

**Threatened and Endangered Species  
Evaluation for 75 Licensed Commercial  
Nuclear Power Generating Plants**

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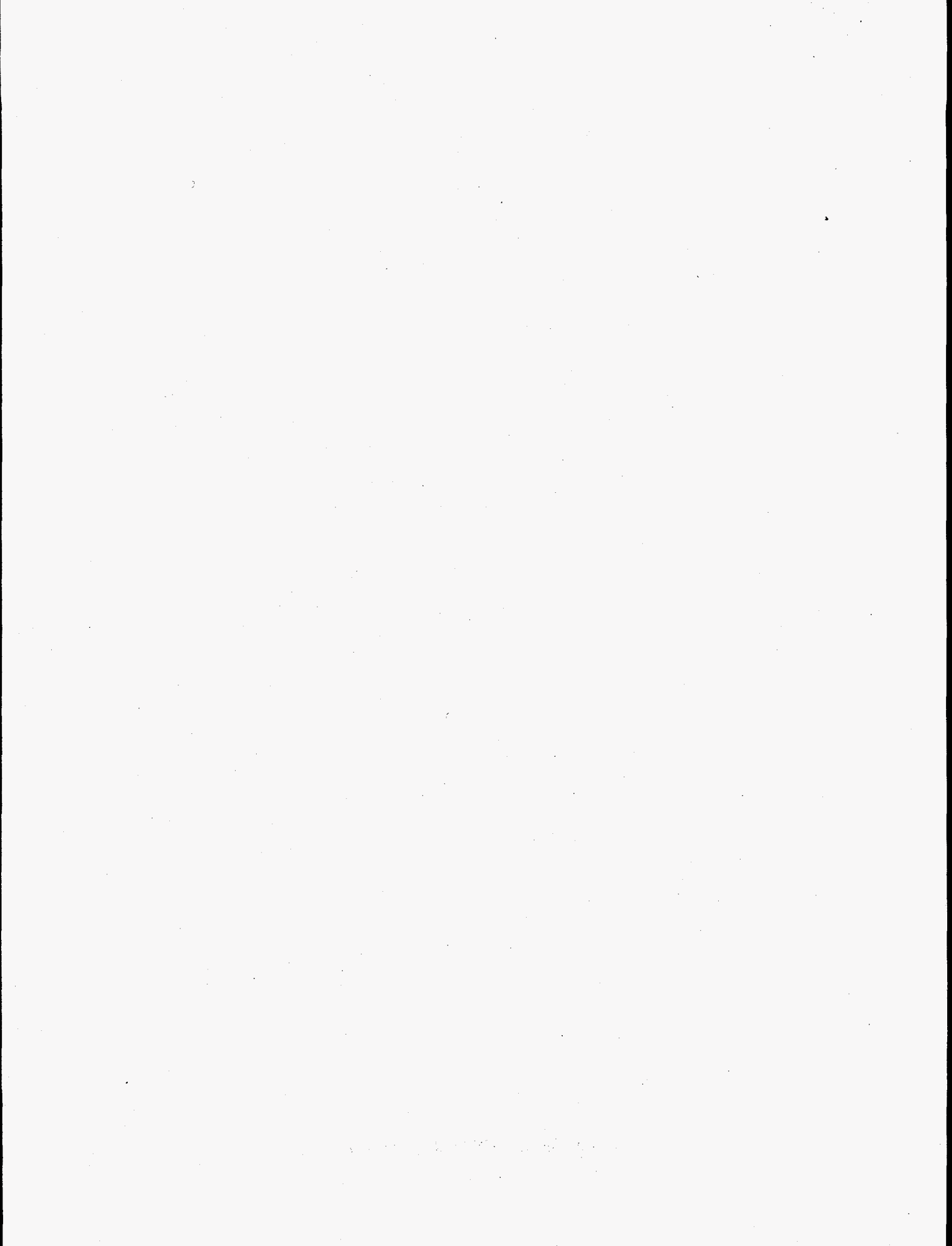
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## EXECUTIVE SUMMARY

The Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531, et seq.), as amended, and related implementing regulations require that federal agencies ensure that any action authorized, funded, or carried out under their jurisdiction is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of critical habitats for such species. The issuance and maintenance of a federal license, such as a construction permit or operating license issued by the U.S. Nuclear Regulatory Commission (NRC) for a commercial nuclear power generating facility is a federal action under the jurisdiction of a federal agency, and is therefore subject to the provisions of the ESA.

The Office of Nuclear Reactor Regulation (NRR) staff have performed appropriate assessments of potential impacts to threatened or endangered species, and consulted with appropriate agencies with regard to protection of such species in authorizing the construction and operation of nuclear power generating facilities. However, for the majority of the licensed commercial nuclear power generating facilities, these assessments and consultations were performed during the 1970s or early 1980s, and have not been re-evaluated or updated since those initial evaluations.

Although the NRC is not aware of any non-compliance with the ESA by any of its licensees, the NRR staff have determined, based on their experience and the periodic inclusion of additional species on the lists maintained at 50 CFR 17.11 and 50 CFR 17.12, that a review of the current status of ESA compliance at each licensed commercial nuclear power generating facility is warranted. To this end, the NRR staff requested Pacific Northwest National Laboratory (PNNL) assistance in the development of a review process and a database that can be used to ensure that all commercial nuclear power plants under NRC licensing purview are in compliance with the ESA. This would in turn ensure the continued preservation of species protected under the ESA that may be present at or near these facilities and might be impacted by the facilities. This report documents the systematic survey effort used to determine compliance with the ESA by commercial nuclear power generating facilities licensed by the NRC, and the results of that survey.

The purpose of this evaluation is to review the available information for each licensed commercial nuclear power generating facility to 1) determine whether there have been any instances when a licensed generating facility has failed to undertake actions required by the ESA, and 2) determine the potential for facility or transmission line operations to adversely impact threatened or endangered species at a particular site. The scope is limited to an estimation of the potential for adverse impacts at each site, and is not designed to fully evaluate all potential effects on all threatened or endangered species. More detailed analyses of effects and evaluations of impacts should be directed, in the future, to those sites identified through this broad-scale evaluation as having the greatest potential for adversely affecting threatened or endangered species.

Questions specifically addressed for each site include the following:

- Are there any incidental takes of threatened or endangered species known to be occurring?
- Have adequate or proper consultations with U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) been conducted?
- What and how many threatened or endangered species are potentially affected by the facility?
- What are the potentials for direct or indirect impacts to those species?

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- What additional information is needed to determine ESA compliance?
- What NRC staff actions are required to assure compliance with the ESA?

Information was gathered from the Final Environmental Statement (FES) for each site, NUDOCs, information requests to the USFWS and NMFS, various on-line sources, books, and other data sources. Direct contacts or requests for information to the licensees were not performed. The information was compiled in an electronic database that was then used to develop a weighting or ranking system to compare and prioritize the potential for adverse impacts to threatened or endangered species at each of the 75 licensed commercial nuclear generating facility sites.

No cases were found where an incidental take (defined, in part, as the "killing, harming, or harassment" of a federally listed species, that is incidental to, but not the purpose of, an otherwise lawful activity) had occurred that was not followed by consultations with the appropriate resource agency. However, it was found that the potential exists at every site that undocumented incidental take could occur, primarily because the NRC staff and the licensees may not be aware that a threatened or endangered species may be present near a facility.

Of the 75 sites examined, 44 were assigned either low or moderate-to-low priority for detailed follow-up evaluations because the potential for noncompliance with the ESA was determined to be small or negligible because very few threatened or endangered species are present in the vicinity and/or the potential for adverse impacts due to the facility are small. The other 31 sites most likely are not adversely affecting any threatened or endangered species, but have been assigned either high (15 sites) or moderate-to-high (16 sites) priority for detailed follow-up evaluations because uncertainties concerning potential impacts to one or more species were identified that would need to be addressed before full compliance with the ESA can be assured.

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**ABBREVIATIONS AND ACRONYMS**

EMF	electromagnetic field
EPA	U.S. Environmental Protection Agency
EPP	Environmental Protection Plan
ESA	Endangered Species Act
FES	final environmental statement
GEN&SIS	Geographical, Environmental, and Siting Information System
LLNL	Lawrence Livermore National Laboratory
NMFS	National Marine Fisheries Service
NPDES	National Pollution Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
PNNL	Pacific Northwest National Laboratory
USFWS	U.S. Fish and Wildlife Service

## 1.0 INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531, et seq.), as amended, and related implementing regulations of the jurisdictional federal agencies, the U.S. Departments of Commerce and Interior, at 50 CFR Part 17.1, et seq., require that federal agencies ensure that any action authorized, funded, or carried out under their jurisdiction is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of critical habitats for such species. The issuance and maintenance of a federal license, such as a construction permit or operating license issued by the U.S. Nuclear Regulatory Commission (NRC) for a commercial nuclear power generating facility is a federal action under the jurisdiction of a federal agency, and is therefore subject to the provisions of the ESA.

The U.S. Department of the Interior (through the Fish and Wildlife Service), and the U.S. Department of Commerce (through the National Marine Fisheries Service), share responsibility for administration of the ESA. The National Marine Fisheries Service (NMFS) deals with species that inhabit marine environments and anadromous fish, while the U.S. Fish and Wildlife Service (USFWS) is responsible for terrestrial and freshwater species and migratory birds. A species (or other distinct taxonomic unit such as subspecies, variety, and for vertebrates, distinct population units) may be classified for protection as "endangered" when it is in danger of extinction within the foreseeable future throughout all or a significant portion of its range. A "threatened" classification is provided to those animals and plants likely to become endangered within the foreseeable future throughout all or a significant portion of their ranges. As of February 1997, there were about 1067 species listed under the ESA in the United States (846 endangered, 221 threatened). Additionally there were approximately 125 species currently proposed for listing as threatened or endangered, and another 183 species considered to be candidates for formal listing proposals.

### 1.1 Responsibilities Under the Endangered Species Act

Three sections of the ESA directly affect NRC licensing activities, these are Sections 7, 9, and 10. Section 7 of the ESA requires that all federal agencies consult with the appropriate service when any activity permitted, funded or conducted by that agency may affect a listed species or designated critical habitat, or is likely to jeopardize proposed species or adversely modify proposed critical habitat. The purpose of this consultation is to identify and quantify potential adverse affects on listed species, and to develop reasonable and prudent measures that will aid in the conservation of the listed species. In most cases of NRC licensing activities, this has taken the form of an informal consultation at the time of the licensing action, or in a few instances, has occurred subsequent to the licensing action in the form of a formal consultation when actual or potential impacts to one or more listed species were discovered.

Section 9 of the ESA prohibits the taking of federally listed species without appropriate authorization. Take is defined under the ESA, in part, as "killing, harming, or harassment" of a federally listed species. Section 10 of the ESA provides a mechanism by which the jurisdictional agency can authorize an exemption to the provisions of Section 9, in the form of an incidental take permit. Incidental take is take that is "incidental to, and not the purpose of, otherwise lawful activities." Incidental take permits are normally issued only if it is determined that the take will not appreciably reduce the likelihood of the survival and recovery of the species; that the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of the taking; and that the applicant will ensure that other measures that the USFWS and/or NMFS may require as being necessary or appropriate will be provided.

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The NRC has the responsibility under the ESA at the time of a licensing activity to either perform or ensure that the following actions are performed:

- determine what species listed under the ESA are potentially affected by the proposed action
- assess the potential impacts of the proposed action on those species
- consult, either formally or informally as appropriate, with the jurisdictional agencies with regard to the potential impacts of the proposed action
- work with the jurisdictional agency to secure an incidental take permit if incidental take of one or more species is determined to be likely, and the issuance of such a permit is appropriate.

The Office of Nuclear Reactor Regulation (NRR) staff have performed appropriate assessments of potential impacts to threatened or endangered species, and consulted with appropriate agencies with regard to protection of such species in authorizing the construction and operation of nuclear power generating facilities. Guidance for performing these assessments were outlined in NUREG-0555 "Environmental Standard Review Plan for the Environmental Review of Construction Permit Applications for Nuclear Power Plants," (ESRP) which was issued in 1978. The ESRP was not available for the evaluation of the majority of licensed commercial nuclear power generating plants. The assessments and consultations concerning most of the facilities were performed during the 1970s or early 1980s, and have not be re-evaluated or updated since those initial evaluations.

During normal operations of a nuclear facility, the NRC has the oversight responsibility to

- ensure that facility operations do not jeopardize any listed species or adversely modify critical habitats for those species
- work with the licensee and the jurisdictional agency, if unforeseen take does occur, to develop mitigative measures to minimize any future takes and secure an incidental take permit if needed and appropriate.

The licensee is prohibited under the ESA from taking listed species or from adversely modifying designated or proposed critical habitats for listed species. In most cases it is a license requirement to report to the NRC the mortality of any species listed under the ESA. If during the course of normal operations an unexpected take does occur, the licensee must work with the jurisdictional agency and the NRC to develop appropriate mitigative measures to minimize or prevent future takes and to secure an incidental take permit, if needed and appropriate.

Although the NRC is not aware of any noncompliance with the ESA by any of its licensees, the NRR staff have determined, based on their experience and the periodic inclusion of additional species on the lists maintained at 50 CFR 17.11 and 50 CFR 17.12, that a review of the current status of ESA compliance at each licensed commercial nuclear power generating facility is warranted. To this end, the NRR staff have requested Pacific Northwest National Laboratory (PNNL) assistance in the development of a review process and a database that can be used to ensure that all commercial nuclear power plants under NRC licensing purview are in compliance with the ESA. This would in turn ensure the continued preservation of species protected under the ESA that may be present at or near these facilities and might be impacted by the facilities.

This report documents the systematic survey effort used to determine compliance with the ESA by commercial nuclear power generating facilities licensed by the NRC, and the results of that survey.



## *Threatened and Endangered Species Evaluation*

### **1.2 Purpose and Scope**

The purpose of this evaluation is to review the available information for each licensed commercial nuclear power generating facility to 1) determine whether there have been any instances when a licensed generating facility has failed to undertake actions required by the ESA, and 2) determine the potential for facility or transmission line operations to adversely impact threatened or endangered species at a particular site.

The scope is limited to the determination of the potential for adverse impacts at each site, and is not designed to fully evaluate all potential effects on all threatened or endangered species. More detailed analyses of effects and evaluations of impacts should be directed, in the future, to those sites identified through this broad-scale evaluation as having the greatest potential for adversely affecting threatened or endangered species.

Questions specifically addressed for each site include the following:

- Are there any incidental takes of threatened or endangered species known to be occurring?
- Have adequate or proper consultations with USFWS and/or NMFS been conducted?
- What and how many threatened or endangered species are potentially affected by the facility?
- What are the potentials for direct or indirect impacts to those species?
- What additional information is needed to determine ESA compliance?
- What NRC staff actions are required to assure compliance with the ESA?

With regard to the first question, we found no documented cases of incidental takes that were not followed by consultations with the appropriate resource agency. However, the potential exists at every site that undocumented incidental take may occur, primarily because the NRC staff and the licensees may not be aware that a threatened or endangered species may be present near a facility. If the NRC and/or the licensee are unaware of the presence of a particular listed species, incidental takes may go unnoticed, and appropriate monitoring may not be performed. All cases of incidental take that were identified during this survey were invariably of an obvious nature, such as the impingement of shortnose sturgeon on an intake screen. To our knowledge, all takes of this type were handled appropriately by the NRC and the licensees. Other cases of take may not be as obvious, such as the disruption of bird nesting activities by transmission line maintenance. This type of impact was not detectable at the scale of this evaluation.

For over half of the 75 sites examined, the potential for noncompliance with the ESA appears to be small or negligible because very few threatened or endangered species are present in the vicinity and/or the potential for adverse impacts due to the facility are small. The other sites most likely are not adversely affecting any threatened or endangered species, but uncertainties concerning potential impacts to one or more species have been identified that would need to be addressed before full compliance with the ESA can be assured. As an example, the information currently compiled is insufficient to fully evaluate the potential effects of transmission corridor operation and maintenance on proposed Louisiana black bear critical habitat near the River Bend facility.

One product of this report is the development and application of a ranking system that can be used to prioritize follow-up actions for those sites with uncertainties associated with potential impacts to endangered or threatened species. The particular uncertainties identified for each site form the basis for the recommended follow-up actions, and the priority assigned to each site is a measure of the number of uncertainties and/or the potential magnitude of those uncertainties.

