	Fall	3	1.04241	0.60762	0.3360	0.7464	-6.6782	8.7630
EFK 2.3	Spring	3	2.44365	2.47654	0.5043	0.4933	-29.0238	33.9111
EFK 2.3	Fall	3	-0.46598	1.61050	0.8207	0.0772	-20.9293	19.9974
EFK 5.1	Spring	2	-1.88679	.	.	1.0000	.	.
EFK 5.1	Fall	2	-4.11765	.	.	1.0000	.	.
EFK 6.3	Spring	14	0.13735	0.08273	0.1228	0.1868	-0.04290	0.3176
EFK 6.3	Fall	15	0.02551	0.07535	0.7403	0.0087	-0.1373	0.1883

Table 10. Summary Statistics for Percent of Tolerant Fish

Season	Location	Total Number of Samples	Mean	Standard deviation	Coefficient of Variation	Maximum	Minimum	Probability for Normality
Spring	BCK 0.1	3	51.8159	4.1786	8.0643	55.6600	47.3684	0.98436
Fall	BCK 0.1	3	48.1005	9.4911	19.7318	58.7786	40.6250	0.91461
Spring	BCK 3.3	12	58.4497	9.9740	17.0643	73.0038	40.1015	0.87773
Fall	BCK 3.3	11	68.2926	7.6554	11.2096	81.3056	54.1516	0.97953
Spring	DBK 0.3	3	37.8775	5.6173	14.8301	41.9643	31.4721	0.87222
Fall	DBK 0.3	3	43.7467	13.8871	31.7444	57.9268	30.1724	0.99857
Spring	EFK 2.3	3	25.2891	1.2743	5.0390	26.7606	24.5455	0.75540
Fall	EFK 2.3	3	27.8132	5.3143	19.1070	33.0317	22.4080	0.99907
Spring	EFK 5.1	2	34.9057	5.3367	15.2888	38.6792	31.1321	1.00000
Fall	EFK 5.1	2	26.2954	1.0797	4.1060	27.0588	25.5319	1.00000
Spring	EFK 6.3	14	34.1291	14.0472	41.1591	62.0853	17.8218	0.91796
Fall	EFK 6.3	15	36.2034	13.1945	36.4454	64.5274	20.4082	0.90535

Table 11. Regression Statistics for Percent of Tolerant Fish

Location	Season	Slope Estimate (%/y)	Standard Error	Pr > |t|	R^2	95% LCL on Slope	95% UCL on Slope
BCK 0.1	Spring	2.03538	1.82766	0.4658	0.5536	-21.1873	25.2581
BCK 0.1	Fall	-6.17823	0.66000	0.0678	0.9887	-14.5644	2.2079
BCK 3.3	Spring	-1.19142	0.65955	0.1010	0.2460	-2.6610	0.2782
BCK 3.3	Fall	0.00603	0.70873	0.9934	0.0000	-1.5972	1.6093
DBK 0.3	Spring	3.24201	1.73559	0.3129	0.7772	-18.8108	25.2948
DBK 0.3	Fall	3.29827	8.47186	0.7636	0.1316	-104.35	110.94
EFK 2.3	Spring	0.15253	0.82017	0.8829	0.0334	-10.2688	10.5738
EFK 2.3	Fall	-1.23830	3.25118	0.7683	0.1267	-42.5485	40.0718
EFK 5.1	Spring	-7.54717	.	.	1.0000	.	.
EFK 5.1	Fall	-1.52691	.	.	1.0000	.	.
EFK 6.3	Spring	-0.70583	0.89594	0.4461	0.0492	-2.6579	1.2463
EFK 6.3	Fall	1.18877	0.74892	0.1365	0.1623	-0.4292	2.8067

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APPENDIX B
POWER ANALYSIS

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Power Analysis

The program TRENDS was used to calculate the power to detect a trend over the monitoring period. TRENDS was obtained at the following address on the web site of the Southwest Fisheries Science Center of the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration: http://swfsc.nmfs.noaa.gov/prd/software/Trends.html.

The power analysis in this program is based on a simple linear regression. The TRENDS program is summarized in 6 parameters: duration of study, sampling frequency, rate of change, measurement variability, alpha (type 1 error rate), and power (1-beta, where beta is the type 2 error rate). The TRENDS program estimates any one of the parameters if the other 5 are specified.