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Detailed analyses of potential indirect effects are beyond the scope of this evaluation, such as an analyses of thermal plume effects on benthic microfauna and flora and subsequent effects on the food supply for a rare fish species. Likewise, detailed evaluation of many direct impacts are not possible with the level of information currently available for each site. For instance, there is, in most cases, insufficient data on the routing of transmission lines to determine if any habitat required by a rare plant species is included in the transmission line corridors.

### **1.3 Impacts of Nuclear Power Plants on Threatened and Endangered Species**

The potential ecological impacts of commercial nuclear power plant operation were examined within the "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437) issued in June 1996. These impacts are not discussed in detail here, but the primary potential aquatic effects are summarized in Table 1, and the primary potential terrestrial effects are summarized in Table 2. These potential impacts were considered in the overall evaluation for each power plant site. NUREG-1437 determined that most of the potential ecological impacts listed in Tables 1 and 2 are minor and that they can be considered generically with regard to license renewal and that detailed facility-specific evaluations are not required for license renewal. However, NUREG-1437 does conclude that threatened and endangered species issues cannot be treated generically, and must be considered on a site-specific basis.

For the purposes of this report a distinction is made between potential impacts to threatened or endangered species and more generalized ecological impacts of a facility. In theory, a particular facility could have significant ecological impacts but no impacts to threatened or endangered species (if there are no such species naturally occurring in the vicinity). Conversely, a particular facility could have adverse effects on one or more threatened or endangered species without an observable overall ecological impact. For instance, a small alteration of the aquatic temperature regime could cause a population decline of a threatened mussel species that makes up a very small proportion of the overall mussel community without causing observable changes in the total number of individual mussels, the size of fish populations, aquatic vegetation, or any other observable parameter.

### **1.4 Evaluation Methodology**

The evaluation of the potential for each licensed nuclear power plant to adversely impact threatened or endangered species was conducted using a 4-step process:

- 1) Gather available information concerning threatened and endangered species and pertinent facility-specific information for each power plant site from the Final Environmental Statements (FESs), NUDOCs, information requests to USFWS and NMFS, and other sources.
- 2) Compile the information into an electronic database.
- 3) Use the database to develop and apply a weighting or ranking system to produce an initial prioritization of sites using a standardized set of criteria such as type of water body affected, length of transmission lines, the number of threatened or endangered species present, etc.
- 4) Use the results of the initial ranking system, combined with all other available facility-specific information to assign a final priority level for detailed follow-up actions to each licensed commercial nuclear power facility site.

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The methods and results for the first 2 steps in the process are described in Section 2.0. The initial ranking system is described in Section 3.0 and the assignments of priority levels are described in Section 4.0. Section 5.0 provides conclusions and recommendations for follow-up actions.

Table 1. Summary of Potential Aquatic Effects of Power Plant Operations

Potential Effect	Summary
Altered salinity gradient	Tends to be minor and within range of normal seasonal or tidal changes in salinity.
Altered thermal stratification	Can be a substantial ecological effect, but the largest stratification changes occur in artificial reservoirs that usually do not have many threatened or endangered species.
Sediment scouring	Tends to be localized near the point of high velocity discharge structures. May be important depending on site-specific conditions.
Enhanced eutrophication	If this occurs, it could result in the loss of habitat for some threatened or endangered species. However, it has not been shown to be occurring at any operating nuclear power facility.
Discharge of chlorine and biocides	Regulated by the NPDES permits, many facilities have reduced biocide use, or have adopted other ways to clean condenser piping.
Heavy metals	This is regulated by the NPDES permits. Normally not serious, but there have been problems with copper, especially following periods of facility shut-down. Therefore there may be indirect effects of heavy metals on threatened or endangered species present in the area.
Entrainment of fish and shellfish	Potential major issue for all nuclear facilities that have threatened or endangered fish or shellfish in the vicinity.
Impingement	Potential major issue for facilities that have threatened or endangered fish, shellfish, sea turtles, or other rare aquatic species in the vicinity.
Heat Shock	Tends to be localized near the point of discharge, but could be a potential effect on threatened or endangered species.
Cold Shock	Can occur to warm-water acclimated organisms when a facility is shut down. Tends to be localized, but is a potential effect on threatened or endangered species.
Indirect thermal plume effects	Thermal plumes may alter metabolic rates, benthic community composition, parasitism, and disease rates, stimulate nuisance organisms or create barriers to fish migration. In some cases, these could be important considerations for rare species ecology.
Gas Bubble Disease	Mainly occurs to fish inhabiting discharge canals, probably not a general problem for threatened or endangered species.

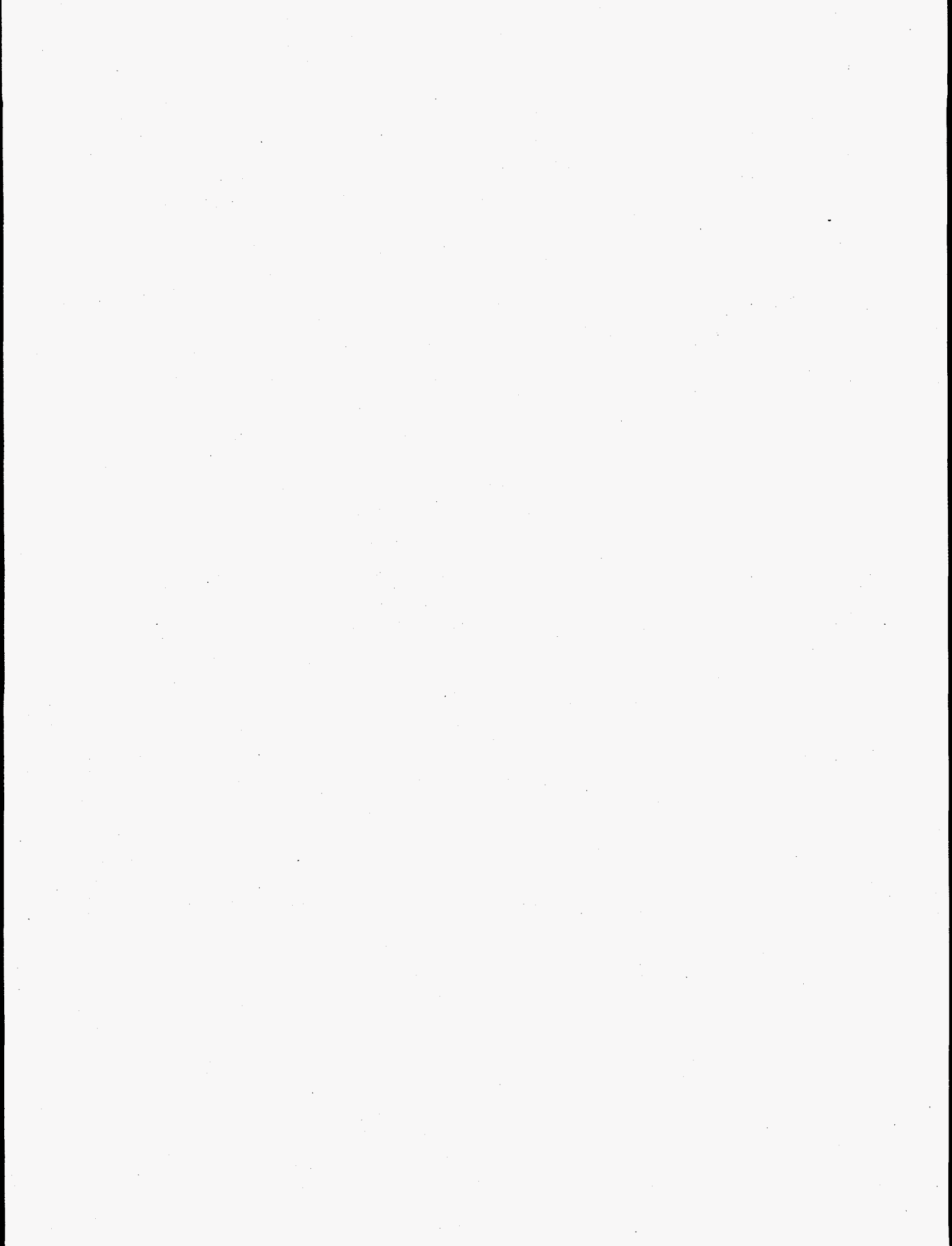
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Table 1. Summary of Potential Aquatic Effects of Power Plant Operations

Potential Effect	Summary
Low dissolved oxygen in discharge waters	May aggravate heat stress effects. Normally not a major concern, but is a potential problem for threatened or endangered species.

Table 2. Summary of Potential Terrestrial Effects of Power Plant Operations

Potential Effect	Summary
Salt Drift	Usually minor and relatively localized, probably not a major effect on threatened or endangered species
Icing	Normally a localized effect, may alter habitat for some species, but probably is not a major effect on threatened or endangered species.
Bird Collisions - Cooling Towers and other Plant Site Structures	Cooling towers can cause significant bird collisions if they are not well lit. Other structures at the plant site should not be significantly different from any other building, and are probably not a significant problem for threatened or endangered species.
Bird Collisions - Transmission lines	The number of bird collisions with transmission lines is not known, especially in non-wetland areas. May be most prevalent near wetland areas occupied by many birds. Can be a major issue if the lines pass through habitats that support concentrated populations of rare bird species.
Transmission line right-of-way maintenance	Probably the greatest potential impact to rare plant and insect species, because they could be affected by almost all maintenance operations such as herbicides, mowing, vehicular trampling, etc. This aspect of transmission line maintenance was not evaluated in the License Renewal GEIS.
Electromagnetic fields (EMF)	EMFs can effect growth of plant parts near energized lines, but generally do not effect overall plant growth of trees, and probably have little effect on shrubs or herbaceous plants physically separated from the lines. Effects of EMFs on wildlife appear to be minimal.
Electrocution	This was a major concern mentioned by several USFWS field offices, especially for raptors. This was not evaluated in the License Renewal GEIS.



## **2.0 DATA COLLECTION AND COMPILATION**

### **2.1 Sources and Types of Information Collected**

The data compiled to support the identification of potential ESA-related issues include information concerning the threatened, endangered, proposed, and candidate species that are potentially present in the vicinity of each site or associated transmission lines as identified via

- the FES or other environmental documents
- the Geographical, Environmental, and Siting Information System (GEn&SIS) database program developed by Lawrence Livermore National Laboratory (LLNL)
- responses to information requests sent to the USFWS and NMFS
- information from several on-line natural heritage databases; from NUDOCs; specific site knowledge (in the case of WNP-2); and other sources such as books, journals, and other published material.

None of these sources of information should be considered as comprehensive or completely accurate, and each source identified potential species occurrences that were not identified by any other source. In general, the information provided directly from the USFWS may be the most accurate and current, but there were many cases that the USFWS did not indicate the presence of a species when it was clear in the FES that a particular species occurred in the area, at least at the time the FES was prepared. Many of the FESs provide what appear to be generic checklists of animals found in the state or region, without clear indication of which, if any, of the species realistically could be expected near the site. The methods used by GEn&SIS to identify potential species occurrences result (in some cases) in lists of species that may actually only occur in very different ecological settings than the area around the facility or associated transmission lines.

Even with the known limitations of each source of information, when taken together, a fairly clear picture can be discerned of the types and numbers of rare species in the vicinity of each site.

Other information compiled includes results of NUDOCs searches for information about endangered species occurrences or management at each site and licensee policies or procedures as given in the Environmental Protection Plan (EPP) regarding the protection of threatened or endangered species and any reporting requirements that may be in place for a particular site.

For this preliminary work in support of the NRR Task Action Plan, the staff limited the information sources to publicly available information. This did not include direct contact with the licensees. The NRC staff determined that this report would be a broad-scale evaluation for the general purposes of determining agency compliance with the ESA in regard to its licensing activities, screening all of the licensed nuclear power generating facilities to identify potential impacts to threatened or endangered species, and prioritizing the sites for detailed follow-up assessments. The NRC staff determined that issuance of a request for information to all licensees would constitute a survey that was not warranted for the broad-scale evaluation summarized in this report. Follow-up activities on a facility-specific basis will be conducted if warranted.



### **2.1.1 Agency Responses to the Request for Information**

Requests for information about species that may occur in the vicinity of each of the licensed commercial nuclear power generating facilities were sent by the NRC to the appropriate regional offices of the USFWS and NMFS. Specific information requested included

- species listed under the ESA as endangered, threatened, proposed, or candidate level 1 or 2 that are known to occur within 10 miles of the plant site or associated transmission lines
- species listed as endangered, threatened, proposed, or candidate 1 or 2 that, based on species-specific attributes and/or professional judgment, could be affected by the operation of the power plant or by the operation and maintenance of the associated transmission lines
- locations of any designated critical habitats near the plant or transmission lines
- known habitat preferences or requirements for any species of concern that may be potentially affected by plant or transmission line operations and maintenance
- results of any formal or informal Section 7 consultations concerning the site
- any incidental take permits issued for plant operations
- any other concerns or potential impacts of power plant or transmission line operation.

An example of the letters sent to the USFWS and NMFS is included as Appendix A.

Responses were received from USFWS for all sites except Fort St. Vrain (which is currently being decommissioned). Responses from NMFS were received from the Northeast region and part of the Southeast region. A phone call was received from the NMFS Southwest region, but letters for the Diablo Canyon and San Onofre facilities were never received. This data gap did not affect the overall evaluation process because both of these sites were identified as being high priorities for follow-up actions even without the latest NMFS information. Inadvertently, the request letter to the Northwest region was not sent. This is probably not a serious data gap because the only two sites affected are Trojan (which is being decommissioned), and WNP-2, where the only species under NMFS jurisdiction that are potentially affected are some Snake River salmon, for which information is available from other sources.

Each of the USFWS regional offices transmitted the requests for information to the appropriate field offices in each state where the licensed facilities are located. The responses provided by the field offices varied greatly. At the low end of the quality range were the responses for Arkansas, Grand Gulf, and Crystal River. In each of these cases it appears that the effort given to the information request by the respective field offices was minimal. For example, the 1996 response for Grand Gulf indicated that no listed species were present in the area, but in 1980 the USFWS indicated the potential presence of alligators, red-cockaded woodpeckers, and the bayou darter and requested a biological assessment for these species. Several additional species were identified in the FES and by GEN&SIS as potentially occurring in the vicinity of that facility site. Likewise, for the Arkansas plant, the USFWS indicated that no listed species were present, but the FES indicated that bald eagles were in the area and GEN&SIS identified several additional species in the plant area. For the Crystal River site the USFWS only stated that manatees may be affected at intake and discharge points. However, a large number of other listed species were identified via other data sources.

The most complete response was for South Texas; it included 78 species in all listing categories, arranged in a tabular format that identified each county where each species occurs. Critical and important habitat information was provided, as well as fact sheets for all of the listed species.



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Many of the responses did not include candidate species. This may be partially due to changes in USFWS policy regarding candidate species (see Section 2.7) (i.e., if there are no former Category 1 (C1) species in the area, the field office may have elected not to mention candidates at all). A number of the responses designated the former Category 2 (C2) species using the newer terminology of "species of concern." For all of the sites in California and Florida, where large numbers of former C2 species would be expected, the C2 species were not included in the responses. The responses for both sites in Texas, which also has a large number of former C2 species, did include these species.

About half of the responses included some level of discussion concerning habitat preferences of species potentially occurring in the site vicinity. Based on the information provided, it is clear that accurate determinations of the presence of many species, and evaluations of the impacts to the species from plant or transmission line operations may require more formal interactions with the USFWS and the licensees or even site-specific field investigations.

Very few of the responses included a discussion of which species may be most affected by facility or transmission line operations and maintenance. The exception is a concern, expressed in several responses, about the potential for electrocution of large birds such as bald eagles on transmission lines. Several of the field offices provided guidelines for transmission line tower configurations that minimize the potential for electrocution. The field office in Virginia indicated that Virginia Electric and Power Co. had worked with the USFWS to develop measures to minimize or eliminate this problem and that they had implemented those measures. The subject of avian electrocution was determined to be a generic issue for all sites and is discussed in Section 4.2.2.

### **2.1.2 GEN&SIS**

The GEN&SIS database and mapping system developed by LLNL was found to be a useful tool for evaluating potential threatened and endangered species occurrences in the vicinity of commercial nuclear power generating facilities. This system was developed to assist the NRC in regulatory and licensing activities in the areas of siting and environmental protection. It contains information about diverse subjects areas such as wetlands, nuclear facilities, U.S. Department of Energy facilities, seismic/geological data, superfund sites, demographics, and many other types of information, including threatened and endangered species. GEN&SIS synthesizes maps of many of the parameters, and produces tabular output for those parameters that are not distinctly spatial in nature. Any location within the conterminous United States can be selected for analysis.

The threatened and endangered species information used by GEN&SIS is obtained from a database maintained by the U.S. Environmental Protection Agency (EPA) which is indirectly related to USFWS databases. GEN&SIS is most useful for estimating the number, variety, and general distribution of species that may occur in a particular area. The user inputs a specific location and a desired search radius, and GEN&SIS reports back all of the endangered, threatened, and proposed species that have been reported to occur in each county that occurs at least partially within the search radius. LLNL performed runs with search radii of 32 and 100 km (20 and 62.5 miles) for most of the licensed commercial nuclear power plants, and provided the output data to PNNL.

In general, the output from the GEN&SIS runs match the information obtained directly from the USFWS and NMFS; however, there were cases when the GEN&SIS identified potential species occurrences that were not supported by the USFWS or NMFS, and there were cases when the USFWS or NMFS identified species that were not identified by GEN&SIS.

The data provided by GEN&SIS have limitations that must be understood for proper interpretation of the results. The foremost limitation is that species occurrences are listed by county, with no way to identify if a particular species actually occurs within the selected search radius, or if it actually only occurs within the county, but well outside of the search radius. This is not a significant limitation in areas that are ecologically homogeneous or in regions with relatively small counties. Careful interpretation of the GEN&SIS output data is required in cases where there are major ecological gradients (or distinct ecological breaks) and in areas with large counties.

An obvious example of a sharp ecological break occurs at facilities that are located well inland, but for which coastal counties partially occur within the search radius. For instance, the Peach Bottom site is located on the Susquehanna River, 29 km (18 miles) upstream from Chesapeake Bay. A 32 km (20 mile) search radius indicates that the loggerhead sea turtle is potentially present (a wider search radius identifies several other sea turtles in a number of counties). Obviously, sea turtles are highly unlikely to be affected by operation of the Peach Bottom facility. This example (marine species at an inland site) is easy to identify during data evaluation; however, other ecological breaks or gradients may be more subtle and more difficult to identify. For instance, a mussel species may be identified as occurring within a relatively small search radius, when in reality it occurs only in a drainage distinctly separate from the one where the plant is located. Without detailed knowledge of the species and the relevant geographic and ecological context, these cases are difficult to identify within the scope of a broad-scale analysis.

The limitations imposed by large-sized counties is best illustrated by the data for the San Onofre site, which is located on the California coastline. The 100-km (62.5 mile) search radius includes the extreme Southwest corner of San Bernadino County (all within suburban Los Angeles). Because a portion of the county was in the search radius, all species for San Bernadino County are included in the output data. Since San Bernadino County extends from Los Angeles to the Arizona and Nevada borders, many of the species identified by GEN&SIS actually occur over 300 km (200 miles) from the plant site, within a significantly different ecological context.

## **2.2 Licensee Endangered Species Protection Programs**

Very little information was found concerning policies or procedures used by the licensees for the protection or conservation of species protected under the ESA. EPPs or Appendix B of the operating license's technical specifications were obtained for about 20% of the sites. In all cases, the only specific mention of endangered species management is in Section 4.1, "Unusual or Important Environmental Events", wherein the licensee is required to report to NRC within 24 hours "... mortality or unusual occurrence of any species protected by the Endangered Species Act of 1973, ...". Other unusual environmental events that also require notification within 24 hours include significant fish kills, excessive bird collisions, and plant or animal disease outbreaks. All of the facilities have other nonradiological and radiological environmental monitoring requirements that may be useful during detailed assessments of potential impacts to threatened or endangered species.

The USFWS did point out several cases that they were aware of where a site had an active program for the conservation of ecological resources, including threatened or endangered species:

- The Baltimore Gas and Electric Company has worked with The Nature Conservancy and the Maryland Natural Heritage Program to develop a formal management plan that allows The Nature Conservancy to monitor and manage tiger beetle habitat on the Calvert Cliffs plant site.

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- A representative from the Ventura, California, USFWS field office indicated during an informal telephone conversation that she knew that the Diablo Canyon Site has an active biological studies and education program. She knew that because she had worked there as a student.
- The plants in South Florida (St. Lucie and Turkey Point) have monitored threatened or endangered species that are known to inhabit the plant sites. These include American crocodiles at Turkey Point and sea turtles at St. Lucie. We understand that St. Lucie has an active public education program.
- The workers at Salem have become well practiced in reporting and consultation requirements due to numerous impingements of shortnose sturgeon and sea turtles during the 1980s and 1990s, and have procedures in place to deal with this issue.

### **2.3 Critical Habitats**

Very few of the sites or associated transmission lines were determined to be located near designated critical habitats for endangered or threatened species. Those that do include

- Critical Habitat for the Cape Fear shiner near the Shearon-Harris Plant
- State (not federal) designated habitat for bald eagle near the Maine Yankee Site
- Critical Habitat for the desert pupfish, razorback sucker, Mexican spotted owl, and south-western willow flycatcher may occur near the Palo Verde Site or associated transmission lines
- Critical Habitat for the right whale in Cape Cod Bay near the Pilgrim Site
- Proposed Critical Habitat for the Louisiana black bear near the River Bend site
- Critical Habitat for the whooping crane near the South Texas site
- Critical Habitats for the West Indian manatee and Everglade snail kite near the St. Lucie Site
- Critical Habitat for the northern spotted owl in the vicinity of the Trojan site
- Critical Habitats for the American crocodile, West Indian manatee, Cape Sable seaside sparrow, and Everglade snail kite near the Turkey Point site.

### **2.4 Previous Consultations and/or Interactions with USFWS or NMFS**

No records of previous interactions with either the USFWS or NMFS were located for 37 of the 75 sites. The level of interaction for most of the remaining sites is limited to information requests and subsequent responses by the resource agencies. A summary of the interactions and the species identified and/or considered is provided in Table 3. In some cases the USFWS indicated in the 1996 response letters that previous site evaluations had been performed. In general, they did not provide copies of those interactions nor were records of those interactions identified via NUDOCs.

### **2.5 Incidental Take Permits**

Incidental take permits (or statements) have not been issued for most of the plants. Sites that have had incidental take permits issued include

- Hope Creek - NMFS indicated that one was issued, but no record was found in NUDOCs. This take statement was probably related to the take statement prepared for the Salem Plant.
- Maine Yankee - NMFS probably prepared a take statement as a result of several shortnose sturgeon impingements in the early 1980s. Records of such were not located.

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- Oyster Creek - An incidental take statement was prepared by NMFS as part of a 1995 biological opinion concerning the take of Sea Turtles. We have not found or examined this biological opinion and, therefore, the details are not known.
- Salem - Biological opinion prepared by NMFS in 1993 included an incidental take statement that allows the take of 10 shortnose sturgeon, 30 loggerhead turtles (5 mortalities), 5 Green sea turtles (2 mortalities), and 5 Kemp's ridley sea turtles (1 mortality). This incidental take statement was an update of previous take statements prepared for this site.
- St. Lucie - Consultation with NMFS concerning sea turtles occurred in 1995 and 1996. The results of this consultation were not examined because details were not found via NUDOCs or other sources, but an incidental take statement is probably in place or forthcoming.
- Watts Bar - An incidental take permit was included in the USFWS biological opinion. The take of bald eagles is not allowed, but incidental take of one individual of the gray bat, snail darter, or 4 mussel species is allowed.

Table 3. History of Agency Interactions

Site	Species Considered	History
Arkansas		No information found
Arnold		No information found
Beaver Valley	Kirtland's warbler peregrine falcon pink mucket pearlymussel orange-foot pimpleback pearlymussel rough pigtoe (mussel) Indiana bat small whorled pogonia	Information Request Response 6/30/83  Response indicated that adverse impacts were unlikely
Big Rock Point	Letter not found or examined	Information Request Response for decommissioning 7/6/95
Braidwood	bald eagle Indiana bat	Information Request Response 5/3/83
Browns Ferry		No information found
Brunswick		No information found
Byron		No information found
Callaway	peregrine falcon bald eagle pink mucket pearlymussel	Information Request Response 11/25/80 (Not found or examined) USFWS indicated that they requested a Biological Assessment
Catawba	Response not found or examined	Information Request Response 9/1/81
Comanche Peak	No Species	Information Request Response 11/14/80 No T / E species would be affected
Cook		No information found
Cooper		No information found
Crystal River		No information found

Table 3. History of Agency Interactions - Continued

Site	Species Considered	History
Davis-Besse		No information found
Diablo Canyon	peregrine falcon brown pelican least tern southern sea otter	Information Request Response 10/23/79 Biological Opinion - USFWS - 6/19/80 Not likely to adversely affect these four species
	gray whale loggerhead sea turtle green sea turtle hawksbill sea turtle olive ridley sea turtle	Opinion from NMFS that these species were not likely to be adversely affected 1/2/80
Dresden	bald eagle lakeside daisy eastern prairie fringed orchid	Information Request Response 9/15/83 Indicated that adverse impacts were unlikely
Farley		No information found
Fermi	No Species	Information Request Response 3/24/81 No T / E species would be affected
Fitzpatrick		No information found
Fort Calhoun		No information found
Fort St. Vrain		No information found
Ginna	No Species	Information Request Response 9/28/82 No T / E species would be affected
Grand Gulf	red-cockaded woodpecker bayou darter	Information Request Response 2/1/80 Biological Assessment 6/24/81 USFWS Concurrence 7/30/81
Haddam Neck		No information found
Harris	bald eagle red-cockaded woodpecker harperella (plant) Michaux's sumac Carolina trillium	Information Request Response 5/7/82 Further assessments recommended - not known if they were performed
Hatch		No information found
Hope Creek	shortnose sturgeon loggerhead sea turtle hawksbill sea turtle Kemp's ridley sea turtle	Biological Opinion - NMFS - 1980 - No jeopardy conclusion Latest Salem Biological Opinion - 5/14/93 - also may be pertinent
Indian Point		No information found
Kewaunee		No information found
LaCrosse	bald eagle Higgin's' eye pearlymussel	Information Request Response 1/24/80 Indicated that adverse impacts were unlikely
LaSalle		No information found

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Table 3. History of Agency Interactions - Continued		
Site	Species Considered	History
Limerick	shortnose sturgeon	Information Response Request 6/9/82 Biological Assessment 9/20/82 Conclusion 3/8/83
Maine Yankee	shortnose sturgeon	Some level of consultation with NMFS - 8/29/94 - Records not examined
McGuire		No information found
Millstone	small whorled pogonia	Information Request Response 3/10/83 Informal Consultation in 1994 - Records not examined
Monticello		No information found
Nine Mile Point		No information found
North Anna		No information found
Oconee		No information found
Oyster Creek	loggerhead sea turtle green sea turtle Kemp's ridley sea turtle	USFWS - No species affected 2/7/84 NMFS Biological Opinion - Take Statement - 1995 (Not examined)
Palisades		No information found
Palo Verde		No information found
Peach Bottom		No information found
Perry	Indiana bat	Letter from Ohio DNR 7/9/81 Indicates that the species should be considered present
Pilgrim	Records not found nor examined	Informal Consultation in 1994
Point Beach		No information found
Prairie Island		No information found
Quad-Cities		No information found
Rancho Seco		No information found
River Bend	red-cockaded woodpecker	Information Request Response 6/15/83 Requested additional assessment
Robinson	red-cockaded woodpecker	Licensee indicated presence on site 8/3/83
Salem	shortnose sturgeon loggerhead sea turtle hawksbill sea turtle Kemp's ridley sea turtle	Updated Biological Opinion and Take Statement 5/14/93
San Onofre	green sea turtle  Other Species?	Green Turtle Biological Assessment 9/16/91 Informal Consultation - 11/94 (Records not examined)
Seabrook	peregrine falcon bald eagle small whorled pogonia shortnose sturgeon leatherback sea turtle	Terrestrial Information Response - 10/27/81 Aquatic Information Response - 2/25/82 Adverse affects unlikely

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Table 3. History of Agency Interactions - Continued		
Site	Species Considered	History
Sequoyah		No information found
Shoreham		No information found
South Texas	whooping crane bald eagle brown pelican Attwater's prairie-chicken jaguarundi	Information Request Response 5/30/85 Indicated adverse impacts were unlikely
St. Lucie	bald eagle West Indian manatee loggerhead sea turtle green sea turtle leatherback sea turtle Kemp's ridley sea turtle	Biological Opinion - 3/82  New Sea Turtle Biological Assessment 2/96
Summer		No information found
Surry		No information found
Susquehanna		No information found
Three Mile Island		No information found
Trojan	Aleutian Canada goose peregrine falcon bald eagle sockeye salmon chinook salmon Columbian white-tailed deer water howellia Bradshaw's desert-parsley	Information Request Response 7/12/95
Turkey Point	peregrine falcon bald eagle West Indian manatee eastern indigo snake American crocodile loggerhead sea turtle green sea turtle leatherback sea turtle hawksbill sea turtle Kemp's ridley sea turtle	Information Request Response 7/25/80 Biological Assessment 12/12/80 Biological Opinion 1/15/81
Vermont Yankee		No information found

Table 3. History of Agency Interactions - Continued			
Site	Species Considered	History	
Vogtle	bald eagle	Information Request Response	7/11/84
	wood stork	Biological Assessment	9/14/84
	red-cockaded woodpecker	NMFS Opinion for Sturgeon	7/24/85
	shortnose sturgeon		
Waterford	Response not found or examined	Information Request Response	1/15/80
Watts Bar	bald eagle	Biological Assessment	10/28/94
	gray bat		
	snail darter		
	fanshell	USFWS Biological Opinion	3/8/95
	dromedary pearlymussel		
	pink mucket pearlymussel		
	rough pigtoe		
WNP-2	bald eagle	Information Request Response	2/29/80
Wolf Creek	peregrine falcon	Information Request Response	5/29/81
	bald eagle		
Yankee Rowe		No information found	
Zion		No information found	

## 2.6 Species Potentially Occurring Near Plant Sites or Transmission Lines

Approximately 484 species (or sub-species / varieties) that are listed by the USFWS or NMFS as endangered, threatened, proposed, or candidate were identified as potentially occurring in the vicinity of one or more of the 75 power plants or associated transmission lines (see Appendix B). In addition to these, approximately 353 species listed as "former candidates" or "species of concern" were identified. Of the 837 species identified, 15 species (Table 4) potentially occur at 20% or more of the sites (> 15 sites), an additional 34 species potentially occur at more than 10% of the sites (8 to 14 sites), and an additional 82 species potentially occur at more than 5% of the sites (4 to 7 sites). Seven hundred and six species potentially occur at less than 5% of the sites, including 448 that potentially occur at only one site each. The median number of species per site is 21, and the mean is about 30 species per site. The species potentially occurring at each site are provided in Appendix E.



Table 4. Species Most Commonly Identified as Potentially Occurring Near Facility Sites or Transmission Lines

Common Name	Status	# of Sites
bald eagle	T	75
peregrine falcon	E	66
Indiana bat	E	47
piping plover	E,T	43
small whorled pogonia	T	29
shortnose sturgeon	E	29
loggerhead sea turtle	T	27
red-cockaded woodpecker	E	23
eastern cougar	E	23
Kemp's ridley sea turtle	E	22
green sea turtle	E,T	21
loggerhead shrike	SC	19
hawksbill sea turtle	E	18
Karner blue butterfly	E	17
eastern prairie fringed orchid	T	17

The bald eagle and peregrine falcon (including both *Falco peregrinus anatum* and *F.p. tundrius*) potentially occur at virtually all of the sites. In many cases, these species may simply be transient individuals, but in other cases these birds are using the areas around the plant sites or transmission lines. This is especially true for the bald eagle, which is known to nest near several sites (Maine Yankee, Wolf Creek, and sites in Minnesota among others), and potentially nests near several others (such as those in Wisconsin). Eagles use the areas near many sites for winter foraging.