Power analysis tables were constructed using the TRENDS program. The tables report the statistical power for detecting a linear trend over a range of parameters that cover realistically expected ranges of sampling periods, sampling frequencies, alpha levels, rates of change, and measurement variability (coefficient of variation) at ED-1. The ranges chosen were: a 5-year (Tables 1 through 12) and 10-year sampling period (Tables 13 through 24); alpha levels of 0.05 (Tables 1 to 4 and 13-16), 0.10 (Tables 5 to 8 and 17-20), and 0.15 (Tables 9 to 12 and 21-24); and coefficients of variation of 20% (Tables 1, 5, 9, 13, 17, and 21), 40% (Tables 2, 6, 10, 14, 18, and 22), 60% (Tables 3, 7, 11, 15, 19, and 23), and 120% (Tables 4, 8, 12, 16, 20, and 24). The rows of each table show the power for a different sampling frequency from once-every-other-year to 4 samples per year. The columns of each table show a hypothetical rate of change per year from -20% to +5%.

To determine the power to detect a trend, find the variability of the measurement of interest by selecting the coefficient of variation (CV) from the summary statistics and select the monitoring period of interest. Then look at the power table for that CV and monitoring period. Look at Table 13 if the CV is 20% and the monitoring period 10 years. The table shows that if sampling is conducted once per year and the desired confidence is P = 0.95 (alpha = 0.05), the power to detect a decrease of 5% per year is 0.76. That means that there is a 76% chance that the trend would be detected.

These power analysis tables can be used prior to sampling to estimate the number of samples needed to achieve a desired power. They can be used after sampling to estimate the power achieved by the sampling effort given the actual CV of the data and the observed percentage difference of means.

References

http://swfsc.nmfs.noaa.gov/prd/software/Trends.html

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Gerrodette, T. 1991. Models for power of detecting trends – a reply to Link and Hatfield. Ecology 72: 1889-1892.

Gerrodette, T. 1993. Trends: Software for a power analysis of linear regression. Wildlife Society Bulletin 21: 515-516

Table 1. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.05 and 20% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.43	0.2	0.13	0.12	0.12	0.13
1 Sample/year	0.92	0.39	0.16	0.11	0.1	0.15
2 Samples/year	1	0.62	0.24	0.14	0.13	0.21
4 Samples/year	1	0.85	0.35	0.18	0.17	0.31

Table 2. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.05 and 40% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.23	0.13	0.11	0.11	0.11	0.11
1 Sample/year	0.47	0.17	0.1	0.08	0.08	0.09
2 Samples/year	0.73	0.25	0.12	0.09	0.08	0.11
4 Samples/year	0.93	0.38	0.16	0.1	0.1	0.14

Table 3. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.05 and 60% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.17	0.12	0.11	0.11	0.11	0.11
1 Sample/year	0.28	0.12	0.08	0.07	0.07	0.08
2 Samples/year	0.44	0.16	0.09	0.07	0.07	0.09
4 Samples/year	0.67	0.23	0.11	0.08	0.08	0.1

Table 4. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.05 and 120% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.12	0.11	0.11	0.11	0.11	0.11
1 Sample/year	0.14	0.08	0.07	0.06	0.06	0.07
2 Samples/year	0.19	0.09	0.07	0.06	0.06	0.07
4 Samples/year	0.27	0.12	0.08	0.06	0.06	0.07

Table 5. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.10 and 20% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.74	0.38	0.24	0.2	0.19	0.23
1 Sample/year	0.98	0.59	0.29	0.2	0.19	0.27
2 Samples/year	1	0.77	0.37	0.24	0.23	0.34
4 Samples/year	1	0.93	0.5	0.3	0.29	0.46

Table 6. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.1 and 40% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.43	0.24	0.19	0.18	0.18	0.19
1 Sample/year	0.68	0.3	0.18	0.15	0.14	0.17
2 Samples/year	0.86	0.4	0.21	0.16	0.16	0.2
4 Samples/year	0.97	0.54	0.26	0.18	0.18	0.24

Table 7. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.1 and 60% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.32	0.21	0.18	0.17	0.17	0.18
1 Sample/year	0.46	0.22	0.15	0.13	0.13	0.15
2 Samples/year	0.61	0.27	0.17	0.14	0.14	0.16
4 Samples/year	0.8	0.36	0.2	0.15	0.15	0.19

Table 8. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.1 and 120% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.22	0.18	0.17	0.17	0.17	0.17
1 Sample/year	0.25	0.16	0.13	0.12	0.12	0.13
2 Samples/year	0.31	0.17	0.13	0.12	0.12	0.13
4 Samples/year	0.41	0.21	0.14	0.12	0.12	0.14

Table 9. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.15 and 20% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.9	0.54	0.34	0.28	0.27	0.32
1 Sample/year	1	0.71	0.39	0.28	0.27	0.36
2 Samples/year	1	0.85	0.48	0.32	0.31	0.44
4 Samples/year	1	0.96	0.61	0.39	0.38	0.56

Table 10. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.15 and 40% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.6	0.35	0.26	0.24	0.24	0.26
1 Sample/year	0.79	0.41	0.26	0.21	0.21	0.25
2 Samples/year	0.91	0.5	0.29	0.23	0.22	0.28
4 Samples/year	0.98	0.64	0.35	0.26	0.25	0.33