The Indiana bat potentially occurs at a large number of sites, but this is probably more a reflection of its historic range than a high probability of actual occurrence. This is almost certainly true for the eastern cougar, which is presumed to be extinct in the wild. Most of the potential occurrences of the Indiana bat and eastern cougar were identified via the GEN&SIS program. The distribution of other frequently identified species includes the following:

- The piping plover was found to potentially occur at all sites near the Atlantic shoreline and near the Great Lakes, as well as along several mid-western rivers.
- The shortnose sturgeon potentially occurs near any nuclear facility in the eastern United States that is located on a larger river feeding directly to the Atlantic Ocean, or on the shoreline of an Atlantic seaboard estuary.
- All of the sea turtles potentially occur at any site located on or very near an ocean or estuary. The number of sites associated with these species is somewhat misleading because in some cases sea turtles were identified by the GEN&SIS program as occurring near some of the inland plants, such as Limerick and Peach Bottom, when a coastal county occurred within the search radius.

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- The small-whorled pogonia potentially occurs near all sites in New England, south to the Carolinas, and west to Michigan and Tennessee.
- The red-cockaded woodpecker potentially occurs at all sites in the Southeastern United States from Virginia to Texas and Arkansas.
- The Karner blue butterfly potentially occurs at sites in the upper mid-west from Ohio to Minnesota, but was also identified as potentially occurring near several sites in New England.
- The eastern prairie fringed orchid potentially occurs at sites in the upper mid-west, east of the Mississippi river. Its cousin, the western prairie fringed orchid, potentially occurs at 9 sites, primarily west of the Mississippi River (but both were identified as potentially occurring near Quad Cities, Arnold, and Byron).
- The loggerhead shrike (including both *Lanius ludovicianus* and *L. l. migrans* since the FESs usually were not specific) potentially occurs at sites throughout all parts of the United States except New England and the extreme southeast.

The sites with the largest number of potential species occurrences were San Onofre (131 species) and Diablo Canyon (127 species). These high numbers are primarily due to the fact that California has by far the largest number of listed, proposed, candidate and former candidates (nearly 1400; the next closest is Texas with about 450). The large numbers also are partially due to the way that GEN&SIS identifies potential species occurrences, as explained earlier. Other sites with a large number of species include South Texas (88), Sequoyah (72), Watts Bar (71), and Vogtle (67). The sites with the fewest number of potential species were Fort St. Vrain (6), Maine Yankee (7), Clinton (7), Susquehanna (8), and Fitzpatrick /Nine-Mile Point (9).

### **2.7 Changes in Candidate Species Classifications by the USFWS**

On February 28, 1996, the USFWS announced a major change in the way that candidate species are recognized and classified (61 FR 7595-7611). Under previous Notices of Review candidate species were grouped into 3 categories. Category 1 (C1) included species for which sufficient information was available to warrant a listing proposal, but such listing proposals were precluded because limited time and fiscal resources needed to be directed to other higher-priority species. Category 2 (C2) included species for which the USFWS had sufficient information that the species may be in danger, but not enough information to warrant a listing proposal. Category 3 included species that were no longer considered candidates for listing because they were believed to be extinct (C3a), the taxa did not meet the USFWS definition of "species" (C3b), or because the available information indicated that the existing populations were large enough and/or not under any identifiable threats so that a listing proposal was not warranted (C3c).

With the 1996 Notice of Review, the only species considered to be candidates for listing are most of those that were formerly classified as Category 1 candidates. Species in the other two candidate categories are no longer considered candidates for listing under the ESA, and have been assigned to a nebulous group called "species of concern." The species of concern group is considered the pool from which future candidate species will be identified. In addition to the species previously in Category 2, a number of species previously classified as Category 1 were removed from the list of candidate species. These changes resulted in a reduction of the number of candidate species from several thousand to 183.

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The USFWS made this change in definitions to reduce confusion concerning the conservation status of the Category 2 candidate species. However, the USFWS does state in the current notice that they remain concerned about the former C2 species, and that they are working with the states and other public and private interests to assess their need for protection under the ESA. Therefore, it would be prudent to continue to track the potential occurrences of former C2 species near licensed nuclear power plants, and to consider the potential effects of facility operations on these species, since it is possible that those species will be considered for formal listing in the future.

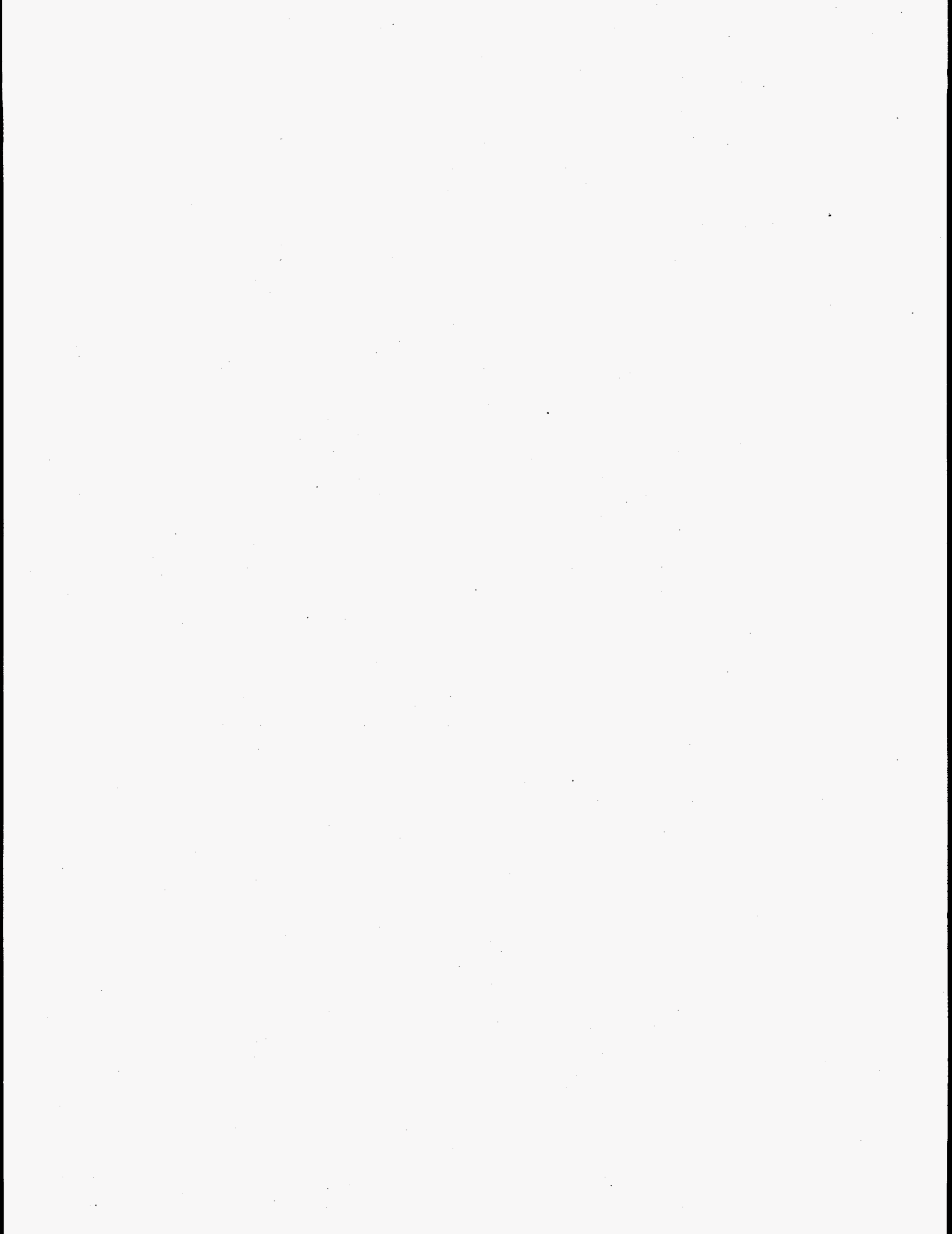
The database constructed to identify the current status of each species was developed prior to the change in USFWS policy and initially included all candidate species (both C1 and C2). This database now includes all of the most current status information. Species previously identified as Candidate 2 (C2) are now identified in the database as species of concern (SC), species previously listed as Candidate 1 (C1) are now simply "Candidate" (C). Species previously classed as C3 are not included in the database.

The change in candidate definitions simplifies and helps to standardize the evaluation of which rare species are in the vicinity of each licensed nuclear power plant. The change in definition has made the designation of "candidate" more meaningful, in that it can be assumed that a candidate species will be addressed in a listing proposal at some point in the foreseeable future. This was not the case under the former system, in which some species were on the candidate list for nearly 20 years. Therefore, in the evaluations performed under this project scope, the candidates are considered equally with the listed and proposed endangered and threatened species. This would have been less appropriate under the previous system, especially because the available information concerning the potential presence of the former C2 species varied greatly among sites.

### **2.8 Compilation of Database**

The information collected in this study has been entered into an electronic database that allows for sorting and viewing the information in many different ways. The software package selected is FileMaker Pro (Trademark of Claris Corporation) which is a relatively user-friendly, relational database that runs under both *MacIntosh* (Trademark of Apple Computer Corporation) and *Windows 95* (Trademark of Microsoft Corporation) desktop computer operating systems.

Information in the database includes listings of species identified as potentially occurring in the vicinity of the plant site or transmission lines; the source of this information (i.e., the FES, previous consultations, the GEN&SIS program, or in the USFWS or NMFS information request responses); critical habitats in the vicinity of the facilities or transmission lines; general land-use in the vicinity of the power plants; consultation histories; other information from NUDOCs; and general information about each facility such as location, licensed power levels, docket numbers, licensees, length of transmission lines, type of cooling system, water source, and descriptions of intake and discharge structures. Information concerning listing status and state-level distributions of all threatened, endangered, proposed, candidate and former candidate species was down-loaded via the Internet directly from USFWS file servers and has been continually updated with information concerning the listing status of individual species as published in the Federal Register.



### 3.0 SITE RANKINGS AND INITIAL PRIORITIZATION

A ranking system was developed to combine the available information for each site and create a method for comparing all sites using a set of standardized criteria. Information used in this ranking methodology includes the total number of species identified as potentially occurring in the site vicinity, the source of that information, an assessment of which species are highly likely to be affected by the power plant or transmission lines, species that are currently monitored or managed at a site, critical habitats that may be affected by power plant or transmission line operations, the size of the facility, the type of cooling system used, and the length of transmission lines associated with the site.

This initial ranking system was designed as an attempt to quantify the uncertainties concerning impacts to threatened and endangered species at each licensed facility, and to identify an initial list of priorities for follow-up actions. The ranking system described here provides a means to assess numerous types of information simultaneously, and to compare uncertainties among sites. The results of this ranking are an important component of the final site prioritization that is described in Section 4.3, but are not the sole basis for the final prioritization.

There are several important factors that were not included in the initial ranking system. These include the quality and/or quantity of biological information available for each site, and the activity status of the sites. Seven of the sites considered have facilities that have been or are being decommissioned. Because these facilities are not operating, there probably are fewer aquatic impacts because of decreased cooling water requirements, and possibly fewer or no terrestrial impacts. This important factor was not included, so there are some sites that rank highly under this system when in fact they are not operating. This factor was considered during the final prioritization process. Site-specific technical and engineering details, such as the intake structure configuration, also are not included in this initial ranking system but were considered during the final prioritization process.

The system was developed interactively, and various combinations of the factors included were examined and tested. The final ranking system is one of many possible combinations of factors, and many other legitimate systems are possible. The combination of factors was selected so that sites would be ranked higher (higher priority) if

- there are many threatened or endangered species that are likely to be near the power plant or transmission lines
- few or none of these species are being actively monitored by the licensee
- there are designated critical habitats near the power plant or transmission lines
- the site has a high potential for ecological impact either through large water-use requirements or long transmission lines
- the habitat immediately affected is relatively sensitive such as a small river compared to a large artificial reservoir.

Potential aquatic and terrestrial impacts were considered separately under this ranking system. This is because in many cases the potential impacts of a facility on these two portions of the whole ecosystem may be uncorrelated. For instance, a plant could be located on a small river that is rich in aquatic threatened and endangered species and have large water-use requirements, but virtually no transmission lines under NRC licensing purview. In that case, the potential for adverse impacts to rare aquatic species may be substantial, but the potential for adverse impacts to rare terrestrial species may be negligible.

Sites were assigned subscores both for the species potentially affected by plant or transmission line operations and for the level of ecological impact attributable to the site. This process was performed separately for the aquatic and terrestrial components, therefore each site has an aquatic species subscore, a terrestrial species subscore, an aquatic impact subscore, and a terrestrial impact subscore. Final scores for aquatic and terrestrial effects were calculated separately as

$$\text{Aquatic or Terrestrial Score} = (\text{species subscore}) * (\text{ecological impact subscore})$$

The sites were then ranked from 1 to 75 based on each final score, with a rank of 1 assigned to the site with the greatest potential impact and a rank of 75 assigned to the site with the lowest potential impact based on this ranking system. These ranks were then used as part of the overall evaluation and priority assignment for each site, but were not the sole basis for final priority determination. The utility of the rankings is that all of the sites can be compared based on a standardized set of criteria that provide a general overview of potential impacts.

The specific procedures used to combine the data and to compute the species and impact subscores were developed as an attempt to provide a spread in the resulting scores that would allow for a discrimination among sites.

### **3.1 Aquatic Ranking System**

#### **3.1.1 Aquatic Species Evaluation Methodology**

The calculation of the species subscore was designed to give more weight to those species that are highly likely to occur near a particular site. Species that are consistently identified by the various data sources as occurring in an area contribute more to the total species subscore than those species that are identified by only one source.

The 1996 information request responses from USFWS and NMFS were considered to be the best source of species occurrence information, therefore they contribute more than other data sources. The information collected from the FESs, previous interactions between the NRC and USFWS or NMFS, and other data sources is considered the next best source of information. The species lists from the GEN&SIS 32-km (20-mile) run is also considered to be excellent information, but in many cases it is redundant to the data obtained from other sources and, therefore, it does not contribute as much to the total subscore as the 1996 USFWS/NMFS responses or the FES data. Species identified by GEN&SIS as only occurring beyond a range of 32 km (20 miles) are the least likely to actually be present at a particular site, therefore the GEN&SIS 100-km (62.5-mile) run contributes the least to the total species subscore.

Species for which there is substantial documentation of occurrence at or very near a plant site contribute much more to the total species subscore than species that can, at best, be considered potentially occurring. A species is considered a "known" species if there have been known takes at a site, it is clearly indicated in the FES or other documentation that it is present at a site, or if the USFWS / NMFS clearly indicated that it occurs within 10 miles of the site. Species that are known to occur at a site but are currently "managed" do not count as "known" species. Managed species include cases where there have been known occurrences (including takes), subsequent consultations with appropriate agencies have been conducted, and management and/or monitoring procedures are in place. The overall intent is to identify those sites with a significant number of known species that are not being managed or monitored. Sites that are

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managing one or more species are considered to be in compliance with the ESA with regard to those species.

The presence of critical habitats in the vicinity of a site is considered to be important, and therefore contributes significantly to the overall species subscore.

These factors were all considered in the development of the following species weighting system. It should be stressed that this is simply one way of combining the species data, other perfectly legitimate alternatives could be developed. However, any reasonable weighting system should, in general, give the highest scores to sites with the highest number of species potentially present, and the lowest scores to the sites with the fewest species.

$$\text{Aquatic Species Subscore} = 5 * (\# \text{ USFWS}) + 3 * (\# \text{ previous /FES}) + 1 * (\# \text{ GS32K}) + (1/2) * (\# \text{ GS100K}) + 10 * (\# \text{ known} - \# \text{ managed}) + 10 * (\# \text{ critical habitats})$$

Where:

# USFWS = the number of aquatic species identified as potentially occurring in the plant vicinity by USFWS or NMFS in response to the 1996 information request

# previous /FES = the number of aquatic species identified as potentially occurring in the plant vicinity in the FES, previously by USFWS/NMFS, or other sources

# GS32K = the number of aquatic species identified in the GEn&SIS 32-km (20-mile) run

# GS100K = the number of aquatic species identified in the GEn&SIS 100-km (62.5-mile) run that were not identified in the 32-km (20-mile) run

# known = the number of species that are known to exist on site or nearby

# managed = the number of the known aquatic species for which management and or monitoring guidelines are in place

# critical habitats = the number of critical habitats for aquatic organisms in the vicinity of the plant site.

In all cases, the number of species refers to the number of endangered, threatened, proposed, or candidate species, not all species at a site.

For the purposes of this weighting system, all fish, clams, crustaceans, marine mammals, sea turtles, some other reptiles such as crocodiles, and some snails were considered aquatic species. The GEn&SIS lists were edited to remove species that were obviously inaccurate (i.e., sea turtles at inland sites). A species may enter into the calculation multiple times, depending on the number of different sources that identified it as potentially occurring at a site (i.e., a species identified in the FES and the 32-km (20-mile) GEn&SIS run, but not by the USFWS in 1996, would contribute 4 points to the total, and an additional 10 points if it is determined that it qualifies as a "known" species near the site and is not currently managed). Therefore, a single species may contribute as many as 29 points to the total species subscore, or as few as 1/2 point (if identified only in the GEn&SIS 100-km (62.5-mile) run).

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The aquatic species subscores for each site, and the numbers associated with each contributing factor, are listed in Table C.1 of Appendix C. Aquatic Species subscores ranged from 138 at Turkey Point to 0 at 10 different sites.

### **3.1.2 Aquatic Ecological Impact Evaluation Methodology**

The Aquatic Impact is based on both water use and the water source / heat sink for the power plant:

$$\text{Aquatic Impact Subscore} = \text{Water Use} * \text{Water source/sink}$$

Facilities that have higher water-use requirements are more likely to impact rare aquatic species via entrainment, impingement, or thermal discharge effects than plants with low water-use requirements. Water use is estimated based on the total thermal power rating for the site (sum of multiple units if applicable), and the type of cooling system:

$$\text{Water Use} = \text{scaled thermal power} * \text{cooling system type}$$

Thermal power is scaled as

< 2000 MWt	= 1
2000 - 3000	= 2
3000 - 4000	= 3
4000 - 5000	= 4
5000 - 6000	= 5
6000 - 7000	= 6
> 7000 MWt	= 7

Cooling systems are scaled as

Once-through	= 5
Once-through with helper towers	= 4
Closed-cycle cooling towers	= 2
Others (mainly closed-cycle cooling ponds)	= 3

Therefore water use can range from "2" for a small, closed-cycle facility to "35" for a very large, multi-unit site with once-through cooling.

The scale for water sources is based on an evaluation of the ecological effects that a nuclear power generating facility can have on a particular type of water body, and the potential impacts to listed species. Therefore, the Great Lakes are scaled low because a nuclear power generating facility is not likely to have a large ecological effect on a Great Lake and because there are very few listed, proposed, or candidate species that inhabit the Great Lakes. On the other hand, a plant could have a large ecological impact on a small river, and depending on the site, there may be a number of listed species that could be directly affected.

Water sources are scaled as

Great Lakes	= 1
Ocean	= 2
Artificial reservoirs	= 2
"River Reservoirs"	= 2
Big River	= 3
Medium River	= 4
Small River	= 5



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Estuary = 5  
Others = 1 to 3

Therefore aquatic impact subscores can potentially range from "2" for a small, closed-cycle plant on a great lake to "175" for a very large, multi-unit, once-through site on a small river or estuary. The lowest impact subscore was 4 at the Davis-Besse and Palisades facilities and the highest was 150 at Salem. A complete listing of aquatic impact subscores for all sites is provided in Table C.2.

### **3.1.3 Overall Ranking of Sites Based on Aquatic Criteria**

For the purposes of comparing the potential impacts to threatened or endangered aquatic species, the sites were ranked from 1 to 75 (1 being the greatest potential impact) based on each of two overall aquatic scores:

Aquatic Score 1 = Aquatic species subscore \* scaled aquatic impact subscore

Aquatic Score 2 = Aquatic species subscore \* un-scaled aquatic impact subscore

Aquatic impacts are scaled as

0 - 10	= 1
10 - 20	= 2
20 - 40	= 3
40 - 60	= 4
60 - 100	= 5
> 100	= 6

The use of scaled impact subscores (Score 1) tends to rank sites with high species subscores higher than sites with lower species subscores. The use of non-scaled impact subscores (Score 2) tends to rank sites with high impact subscores higher than sites with lower impact subscores. In general the 2 aquatic ranks are highly correlated, and the two ranks for all but 2 of the sites differed by less than 10 places, which is an indication that the weighting of species effects and potential ecological impacts are generally balanced. The two exceptions are Indian Point which ranks 28th on Score 1 and 18th on Score 2 (indicating that the potential effects are driven more by the ecological impact than the number of species affected) and Fort Calhoun which ranks 20th on Score 1 and 31st on Score 2 (indicating that the potential effects are driven by the number of species potentially affected more than the potential ecological impacts).

The overall aquatic scores and ranks for all of the sites are provided in Table C.3. Based on this initial ranking system, the 10 sites with the highest potential for impacts to aquatic threatened or endangered species are Brunswick, Diablo Canyon, Millstone, Turkey Point, San Onofre, South Texas, Salem, Surry, St. Lucie, and Pilgrim. These sites all have relatively large numbers of threatened or endangered aquatic species in the vicinity, and all have relatively high levels of potential ecological impacts. The fact that these sites are highly ranked under this system does not necessarily imply that adverse impacts to threatened or endangered species are actually occurring, nor does it imply that these sites are necessarily considered the highest priority for follow-up actions. These rankings are one of many considerations used to determine future priorities.

There were 10 sites that had Aquatic Scores (both Score 1 and Score 2) of "0" because there was no indication of any threatened, endangered, proposed, or candidate aquatic species in the vicinity of the sites. If there are no such species, adverse impacts to listed species are highly unlikely. The 10 sites with no

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identifiable potential impacts to rare aquatic species are Big Rock Point, Comanche Peak, Dresden, Fitzpatrick, Fort St. Vrain, Ginna, Kewaunee, Nine Mile Point, Point Beach, and Zion. For several other sites, the only threatened or endangered aquatic species near the plant were identified by GEN&SIS in counties more than 32 km (20 miles) from the plant site. Adverse impacts to listed aquatic species at these sites are also highly unlikely.

### **3.2 Terrestrial Ranking System**

#### **3.2.1 Terrestrial Species Evaluation Methodology**

The same assumptions concerning weighting that were made for the aquatic species evaluations were also applied to the terrestrial species evaluation. Therefore, species consistently identified through multiple data sources and those that are definitively known to be in the vicinity of the plant site or associated transmission lines contribute more to the total species subscore than species identified through fewer data sources, or those for which there is no definitive occurrence information. The formula used for the terrestrial species subscore is also the same as that used for the aquatic species subscore.

$$\text{Terrestrial Species Subscore} = 5 * (\# \text{ USFWS}) + 3 * (\# \text{ previous /FES}) + 1 * (\# \text{ GS32K}) + (1/2) * (\# \text{ GS100K}) + 10 * (\# \text{ known} - \# \text{ managed}) + 10 * (\# \text{ critical habitats})$$

Where:

# USFWS = the number of terrestrial species identified by USFWS as potentially occurring near the plant or transmission lines in response to the 1996 information request

# previous /FES = the number of terrestrial species identified in the FES, previously by USFWS, or via other sources as potentially being near the plant or transmission lines.

# GS32K = the number of terrestrial species identified in the GEN&SIS 32-km (20-mile) run

# GS100K = the number of terrestrial species identified in the GEN&SIS 100-km (62.5-mile) run not identified in the 32-km (20-mile) run

# known = the number of terrestrial species that are known to exist on or near the plant site or transmission lines

# managed = the number of the known terrestrial species for which management or monitoring guidelines are in place

# critical habitats = the number of critical habitats for terrestrial species in the vicinity of the plant or transmission lines

For the purposes of this weighting system all birds and plants, and most mammals, reptiles, amphibians, insects, and arachnids are considered terrestrial species.

The terrestrial species subscores for each site, and the numbers associated with each contributing factor, are listed in Table C.4. Terrestrial species subscores ranged from 417.5 at Diablo Canyon to 8.5 at Indian Point.

### **3.2.2 Terrestrial Ecological Impact Evaluation Methodology**

It is assumed that the potential terrestrial ecological impacts at the plant sites themselves are independent of plant size, thermal power, etc. Thus terrestrial ecological impacts at the plant site are assumed to be equivalent at all of the sites for the purposes of this evaluation. The primary terrestrial ecological impacts would result from the operation and maintenance of the transmission lines and corridors. Therefore, the terrestrial ecological impact used in this ranking system is the length of the transmission lines in miles, because the likelihood of adverse impacts to rare species would be proportional to the amount of transmission line corridor associated with a facility. A site with short transmission lines has a lower probability of adversely impacting a listed species than a site with long transmission lines.

Transmission line lengths ranged from 585 miles at Palo Verde to less than 1 mile at several sites. The total length of transmission lines associated with each site is provided in Table C.5.

### **3.2.3 Overall Ranking of Sites Based on Terrestrial Criteria**

The overall terrestrial scores are calculated either using the transmission line length directly or as a scaled value of the length of transmission lines:

Transmission Line length is scaled as

0 -10 miles = 1
10 - 50 miles = 2
50 - 100 miles = 3
100 - 300 miles = 4
> 300 miles = 5

Terrestrial Score 1 = Terrestrial species subscore \* scaled transmission line length

Terrestrial Score 2 = Terrestrial species subscore \* unscaled transmission line length

As with the aquatic impact evaluation, the use of scaled values (Score 1) tends to give higher ranks to sites with high species subscores, whereas the use of un-scaled values (Score 2) tends to increase the ranks of sites with longer transmission lines. The 2 terrestrial scores are correlated, but they are less correlated than the comparable aquatic scores. The two ranks of four sites differed by more than 20 rank places, and several more differed by more than 10 places. The sites with the largest rank differences are Arkansas which ranked 57th on Score 1 and 28th on Score 2 (indicating a relatively low species subscore, but a relatively high potential impact) and three sites with rank changes that indicate that the species subscores are high, but that have relatively short transmission lines (Comanche Peak [28th and 56th on Scores 1 and 2 respectively], Oyster Creek [27th and 61st respectively], and St. Lucie [8th and 34th respectively]). The overall terrestrial impact scores and associated rankings for each site are listed in Table C.5.

When both of the scores are considered, the 10 sites with the greatest potential for adverse impacts to threatened or endangered species are Palo Verde, Diablo Canyon, South Texas, Vogtle, Oconee, San Onofre, Brunswick, Hatch, Hope Creek, and Salem. All of these sites have a relatively large number of threatened or endangered species potentially affected at the plant site or along the transmission lines, and all have relatively long transmission line corridors. As with the aquatic rankings, the fact that these sites are highly ranked under this system does not necessarily imply that adverse impacts to threatened or endangered species are actually occurring, nor does it imply that these sites are always the highest priority for follow-up actions. These rankings are one of many considerations used to determine future priorities.

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A number of sites consistently had low ranks, indicating that there are relatively few species potentially impacted, and that the transmission lines are relatively short, meaning that the potential ecological impacts are low. Four sites were ranked in the bottom 5 for both Score 1 and Score 2 (Ginna, Big Rock Point, Shoreham, and Indian Point). An additional 12 sites had average ranks between 60 and 70. Low rankings do not necessarily imply that there are no potential impacts to terrestrial species at these sites nor are these sites always considered low priority for follow-up action. It is possible that one or two species are clearly affected by the operation of the plant or the maintenance of the transmission lines, but the site could still receive a low ranking if the total number of species is low and the transmission lines are relatively short. The rankings are primarily influenced by the total number of species near a site; therefore, if there are very few species, the overall ranking is probably low, even if those species that are present are directly affected by the facility or transmission lines. Facility-specific factors such as this are considered during the final prioritization process.

## **4.0 FINDINGS AND PRIORITIES FOR FUTURE ACTION**

### **4.1 Decision Process**

Many factors were considered to determine the potential for significant ESA issues at each site, and to assess the priority of each site for further, more detailed evaluations. These factors include

- the results of the ranking system described in Section 3.0
- the number and types of threatened, endangered, proposed, or candidate species known to occur or potentially occurring near the site
- the potential effects of power plant operation and transmission line operation and maintenance on each of the species potentially affected by the power plant or transmission lines
- facility-specific information such as thermal output, cooling system, water source, intake structure locations and configuration, and length and location of transmission lines
- specific issues raised by the USFWS or NMFS in their 1996 information request responses
- results of previous interactions with the USFWS and/or NMFS
- known actions taken by licensees to manage or mitigate known or potential adverse impacts to threatened or endangered species
- the quality and/or quantity of biological information available for the site.

The number of species in the vicinity of a power plant is important because, based purely on probability, a facility with many rare species nearby is more likely to have an adverse affect on at least one of those species than a facility with few or no rare species in the area. However, the gross number of species must be modified by the range in types of rare species. For instance, there are 5 species of sea turtles potentially occurring at many of the sites located on estuaries or ocean shores on the east coast. While each of these species are slightly different in terms of what they eat, where they breed, swimming velocity, etc., the potential effects of a nuclear power generating facility on each of these species are probably very similar. Therefore, the potential for adverse impacts to sea turtles is probably much more dependent on the total population density of all sea turtles than whether there are one, two, or all five species at any particular site.

The potential effects of power plant operation or transmission line maintenance on all species that may be in an area are difficult to assess without a considerable amount of site- and species-specific information. However, in some cases general assumptions may be drawn. For example, peregrine falcons are potentially present in the vicinity of nearly all of the sites. While there is a potential that individuals could be adversely affected by noise or human activity, especially near nesting sites, there are many instances where falcons are known to be nesting on buildings, bridge spans, and other structures within areas heavily used by humans. This indicates that at least some populations of falcons would be undeterred by the human presence associated with power plant operations or transmission line maintenance. Furthermore, falcons feed primarily on passerine birds, for which the net effect of transmission line presence and maintenance is

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probably neutral (i.e., on the overall prey base, not necessarily for each individual passerine species). Therefore, except for the potential of electrocutions, peregrine falcons, in general, are probably not significantly effected by transmission lines. Electrocution is a generic issue associated with all of the nuclear power plants.

In some cases several species may be grouped for impact evaluation purposes. One example is rare plant species along transmission corridors. They may have vastly different habitat requirements, but all could be affected in similar ways by pesticides, cutting, trampling, or other activities associated with transmission line maintenance. In this case the potential impact is evaluated in terms of both the total number of rare plant species potentially present along the corridors, and the total length of the transmission lines. The more species, the more likely that at least one of their habitats will be affected, and the longer the lines the more likely that one or more populations will occur in or near the corridors. A similar situation occurs in the Tennessee River system, where there could be 20 species of threatened or endangered mussel species near a particular location. Each of these species undoubtedly has specific requirements such as water depth, thermal range, and water velocity, but at the level of assessment possible in this evaluation the potential effects of a nuclear power generating facility on each of these is considered to be similar, and the overall potential for adverse impacts is correlated to the number of species.

There are a few cases where assumptions regarding impacts to particular species can be drawn from the operational history of a facility. For example, the shortnose sturgeon is likely to inhabit the Hudson River near the Indian Point Site. The Indian Point reactors are relatively large, and utilize a once-through cooling system, which would suggest that sturgeons may be subject to impingement or other effects. However, the reactors have been operating since the 1970s with no record of sturgeon impingements and, therefore, it can be assumed that the potential for direct impact is small.

Facility-specific information such as water intake requirements, intake configuration, and transmission line length can greatly influence the potential for adverse impacts to threatened or endangered species. Facilities with closed-cycle cooling systems have much smaller effects (physical, thermal, radiological, and chemical) on the water body that serves as the water source and/or heat sink than plants of the same thermal power rating that utilize a once-through cooling system. For example, the Salem site has had an ongoing problem with impingement of sea turtles and shortnose sturgeon and uses a once-through system to cool two reactor units. The Hope Creek site is immediately adjacent to Salem, but uses a closed-cycle system to cool a single unit, and has had no problems with sea turtles or sturgeons.

The configuration of the intake and discharge systems also can greatly influence the magnitude of potential impacts. Facilities with once-through cooling systems that receive cooling water from a long, low velocity canal are less likely to cause direct mortality to aquatic species than if the same facility received water directly from a shoreline structure at higher velocity.