Table 11. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.15 and 60% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.45	0.29	0.24	0.23	0.23	0.24
1 Sample/year	0.58	0.31	0.22	0.19	0.19	0.21
2 Samples/year	0.71	0.37	0.24	0.2	0.2	0.23
4 Samples/year	0.86	0.46	0.27	0.22	0.21	0.26

Table 12. Power to Detect Change Using Linear Regression Over a 5-Year Sampling Period at an Alpha Level of 0.15 and 120% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.31	0.25	0.23	0.22	0.22	0.23
1 Sample/year	0.34	0.23	0.19	0.17	0.17	0.18
2 Samples/year	0.41	0.25	0.19	0.17	0.17	0.19
4 Samples/year	0.51	0.28	0.21	0.18	0.18	0.2

Table 13. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.05 and 20% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	1	0.92	0.39	0.2	0.18	0.3
1 Sample/year	1	1	0.76	0.38	0.32	0.59
2 Samples/year	1	1	0.95	0.58	0.49	0.83
4 Samples/year	1	1	1	0.82	0.72	0.97

Table 14. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.05 and 40% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.96	0.47	0.17	0.11	0.1	0.14
1 Sample/year	1	0.87	0.32	0.17	0.15	0.24
2 Samples/year	1	0.99	0.49	0.24	0.2	0.36
4 Samples/year	1	1	0.73	0.36	0.3	0.56

Table 15. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.05 and 60% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.75	0.28	0.12	0.09	0.08	0.11
1 Sample/year	1	0.59	0.2	0.12	0.11	0.15
2 Samples/year	1	0.82	0.29	0.15	0.13	0.22
4 Samples/year	1	0.97	0.45	0.22	0.18	0.33

Table 16. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.05 and 120% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.33	0.14	0.08	0.07	0.07	0.08
1 Sample/year	0.81	0.24	0.11	0.08	0.07	0.09
2 Samples/year	0.97	0.36	0.14	0.09	0.08	0.11
4 Samples/year	1	0.56	0.19	0.11	0.1	0.15

Table 17. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.1 and 20% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	1	0.98	0.59	0.34	0.31	0.48
1 Sample/year	1	1	0.88	0.54	0.47	0.75
2 Samples/year	1	1	0.98	0.72	0.64	0.91
4 Samples/year	1	1	1	0.9	0.84	1

Table 18. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.1 and 40% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	1	0.6	0.3	0.2	0.19	0.26
1 Sample/year	1	0.98	0.48	0.28	0.25	0.38
2 Samples/year	1	1	0.65	0.37	0.32	0.51
4 Samples/year	1	1	0.84	0.5	0.44	0.7

Table 19. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.1 and 60% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.9	0.46	0.22	0.17	0.16	0.2
1 Sample/year	1	0.74	0.32	0.21	0.19	0.26
2 Samples/year	1	0.91	0.43	0.26	0.23	0.34
4 Samples/year	1	0.99	0.59	0.34	0.3	0.47

Table 20. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.1 and 120% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.51	0.25	0.16	0.13	0.13	0.15
1 Sample/year	0.7	0.31	0.17	0.14	0.13	0.16
2 Samples/year	0.88	0.41	0.21	0.15	0.15	0.18
4 Samples/year	0.98	0.57	0.26	0.18	0.17	0.22

Table 21. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.15 and 20% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	1	1	0.71	0.45	0.41	0.61
1 Sample/year	1	1	0.93	0.65	0.58	0.83
2 Samples/year	1	1	0.99	0.8	0.73	0.95
4 Samples/year	1	1	1	0.94	0.89	1

Table 22. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.15 and 40%a CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	1	0.79	0.41	0.29	0.27	0.35
1 Sample/year	1	0.97	0.58	0.37	0.34	0.48
2 Samples/year	1	1	0.74	0.46	0.42	0.61
4 Samples/year	1	1	0.89	0.6	0.54	0.78

Table 23. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.15 and 60% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.96	0.58	0.31	0.24	0.23	0.28
1 Sample/year	1	0.82	0.42	0.29	0.27	0.35
2 Samples/year	1	0.95	0.53	0.34	0.31	0.44
4 Samples/year	1	1	0.69	0.43	0.39	0.57

Table 24. Power to Detect Change Using Linear Regression Over a 10-Year Sampling Period at an Alpha Level of 0.15 and 120% CV.

	Change Per Year					
Sampling Frequency	**-20%**	**-10%**	**-5%**	**-3%**	**+3%**	**+5%**
1 Sample every other year	0.64	0.34	0.23	0.19	0.19	0.21
1 Sample/year	0.79	0.41	0.25	0.2	0.2	0.23
2 Samples/year	0.93	0.51	0.28	0.22	0.21	0.25
4 Samples/year	1	0.66	0.34	0.25	0.24	0.3

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