The results of previous interactions with the USFWS and NMFS help to indicate what species are most likely to be in an area, and which species have not been previously considered. In some cases this information provides a basis for determining if potential impacts are significant. In other cases the interactions with USFWS or NMFS resulted in management actions and procedures that have brought the site into full compliance with the ESA for those species considered in the interactions. For instance, American crocodiles and manatees have been carefully evaluated at the Turkey Point site, and they are currently monitored and managed. Therefore, at this time, these particular species are considered to be less important in the overall evaluation of the site than other species potentially in the area, even though they inhabit the cooling water canal system.



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The quality and quantity of biological information available for each site enters into the evaluation, but not in a direct or consistent manner. Sites for which there is considerable information available are easier to classify into priority levels than sites for which little information is available. A high-priority assignment to a site that has many species in the area and high potential impact is strengthened if it is based on a large amount of data, but it also may be strengthened if there is little available information. Conversely, a low-priority assignment is strengthened if it is based on a large amount of data, but could be weakened if there is less information available.

The ranking system described in Section 3.0 was developed as an attempt to integrate as many of these considerations into a standardized method for comparing the potential impacts to threatened and endangered species across all of the sites. This system is most useful for identifying those sites with either the highest or lowest potential for adverse impacts. However, there are cases of sites that are highly ranked being assigned low priority for further action, and there are cases of sites that were ranked near the bottom that were assigned high priority because of factors that were not or could not be included in the ranking system, such as specific intake structure configurations, operational history, or the actual proximity of critical habitats.

### **4.2 Generic Issues**

Several issues were identified that are pertinent to most or all of the licensed commercial nuclear power plants. These include bald eagles, the electrocution of large birds on transmission lines, and the routing and maintenance of transmission lines.

#### **4.2.1 Bald Eagles**

Bald eagles (*Haliaeetus leucocephalus*) were identified as potentially occurring in the vicinity of all 75 licensed nuclear power generating facility sites. At many of the sites bald eagles are only present as occasional transients in the area. For a significant number of sites, bald eagles use areas in the near vicinity as winter feeding areas, and at several sites they are known to breed. Because this species potentially occurs near all of the sites considered, it may be appropriate to consider the potential impact of nuclear power generating facilities on this species from a generic standpoint. In general, the presence of eagles in the vicinity of a plant site is not considered to be a potential ESA-related issue within this evaluation.

When eagles are occasional transients, the presence of a nuclear power generating facility probably has little or no effect on the eagles, except for the potential for electrocution along the transmission lines. However, if the eagles are resident in the vicinity of a site for at least part of the year, they could be subject to both direct and indirect effects.

Direct effects include electrocution on transmission lines; destruction of perching, roosting, and nesting trees; and habitat avoidance or nest abandonment due to noise from human activity or presence. The subject of electrocution is discussed in the Section 4.2.2.

The scope of the evaluation conducted within this report is limited to existing facilities and transmission lines. Therefore, the loss of perching, roosting, or nesting trees is not expected to result from normal plant operations or from operation and maintenance of existing transmission lines and, thus, this potential impact is not considered to be significant at any of the power plant sites. If any new transmission lines are

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proposed for a facility that has wintering or nesting eagles nearby, a careful evaluation should be performed to ensure that eagle perching, roosting, or nesting sites are not disturbed.

The avoidance of suitable habitat or even the abandonment of nests because of noise and/or nearby human activity is possible at a number of sites. This may be especially true during transmission line maintenance if the lines are located in isolated areas where the eagles do not routinely encounter humans. However, for most sites this is not predicted to be a significant adverse impact because, except where the transmission lines cross rivers or streams, the probability is low that the lines occur near enough to heavily used areas (i.e., within 1 km [0.5 mile]) that maintenance would cause avoidance or nest abandonment. Additionally, occasional noise or human activity usually does not cause permanent avoidance of an area or nest abandonment. In many cases, eagles are known to winter or even nest very near the site of the nuclear power plant. In these cases, it is assumed that the individuals or populations are acclimated to the normal level of human presence in the area and that direct impacts are minimal.

One additional potential direct impact occasionally may occur at power plants located in areas where the body of water used for cooling freezes during the winter. When the rest of the river or lake is frozen, eagles may use the portion that is kept warmer by the heated effluent. The eagles may lose foraging areas if the plant is shut down during these periods.

Bald eagles may be indirectly affected by the operation of a nuclear generating facility if the operation of the facility causes a change or decline in food supply, or if materials released to the water or air bioaccumulate in the eagles and cause physiological or behavior changes. The analysis of these types of effects is beyond the scope of this report. It is assumed that if the releases are within the limits set forth in the NPDES, NRC radiological release limits, or other permits for a facility, then the potential effects on the general site ecology and the bald eagles, in particular, are not significant.

### **4.2.2 Avian Electrocution**

The potential for electrocution of birds on transmission lines was mentioned as a concern in several of the responses received from the USFWS. Most of the concerns specifically addressed bald eagles, but other large species such as whooping cranes, peregrine falcons, owls, and other raptors were also mentioned. There is a potential for avian electrocution wherever there are high-voltage power transmission lines. The problem may be most prevalent in areas where the transmission lines cross river, wetlands, or riparian areas.

For the purposes of comparing the sites, it is assumed that the probability of avian electrocution is directly proportional to the length of the transmission line system. Therefore, a power plant with very long transmission lines is more likely to have one or more electrocutions than a power plant with relatively short lines. The overall density of large birds in the vicinity of the lines certainly plays an important role in the actual number of electrocutions, but density information is not currently available for any of the sites.

The potential for avian electrocution also is highly dependent on the structure and configuration of the transmission lines and supporting towers. In most cases there is insufficient information about these structures, modifications to the structures since original design, or measures taken to mitigate raptor electrocution to determine the potential for avian electrocution along any specific transmission line.

The North Carolina Field Office of the USFWS provided suggestions for minimizing raptor electrocutions that are pertinent to all sites and transmission lines:



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- Avoid wetland and river crossings when possible. If not possible, construct lines to maximize visibility to raptors by removing the static line, enlarging the static line to improve visibility, or mounting aviation balls or similar markers on the static line.
- Cover any energized parts and jumpers, and ensure that other structures are raptor-proof.
- provide sufficient gapping between the ground wire and insulation bracket, and between the ground wire and the neutral wire on single phase lines.
- Separate phases on three phase lines by lowering the cross arm, raising the center phase on a pole-top extension, or using a longer cross-arm; the objective is to separate phases by at least 150 cm (60 inches).
- Install conductor insulation on three phase lines (such as PVC tubing) for at least 90 cm (36 inches) on either side of pole top insulator and replace metal cross arm braces with wooden braces.
- Install wooden perches approximately 30 to 40 cm (12 to 16 inches) above the cross arm on three phase lines. This height will prevent raptors from landing below the perch, but is sufficiently tall to prevent the tail from reaching an energized object below the perch.

A general recommendation is that all licensees review the structural configurations of their transmission lines and towers and take reasonable and prudent steps to minimize the potential for raptor electrocution. Some of the licensees, such as those in Virginia, have already worked with the USFWS and/or state agencies to minimize or eliminate this problem.

### **4.2.3 Transmission Line Routing and Maintenance**

When all information from all sites is considered as a whole, the most persistent data gap concerns the routing and location of the transmission lines. In general, the only information about the routes and locations of the transmission lines comes from the FESs, and that information varies greatly among sites. Most of the sites provide generalized maps of the transmission line routes, but some provide little or no information.

Most of the uncertainties associated with terrestrial threatened and endangered species are a result of the lack of information about where the transmission lines are routed in relation to the locations of rare species populations and other potential habitat areas for those species. This information will be required to ensure complete compliance with the ESA at most sites. Therefore, evaluation of the majority of terrestrial issues will require detailed maps of the transmission corridors, and subsequent interactions with the appropriate USFWS field office, state agencies, and other parties to determine what, if any, impacts the transmission lines may have on terrestrial threatened and endangered species.

A second issue associated with the transmission lines concerns the corridor maintenance practices used by the utilities. In most cases no information is presently available concerning these maintenance procedures. Undoubtedly, practices vary considerably depending on the biological setting. Corridors through deserts, scrub-lands, and other areas with low growing vegetation may require little maintenance other than periodic inspections of the towers. In forested areas, considerable amounts of periodic cutting or clearing of the corridors may be needed. Information concerning the general maintenance requirements and procedures at each site will be required before a full evaluation of potential impacts of the transmission lines can be performed.

#### **4.3 Prioritization of Sites**

The evaluation criteria described in Section 4.1 were applied to all 75 commercial nuclear power generating facility sites and the sites were then classified into 4 priority groups (Low, Moderate-Low, Moderate-High, and High priority) based on these criteria. The following sections list the sites within each priority grouping, and provide the basis for the priority assignments. More detailed information summaries are provided for each site in Appendix D.

##### **4.3.1 Low Priority Sites Believed to be in Compliance**

Twenty-nine of the sites evaluated were determined to be of low priority for detailed follow-up analysis. The information examined indicates that there is little or no reason to believe that these sites are not in compliance with the ESA, and any outstanding questions are minor. Of these 29 sites, seven are considered low priority primarily because the only unit at each of these sites is at some point in the decommissioning process (Table 5). In most cases these plants would have been considered low priority even if they were still operating. Since they have permanently ceased operations, future adverse aquatic impacts are highly unlikely, and most have relatively short transmission lines and relatively few threatened or endangered terrestrial species in the vicinity of the plant or transmission lines. Additionally, any potential effects should be considered in the site-specific decommissioning environmental analyses.

The remaining 22 low priority sites (Table 6) are believed to be in compliance with the ESA because the probability of adverse impact to threatened or endangered species was determined to be low. This is because there are either no threatened or endangered species in the plant vicinity, or because the plant has low ecological impact (due to low water use, intake / discharge structures that mitigate impacts, or very short transmission lines), or in many cases both of these factors. In the case of Watts Bar, a low priority was assigned because a complete analysis and consultation with the USFWS was performed in 1995 as part of the operating license FES.

##### **4.3.2 Moderate - Low Priority Sites**

Fifteen of the sites were judged to be moderate to low priority for detailed follow-up assessments (Table 7). These sites are most likely in compliance with the ESA, but in each case there are one or more uncertainties that would need to be addressed before complete ESA compliance can be assured. However, the potential for adverse impacts to threatened or endangered are sufficiently low that limited resources for follow-up actions would be better utilized at higher priority sites.

##### **4.3.2 Moderate - High Priority Sites**

Sixteen of the sites were judged to be moderate to high priority for follow-up assessment (Table 8). Additional evaluations at these sites is warranted, but commitment of resources to these evaluations will probably be precluded until other sites that have more pressing issues are addressed first. For each of the sites in this group there are numerous uncertainties about the presence of threatened or endangered species in the vicinity of the plant site or transmission lines, and about the potential impacts that plant operations or transmission line maintenance may have on those species if they are present.

#### 4.3.4 High Priority Sites

Fifteen of the commercial nuclear power generating facility sites were judged to be high priority for detailed follow-up assessments (Table 9). These sites have the most pressing issues that need to be addressed, or have the largest numbers of uncertainties concerning the presence and potential impacts to threatened or endangered species. None of these sites has been positively identified as being out of compliance with the ESA, but they do have a greater potential for adverse impacts to threatened or endangered species than sites in the other priority groups.

Table 5. Low Priority Sites Undergoing Decommissioning

Site	Summary
Fort St. Vrain	The facility is being decommissioned, which reduces potential adverse impacts. No aquatic species of concern are believed to be in vicinity, bald eagles are known from area, but continued operation of the relatively short transmission lines is unlikely to adversely affect this species.
Haddam Neck	This facility has ceased operations. Shortnose sturgeon are potentially in the area, but none have been taken over the 28 years of facility operation. The few terrestrial species potentially in the area are unlikely to be adversely affected.
La Crosse	This facility has been decommissioned, thereby eliminating adverse aquatic impacts. Several terrestrial species of concern may be in the vicinity, but since the plant is not operating and the transmission lines are less than 1 mile long, impacts to terrestrial species of concern are highly unlikely.
Rancho Seco	Although the facility is located in an area relatively rich in species of concern, it has been placed in a storage configuration. Therefore, adverse ecological impacts are unlikely.
Shoreham	This facility has been inactive, and will be for the foreseeable future, therefore impacts to aquatic species of concern are unlikely. Impacts to rare terrestrial species are unlikely because the transmission lines are less than 0.8 km (1 mile) long.
Trojan	This facility is being decommissioned. A recent environmental assessment concluded that the decommissioning process would have no adverse impacts to threatened or endangered species.
Yankee Rowe	The facility is being decommissioned and the transmission lines are short. No aquatic species of concern are likely to be in vicinity, the only terrestrial species of concern likely to be in the vicinity is the bald eagle which is not likely to be affected by decommissioning activities or transmission line maintenance.

Table 6. Low Priority Sites Unlikely to be out of Compliance

Site	Summary
Arkansas	No rare aquatic species are known to be in the facility vicinity. Bald eagles are potentially in the area but are unlikely to be adversely affected by the plant or transmission lines. Evidence does not suggest that other species exist in the area or would be affected by transmission line maintenance.
Big Rock Point	The facility is operating, but decommissioning is planned in the near future. No aquatic species of concern are believed to be in vicinity. Few terrestrial species of concern are in the vicinity, and the transmission lines are believed to be relatively short.
Beaver Valley	Impacts to aquatic species of concern is unlikely unless one or more of several endangered mussel species recolonize this portion of the Ohio River. Terrestrial species of concern are unlikely to be either present or affected by facility operation.
Clinton	No rare aquatic species are believed to be in vicinity. Indiana bats, bald eagles, and several remnant prairie plant species may occur in the vicinity. Facility operation is not likely to affect these species.
Fermi	No rare aquatic species are likely to be in the facility vicinity. The eastern prairie fringed orchid and other plant and insect species could be affected by transmission line maintenance if any native habitat remains in the area.
Fitzpatrick	No rare aquatic species are believed to be in vicinity. Bog turtles are the only rare terrestrial species that may occur along transmission lines.
Ginna	No rare aquatic species are believed to be in vicinity. Bog turtles may occur along transmission lines, but the lines are only 6.4 km (4 miles) long, making it unlikely that this species will be adversely affected.
Grand Gulf	Relatively few threatened or endangered species are known to be in the area, and potential adverse effects on most of the species potentially present have been previously evaluated.
Indian Point	The shortnose sturgeon is the only threatened or endangered species potentially in the facility vicinity, and no takes have been reported during the 20 years of plant operations. The transmission lines are less than 0.8 km (1 mile), therefore impacts to terrestrial species are unlikely.

Table 6. Low Priority Sites Unlikely to be out of Compliance - Continued

Site	Summary
Kewaunee	There are no rare aquatic species in the facility vicinity, and no rare terrestrial species in the county. The transmission lines probably are not located near populations of the few terrestrial species potentially in the area, except for bald eagles which are unlikely to be adversely affected.
McGuire	The facility is located on an artificial reservoir with no known rare aquatic species. Transmission lines are short, so adverse impacts are unlikely.
Monticello	There are no threatened or endangered aquatic species known from the site vicinity. Bald eagles nest in the area, but are unlikely to be adversely affected by facility operations or maintenance.
Nine Mile Point	No rare aquatic species are believed to be in the site vicinity. Bog turtles are the only rare terrestrial species that may occur along transmission lines.
Peach Bottom	Adverse impacts to threatened or endangered aquatic species are unlikely. Bald eagles and bog turtles are the only rare terrestrial species likely in the area and the transmission lines are relatively short.
Point Beach	There are no rare aquatic species in the facility vicinity. The transmission lines are not located near populations of the few terrestrial species in the area, except for bald eagles which are unlikely to be adversely affected.
Seabrook	There is a small potential for impacts to sea turtles, but the cooling water intake configuration probably minimizes impacts. Bald eagles are potentially in the area, but are not likely to be significantly affected.
Susquehanna	No threatened or endangered aquatic species are likely to be in the site vicinity, relatively few rare terrestrial species are in the area, and the potential of adversely affecting those species is low.
Three Mile Island	No threatened or endangered aquatic species are likely to be in the site vicinity, relatively few rare terrestrial species are in the area, and the potential of adversely affecting these species is low.
Vermont Yankee	No rare aquatic species are likely to be in the site vicinity, the only terrestrial species of concern likely to be in the vicinity is the bald eagle which is not likely to be affected by facility operations or transmission line operation or maintenance. The transmission lines are short.

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Table 6. Low Priority Sites Unlikely to be out of Compliance - Continued	
Site	Summary
Waterford	The pallid and gulf sturgeons are potentially in the area, but there is little data that they are present at the site or are impacted by facility operations. Bald eagles are the only rare terrestrial species likely to be in the area.
Watts Bar	Potential ESA issues were addressed in depth for the operating license issued in 1995. No additional species have been identified that are likely to be in the vicinity that were not included in the 1995 consultation.
WNP-2	There is a low probability of adverse impacts to either aquatic or terrestrial rare species. Bald eagle populations have grown during the period of facility operation. Listed fish species are not likely to be in the vicinity.

Table 7. Moderate To Low Priority Sites	
Site	Summary
Arnold	Peregrine falcons breed in the county, and several remnant prairie plant species potentially inhabit the transmission corridors.
Browns Ferry	A large number of rare mussels and fishes have a small potential to inhabit Wheeler reservoir. The eastern indigo snake, red-cockaded woodpecker, and several rare plant species may be in the vicinity of the facility.
Callaway	Bald eagles nest within 3.2 km (2 miles) of the site, and both Indiana and gray bats are occasionally in the area. The pallid sturgeon, sicklefin and sturgeon chubs, and pink mucket pearlymussel have a small potential to be affected.
Calvert Cliffs	Sea turtles are in the area, but there have been no reported takes during 20 years of operation. Two species of rare tiger beetles are on the site property, but these are being monitored by The Nature Conservancy. Other rare terrestrial species have a low potential to be adversely affected.
Catawba	No rare aquatic species are known to occur in Lake Wylie, several rare terrestrial species are in the area, but the transmission lines are relatively short.
Comanche Peak	There are no rare aquatic species near the facility. Between 4 and 8 rare bird species may occur in the area, but the transmission lines are short.

Table 7. Moderate To Low Priority Sites - Continued

Site	Summary
Dresden	There are no rare aquatic species near the facility. Bald eagles winter in the site vicinity, and 2 rare plant species potentially occur in the area, but are not likely to be affected by the transmission lines.
Fort Calhoun	The transmission lines are very short, making adverse terrestrial affects unlikely. The sturgeon and sicklefin chubs and the pallid sturgeon are likely in the Missouri River, but the facility is relatively small.
Limerick	Shortnose sturgeon are in the facility vicinity, but effects are probably minimized by the closed-cycle cooling system. Bog turtles, falcons, and eagles may be in the area, but transmission lines are relatively short.
Millstone	The facility is large and uses once-through cooling, and there are several species of sea turtles in the area. However, no turtles have been taken during 25 years of operation, indicating that the potential for direct adverse impacts is low. Adverse effects on terrestrial species are doubtful.
Oyster Creek	Sea turtles have been taken at this site, but formal consultations with NMFS have been pursued. The transmission lines are short, minimizing the potential for adverse impacts to the terrestrial species that may be in the area.
Palisades	There are no rare aquatic species in the site vicinity. Several terrestrial species have a low potential for occurring in the area, but the transmission lines are relatively short.
Prairie Island	The Higgin's Eye pearlymussel potentially occurs near the site, bald eagles nest near the site. There is a small potential for several remnant prairie species to occur in the vicinity of the transmission lines
Wolf Creek	The Neosho madtom occurs below Wolf Creek reservoir, but is not likely to be affected by facility operations. Bald eagles nest adjacent to the reservoir, and at least 2 remnant prairie species have a small potential to occur along the transmission line corridors.
Zion	No rare aquatic species are known to occur near the site. Several remnant prairie species are known to occur within 16 km (10 miles) of the facility, but the transmission line corridors generally pass through developed and highly populated areas.

Table 8. Moderate To High Priority Sites	
Site	Summary
Braidwood	At least 4 remnant prairie plant species are known to occur in Will county, and the transmission lines are moderately long.
Byron	Indiana bats are possible in the area, bald eagles winter nearby, and at least 3 remnant prairie plant species are likely to be in the area. Transmission lines are moderate in length.
Cook	Several remnant prairie plant species are potentially in the area. Transmission lines extend well into Indiana, and little is known about the species or habitats along those lines.
Crystal River	Sea turtles, manatees, and gulf sturgeon may be affected by operations. The transmission lines are relatively long, and may impact the eastern indigo snake, at least 4 rare bird species, and many rare plant species.
Davis-Besse	The transmission lines are moderate in length and have the potential to impact a number of rare terrestrial plant and animal species.
Farley	The transmission lines are long and potentially impact numerous rare terrestrial species including wood stork, red-cockaded woodpecker, eastern indigo snake, and several plant species (especially the relict trillium).
LaSalle	Critical habitat for the Indiana bat is nearby, the transmission lines are relatively long, and the presence of leafy prairie clover, decurrent false aster, and other remnant prairie plant species is likely.
Maine Yankee	State designated essential bald eagle habitat is nearby, shortnose sturgeon have been taken, and recently protected runs of Atlantic Salmon may occur in the near vicinity.
North Anna	The transmission lines are relatively long, and have the potential to impact small-whorled pogonia and swamp pink, as well as 2 rare mussel species at river crossings.
Perry	Indiana bats are known in the near vicinity of the site. Transmission lines are moderately long, and could affect piping plovers, falcons, eagles, northern wild monkshood, and Mitchell's satyr butterfly.



Table 8. Moderate To High Priority Sites - Continued

Site	Summary
Pilgrim	Cape Cod Bay is designated critical habitat for the Right whale. Sea turtles occur in the area, and piping plover could be affected by site operations. Plymouth red-belly turtles are known in the immediate area and could be affected by transmission line maintenance, but the lines are relatively short.
Quad Cities	The Higgin's eye pearlymussel occurs near the site, and "essential" habitat occurs is within 1.8 km (1.1 mile). Several remnant prairie plant species may be affected by maintenance of the relatively long transmission lines.
Robinson	The red-cockaded woodpecker occurs on the facility site. Other species that could be affected by transmission lines include eagles, falcons, and a number of rare plant species. The lines are moderately long.
Sequoyah	The transmission lines are relatively long, at least 2 and possibly many more rare plant species may be affected by corridor maintenance. There is a small potential that several rare mussels and fish are near the facility site.
Summer	The transmission lines are relatively long, and may affect red-cockaded woodpeckers, and potentially as many as 15 rare plant species.
Surry	Sea turtles are potentially affected, but impacts are probably minimized by the canal system used for intake and discharge. Total length of the transmission lines is unclear, but could be as long as 160 km (100 miles). Species potentially impacted include red-cockaded woodpecker, sensitive joint-vetch, and potentially several other plant species.

Table 9. High Priority Sites	
Site	Summary
Brunswick	There are both aquatic and terrestrial concerns. The facility is of moderate size, uses once-through cooling, and is located on an estuary. Sea turtles and manatees are known to use the lower reach of the Cape Fear River. Numerous terrestrial species are likely to occur along the very long transmission lines.
Cooper	There are both aquatic and terrestrial concerns. Although relatively small in thermal output, this facility uses once-through cooling and is located on a medium-sized river. Three rare fish species are known nearby, and several avian and at least 2 plant species of concern could be affected by either the facility or operation and maintenance of transmission lines.
Diablo Canyon	There are both aquatic and terrestrial concerns. Green sea turtles have recently been taken at the intake structure. Other aquatic species potentially affected include the sea otter and the Pacific ridley sea turtle. Many terrestrial species of concern, including at least 25 plant and 17 animal species are likely to occur in the vicinity of the site or transmission lines. Transmission lines are relatively long at 261 km (163 miles).
Harris	The Cape Fear Shiner, red-cockaded woodpecker, and several rare plant species are known to occur within the vicinity of the facility. The transmission lines are relatively long at 208 km (130 miles).
Hatch	Concerns are primarily with rare terrestrial species, although the shortnose sturgeon is known in the Altamaha river near the plant. Transmission lines are long (440 km or 275 miles) and many rare species are likely to occur near the facility or transmission lines, including wood stork, red-cockaded woodpecker, eastern indigo snake, and several rare plant species.
Hope Creek	The concerns are primarily for rare terrestrial species, although there are numerous rare aquatic species known to occur in the immediate vicinity. Terrestrial species of concern include several plants, bald eagles, and bog turtles. The transmission lines are relatively long (182 km or 114 miles).
Oconee	Concern is for threatened and endangered terrestrial species. No rare aquatic species are believed to be in the vicinity of the power plant site. The transmission lines are long (528 km or 330 miles), and several threatened or endangered plant species are likely to occur in the vicinity of the lines, as are eagles, peregrine falcons, and Indiana bats.

Table 9. High Priority Sites - Continued

Site	Summary
Palo Verde	Concern is for threatened and endangered terrestrial species. Facility operation is unlikely to directly impact any aquatic species. Numerous terrestrial species may be affected by operation and maintenance of the very long (936 km or 585 miles) transmission lines. Several rare aquatic species could be affected where the transmission lines cross streams.
River Bend	The primary concern at this site is the proposed critical habitat for the Louisiana Black Bear within 16 km (10 miles) of the site. More data is required about the location of this proposed critical habitat in relation to the facility and transmission lines to determine if any adverse affects are likely.
Salem	There have been numerous takes of sea turtles and shortnose sturgeon. However, these species can be considered "managed" at this site. Terrestrial species of concern include several plants, bald eagles, and bog turtles. The transmission lines are relatively long (170 km or 106 miles).
San Onofre	There are both aquatic and terrestrial concerns. It is a relatively large, once-through cooled power plant on an ocean. Aquatic species potentially affected by the facility include the southern sea otter and the green and loggerhead sea turtles. Terrestrial species potentially affected include numerous bird and plant species. The transmission lines are relatively long (165 km or 103 miles).
South Texas	Adverse impacts to aquatic species are unlikely because the power plant is located on an artificial cooling reservoir, although there are a number of aquatic species known to occur nearby in Matagordo Bay. At least 10 terrestrial species of concern are known to exist in the vicinity of the site or transmission lines, which are long (637 km or 398 miles).
St. Lucie	There have been takes of sea turtles; however the aquatic species most likely to be affected by facility operations are considered to be "managed." Numerous terrestrial species of concern are known in the vicinity of the power plant. However, the transmission lines are short (21 km or 13 miles). Critical habitats for both the manatee and the Everglades snail kite are located near the facility.
Turkey Point	Five species of sea turtles, crocodiles, and manatees are known from the site, the crocodiles and manatees are "managed". Numerous terrestrial species of concern are known from the immediate site vicinity. However, the transmission lines are short (30 km or 19 miles). Critical habitats for the West Indian manatee, American crocodile, everglade snail kite, and Cape Sable seaside sparrow are located near the power plant.

Table 9. High Priority Sites - Continued	
Site	Summary
Vogtle	The primary concern is with potential impacts to terrestrial species, although the shortnose sturgeon is known from the vicinity of the power plant. The transmission lines are very long (891 km or 557 miles) and at least 7 plant and 5 animal species of concern are likely to occur in the vicinity of the facility or transmission lines.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Status of ESA Compliance by Licensed Nuclear Power Generating Facilities**

The first, and perhaps most significant, finding of this evaluation is that there were no identified cases in which take (including either direct mortality or other adverse impacts) of a threatened or endangered species occurred without appropriate follow-up action by the licensee and/or the NRC. Several instances of direct take (i.e., impingements) and other potential impacts (i.e., species known to inhabit the facility property) were identified. In all instances, this evaluation indicated that appropriate actions had been taken, at least by the licensee, through initiation of consultations with the appropriate agencies and/or the development of species management plans or agreements. The recently reported taking of a green sea turtle at Diablo Canyon does merit review by the NRC.

Although no situations were identified in which direct takes were or are occurring without appropriate notification of the responsible resource agencies, this evaluation did determine that there are uncertainties about full compliance with the ESA at nearly every site examined. If there are any adverse impacts to threatened or endangered species resulting from the operation of a licensed nuclear power plant or associated facilities, we do not believe that these impacts are the result of flagrant or purposeful disregard of the ESA by the licensee. Instead, these impacts probably would be the result of the licensee (and NRC) being unaware of the presence of one or more listed species in a particular area, and that operation of the power plant or associated facilities may be adversely impacting those species.

The primary reasons that the licensees and the NRC may be unaware of these impacts include the following:

- Species are continually added to the lists of threatened and endangered species maintained at 50 CFR 17.11 and 50 CFR 17.12. In most cases, potential impacts to species listed after the publication date of the FES for a facility probably never have been evaluated.
- Information concerning the occurrence and distribution of threatened and endangered species is continually changing, and presumably, improving. Therefore, new populations of listed species may have been identified by USFWS or NMFS that may be affected by the operation of a power plant or associated facilities.
- Licensees may not have adequate systematic monitoring programs in place to detect all instances where incidental taking has occurred.
- Many of the listed species, especially the plants, insects, mussels, and other less conspicuous groups are difficult to identify, and may not be noticed except by experts in that particular group of organisms.

### **5.2 Summary of Identified ESA Compliance Uncertainties**

The uncertainties concerning ESA compliance by any particular licensed nuclear power generating facility fall into two general categories:

- What threatened or endangered species are present in the vicinity of the facility?
- How does the operation of the facility affect those species?

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The first question must be addressed before the second. If there are no listed species present near a facility, the question of operational effects does not need to be addressed. In all cases, however, at least one listed species was identified as potentially occurring in near enough proximity to the facility that the question of potential effects should be considered.

Uncertainties concerning the potential presence of a species in the vicinity of a facility have resulted because the level of detail available at the scale of this evaluation is insufficient to fully evaluate the presence or absence of a particular species at a particular site. There are several exceptions where a particular species undoubtedly occurs at a particular site, such as red-cockaded woodpeckers on the Shearon-Harris property and sea turtles and shortnose sturgeon at Salem. In most cases, however, the only conclusion possible is that a particular species probably occurs in an area that includes the facility in question.

Uncertainties concerning the potential impacts of facility operation on listed species are more difficult to generalize because the potential effects are dependent on the particular species in question, how it is distributed in relation to the power plant or transmission lines, and the species-specific responses to facility operation and maintenance. Full assessment of these uncertainties requires more detailed species- and facility-specific information than compiled within the scope of this broad-scale evaluation.

A majority of the uncertainties associated with the high and moderate-high priority sites are concerned with the potential effects of transmission line maintenance on terrestrial threatened or endangered species. There are several reasons:

- Most of the higher priority sites have relatively long transmission line systems, and very little information is readily available about the routing of the lines, the habitats encountered along the lines, the procedures used to maintain the lines, or the distribution of either known populations of threatened or endangered species or potential habitats for these species in relation to the transmission corridors.
- The potential aquatic effects of nuclear power plants have, in general, received much more attention and evaluation than potential terrestrial effects. In most cases, consideration was given at the time of design and licensing to the control and mitigation of adverse ecological impacts to the aquatic environment through the analysis of thermal plume effects and control, cooling water intake velocity, intake structure configuration, etc. Much of this analysis was performed in support of the acquisition of an NPDES permit for the site, and monitoring of these parameters is continually performed for the maintenance of these permits. Control of these factors subsequently reduces the likelihood of adverse impacts to threatened and endangered aquatic species.
- There are more threatened and endangered terrestrial species potentially affected than there are aquatic species. Furthermore, many of the most commonly encountered rare aquatic species are more "obvious" (such as sea turtles, sturgeon, or manatees) than many or most of the terrestrial species potentially affected. If a species is readily identifiable by non-biologists, it is more likely to be noticed in an area, and appropriate management actions are more likely to be taken. This is unlikely to occur for a non-descript threatened plant species, even if it is growing beside the front door of a power plant.

### **5.3 Recommended Follow-up Actions**

It is anticipated that most of the ESA compliance uncertainties associated with each facility can be resolved via direct interactions with the licensees and more detailed interactions with the USFWS (and NMFS if

appropriate). However, an attempt to initiate these interactions concurrently at all sites is likely to be difficult to control, result in fewer tangible results per site, and bring fewer uncertainties per site to closure than if efforts are focused on a small number of facilities at a time.

Instead, it is recommended that follow-up efforts first be focused on the 15 sites identified in Table 9 as High Priority sites, followed by at least some of the 16 sites identified in Table 8 as being Moderate-High priority. The lower priority sites could then be evaluated depending on the results of the assessments of the higher priority sites. If numerous ESA-related issues are substantiated at the higher priority sites, and it appears that the pattern would continue at the lower priority sites, then it would be prudent to eventually evaluate all of the licensed facilities in detail. However, if very few problems are substantiated at the higher priority sites, the expense required for detailed assessments at the lower priority sites may not be justifiable. Focusing on the higher priority sites will provide the highest potential benefit to cost return (i.e., the greatest number of uncertainties and the most pressing issues addressed for a given level of effort).

It is expected that most of the detailed assessment work can be accomplished remotely using written correspondence, fax-transmittals, teleconferences, and electronic data transfer. In some cases face-to-face meetings that include all appropriate parties may be required, and in a few cases field surveys to determine the presence or absence of one or more species may be required.

It is expected that the majority of the identified uncertainties will be determined to be non-issues, either because the species in question does not actually occur in the near vicinity of the power plant or transmission lines, or if it does, that the impacts of operations are minimal. Instances in which a listed species is identified as occurring near a facility and is potentially adversely affected by the operation of the facility will have to be addressed on a case-by-case basis. In many instances, a conservation management plan could be developed that would provide sufficient protection to the species without significant burden to the licensee.

### **5.3.1 Recommended Procedure for Detailed Assessments**

The following steps should be required once a site has been selected for detailed follow-up assessment:

- Consolidate the information compiled for the site into a packet that can be provided to the licensee and the appropriate resource management agencies.
- Prepare letters to the licensee and the resource agencies explaining the purpose and intent of the detailed assessment, the specific information requested from each party, and requesting that an individual be identified to serve as a point of contact for the licensee or the agency.
- Request the licensee to provide detailed information pertaining to the specific uncertainties identified for the facility, such as detailed maps of transmission corridors, corridor maintenance procedures, environmental surveillance reports, etc.
- Request the resource agency to provide detailed information about the known populations and other potential habitat areas for each listed species potentially present near the facility.
- Analyze and overlay the information provided by the licensee and resource agency to determine which, if any, species are likely to be affected by facility operation or transmission line maintenance.

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If this analysis indicates that there are no species likely to be affected by facility operations, then the detailed assessment would end at this point. If one or more listed species are identified, then the following steps should be implemented:

- Gather species-specific ecological information for those species potentially affected.
- Identify which aspects of the facility operations are likely to affect the listed species.
- Work with the licensee to prepare a biological assessment of the impacts of plant operations on the affected species.
- Provide the biological assessment to the resource agency for review and concurrence.

The biological assessment would be similar to the biological assessments prepared as part of the ESA Section 7 consultation process. The assessment of the affects should include as much of the detailed operational data as possible.

If the biological assessment determines that there are no potential adverse impacts of site operations on the listed species, then the detailed assessment would stop at that point, and no further action by any of the parties would be necessary.

If the biological assessment concludes that adverse impacts are occurring or that a potential exists for adverse impacts, then a plan to manage and conserve the affected species should be developed cooperatively by the licensee, the resource agency, and the NRC. The inclusion of additional parties such as appropriate state natural resource agencies or private groups such as The Nature Conservancy may prove useful in the development of such plans.

A conservation management plan need not be complicated. For example, if an endangered plant species is found to occur within a transmission line corridor, the plan might outline modifications to existing corridor maintenance procedures in the vicinity of the population(s), mitigation measures to reduce existing threats within the corridor (such as erosion or grazing easements), and monitoring of the population(s) by the licensee, the resource agency, or by a third party.

### **5.3.2 Recommended Starting Points**

Initial follow-up actions focusing on two sites are recommended. These sites are River Bend and Diablo Canyon. At each of these sites two types of initial actions are recommended: initiation of appropriate interactions with the resource management agencies to address specific, pressing issues; and initiation of detailed follow-up assessments of overall ESA compliance these sites.

The issues that should be addressed immediately include the following:

- The potential impacts of the River Bend facility and associated transmission lines on proposed Louisiana Black Bear critical habitat. This probably would not require a formal consultation with the USFWS. Instead, it could be addressed following the procedure outlined in Section 5.3.1. The assessment would consist of overlaying maps of the proposed critical habitat (supplied by the USFWS) and maps of the facility and transmission corridors (supplied by the licensee). If there is no overlap, the assessment would be essentially finished. If there is overlap, further evaluation of the potential



impacts would be performed, as well as the development of mitigative or management procedures if needed and appropriate.

- Recent incidental takings of green sea turtles at Diablo Canyon. The licensee reported that a green sea turtle had been found within the intake structure in January of 1997. This was the second such taking in recent years (the previous occurrence was in April 1994). Neither of the turtles were harmed and were released, and in both instances the licensee reported the taking to NMFS and the NRC within 24 hours. Because there have been two similar takings within 3 years, it is appropriate that the NRC staff request a consultation with NMFS under Section 7 of the ESA concerning this species.

Should the NRC choose to perform detailed follow-up assessments of overall ESA compliance, any of the 15 high priority sites would be suitable starting points. However, the first sites selected will inevitably serve as test cases for the remaining sites, and therefore should be selected so that the general lessons learned from the detailed assessments (such as data management and agency interaction procedures) will be applicable to the greatest number of other sites. The River Bend and Diablo Canyon sites represent the two extremes in terms of the number of uncertainties and the level of effort required to address those uncertainties.

The River Bend facility should serve as a good initial test case for the development of the detailed evaluation procedures and the initiation of direct contact with the resource agencies and licensees. The uncertainties associated with this site, though potentially significant, are few in number and should be simple to evaluate. A total of 15 rare species were identified as potentially occurring near this site. Ten were identified solely by GEN&SIS, but were not confirmed by other sources. These ten species should be evaluated, but it is unlikely that they are being impacted by facility operations. The remaining five species include the bald eagle and peregrine falcon, which are probably not affected by facility operations (see Section 4.2.1); the red-cockaded woodpecker, which was mentioned by the USFWS in 1983 as potentially occurring near the site, but was not mentioned in 1996; and the pallid sturgeon, which may occur near the site, but no records of take or other adverse effects have been located. Therefore, only one uncertainty has a significant potential of being a real issue: the potential effects of facility and transmission line operation and maintenance on the Louisiana black bear and its proposed critical habitat. The detailed assessment should be primarily focused on this issue, but each of the other species identified as potentially occurring in the vicinity should also be evaluated. The information currently compiled for the River Bend site suggests that impacts to the other potential species are unlikely to be significant issues, and these conclusions can probably be substantiated without a significant amount of effort. In this case it would be more efficient to assess the potential impacts to the other species identified as potentially occurring near the facility concurrently with the assessment of impacts to the black bear habitat, than to evaluate the other species at a later date.

Diablo Canyon represents the opposite extreme from River Bend, and would provide a test case for the examination of numerous and complex uncertainties concerning both the aquatic and terrestrial systems. A total of 127 rare species were identified as potentially occurring in the vicinity of the power plant or transmission lines, 92 of which are currently listed as threatened, endangered, proposed for listing, or candidates for listing. Undoubtedly, it will be determined that the majority of these species are located only in areas well removed from the locations of the power plant or transmission lines, but even if 90% of the species are determined to be unaffected, there would still be nine species that are potentially affected. Green sea turtles are known to have been recently taken at Diablo Canyon. In addition, a brief examination of final listing rules published by the USFWS indicated that at least six recently listed threatened or endangered terrestrial species are known to occur within 25 km (15 miles) of the Diablo Canyon site, and it

## *Threatened and Endangered Species Evaluation*

appears likely that the transmission lines are located near known populations of these species. The species identified are the California red-legged frog, Morro manzanita, Chorro Creek bog thistle, Pismo clarkia, Indian Knob mountainbalm, and the Morro shoulderband snail. The California red-legged frog was listed in May of 1996, and the other five were listed in December of 1994. Furthermore, two species of fairy shrimp listed in September of 1994 (the longhorn and vernal pool fairy shrimp) are known to occur in or around Soda Lake in eastern San Luis Obispo county; one of the transmission lines traverses the northern part of this lake. Two species of plants that were listed in 1997 (Hartweg's golden sunburst and San Joaquin adobe sunburst) probably occur well to the east of the transmission line routes, but the distribution of potential habitat in relation to the transmission lines would need to be evaluated. Information at this level of detail has not been collected for the 81 other species potentially occurring near the Diablo Canyon facility or transmission lines.

A detailed evaluation of the potential impacts to threatened and endangered species due to the Diablo Canyon power plant and associated transmission lines would follow the procedures previously outlined. A set of detailed maps of the power plant vicinity and transmission line corridors (and corridor access roads), as well as recent information concerning the impacts to the aquatic environment near the facility should be obtained from the licensee. The USFWS and NMFS would then be asked to work with the NRC and the licensee to determine which species are known to exist, or for which suitable habitat exists, near the facilities, and which of those species are likely to be affected by operation and maintenance of the facility or transmission lines. If it is determined that one or more species are likely to be affected, the development of appropriate management plans should be pursued.

The consultation with NMFS concerning the green sea turtle is the highest priority action for the Diablo Canyon site. If the NRC chooses to perform a detailed ESA compliance assessment at Diablo Canyon, it could either be performed concurrently with, or subsequent to the consultation with NMFS.

**APPENDIX A**

**Example Information Request Letter**

**Transmitted to the**

**U.S. Fish and Wildlife Service  
and the  
National Marine Fisheries Service**



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

December 4, 1995

U.S. Fish and Wildlife Service  
Department of the Interior  
Southeast Region 4  
1875 Century Center Boulevard, NE  
Atlanta, GA 30345

Dear Madam/Sir:

The United States Nuclear Regulatory Commission (NRC) is assessing the status of NRC/Licensee programs, at each of the commercial nuclear power generating facilities under its licensing jurisdiction, to further the conservation of species protected under the Endangered Species Act (ESA). The NRC is not aware of any non-compliance with the ESA by any licensee. The NRC and its contractor, the Pacific Northwest Laboratory (PNL), are developing a database and process that will help to ensure the continued preservation of species protected under the ESA.

In support of this assessment effort, the NRC requests from the USFWS the information listed in Attachment 1. Please note that this is an information request only, and not a request for any formal or informal consultation under Section 7 of the ESA. The NRC will address any follow-up issues, including the initiation of formal or informal consultations, if needed, during the second phase of this assessment effort.

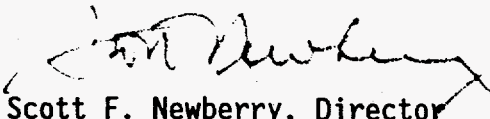
The information that we are collecting and reviewing during the first phase of the assessment includes: Listed species that are known or have a potential to occur near each plant site, previous formal or informal Section 7 consultations between the USFWS and the NRC and/or licensee, and incidental take permits. Once this information is collected and reviewed the follow-up actions will then be initiated on a priority bases during the second phase of the assessment effort.

Information about the 20 licensed commercial nuclear power plants and their locations within USFWS Region 4 is provided in Attachment 2. Most of the sites include both the power plant itself and transmission lines that were included in the Final Environmental Statement (FES) for each power plant. As a general consideration, we requested information about any species that occur within 10 miles (16 km) of the plant or transmission lines, but we also request information about any other species that potentially could be affected by plant operations.

December 4, 1995

If you have any questions concerning the information being requested, or require additional information about the specific plant sites, please contact Mr. Steve Reynolds of the NRC on (301) 415-1115, or you may address them directly to Dr. Michael R. Sackschewsky of PNL on (509) 376-2554. Thank you for your prompt attention to this matter.

Sincerely,



Scott F. Newberry, Director  
License Renewal and Environmental Review  
Project Directorate  
Division of Reactor Program Management  
Office of Nuclear Reactor Regulation

Attachments:  
As stated

cc: Dr. Sackschewsky, PNL

## ATTACHMENT 1

The following information is requested for each site:

- 1) Species listed under the ESA as endangered, threatened, proposed, or candidate level 1 or 2 known to occur within 10 miles of the plant site or associated transmission lines.
- 2) Species listed as endangered, threatened, proposed, or candidate 1 or 2 that based on species-specific attributes and/or professional judgment could be affected by the operation of the power plant or by the operation and maintenance of the associated transmission lines.
- 3) Locations of any designated critical habitats near the plant or transmission lines.
- 4) Known habitat preferences or requirements for any species of concern that may be potentially affected by plant or transmission line operations and maintenance.
- 5) Results of any formal or informal Section 7 consultations concerning the site.
- 6) Any incidental take permits issued for plant operations.
- 7) Any other concerns or potential impacts of plant or transmission line operations and maintenance.

Upon completion, the results should be sent to:

Dr. Michael R. Sackschewsky  
Pacific Northwest Laboratory  
P.O. Box 999 K6-84  
Richland, WA 99352  
Telephone (509) 376-2554  
Fax (509) 372-3515

**ATTACHMENT 2**

# Commercial Nuclear Plant Locations

Site	State	Latitude			Longitude			USFWS	NMFS
		Deg	Min	Sec	Deg	Min	Sec	Region	Region
Diablo Canyon	California	35	12	42	120	51	16	1	SW
Rancho Seco	California	38	20	40	121	7	12	1	SW
San Onofre	California	33	22	13	117	33	25	1	SW
Trojan	Oregon	46	2	27	122	53	4	1	NW
WNP-2	Washington	46	28	17	119	19	59	1	NW
Palo Verde	Arizona	33	23	23	112	51	43	2	x
Comanche Peak	Texas	32	17	52	97	47	6	2	SE
South Texas	Texas	28	47	42	96	2	53	2	SE
Braidwood	Illinois	41	14	37	88	13	44	3	x
Byron	Illinois	42	4	30	89	16	55	3	x
Clinton	Illinois	40	10	19	88	50	3	3	x
LaSalle	Illinois	41	14	38	88	40	15	3	x
Quad Cities	Illinois	41	43	34	90	18	36	3	x
Zion	Illinois	42	26	44	87	48	3	3	x
Dresden	Illinois	41	23	23	88	16	16	3	x
Duane Arnold	Iowa	42	6	2	91	46	38	3	x
Big Rock Point	Michigan	45	21	33	85	11	41	3	x
Cook	Michigan	41	58	34	86	33	59	3	x
Fermi	Michigan	41	57	48	83	15	31	3	x
Palisades	Michigan	42	19	20	86	18	55	3	x
Monticello	Minnesota	45	20	0	93	50	54	3	x
Prairie Island	Minnesota	44	37	19	92	37	59	3	x
Callaway	Missouri	38	45	40	91	46	54	3	x
Davis-Besse	Ohio	41	35	50	83	5	11	3	x
Perry	Ohio	41	48	4	81	8	36	3	x
Kewaunee	Wisconsin	44	20	35	87	32	10	3	x
LaCrosse	Wisconsin	43	33	30	91	13	50	3	x
Point Beach	Wisconsin	44	16	51	87	32	10	3	x
Browns Ferry	Alabama	34	42	15	87	7	7	4	x
Farley	Alabama	31	13	22	85	6	45	4	x
Arkansas	Arkansas	35	18	36	93	13	51	4	x
Crystal River	Florida	28	57	26	82	41	56	4	SE
St. Lucie	Florida	27	20	55	80	14	47	4	SE
Turkey Point	Florida	25	26	6	80	19	53	4	SE
Hatch	Georgia	31	56	3	82	20	40	4	x
Vogtle	Georgia	33	8	31	81	45	53	4	x
River Bend	Louisiana	30	45	26	91	19	54	4	x
Waterford	Louisiana	29	59	42	90	28	16	4	x
Grand Gulf	Mississippi	32	0	27	91	2	53	4	x
Brunswick	North Carolina	33	57	30	78	0	38	4	SE
Harris	North Carolina	35	38	0	78	57	22	4	x
McGuire	North Carolina	35	25	56	80	56	54	4	x
Catawba	South Carolina	35	3	5	81	4	10	4	x
Oconee	South Carolina	34	47	30	82	53	55	4	x



# Commercial Nuclear Plant Locations

Site	State	Latitude			Longitude			USFWS	NMFS
		Deg	Min	Sec	Deg	Min	Sec	Region	Region
Robinson	South Carolina	34	24	9	80	9	31	4	x
Summer	South Carolina	34	18	0	81	18	0	4	x
Sequoyah	Tennessee	35	13	24	85	5	16	4	x
Watts Bar	Tennessee	35	36	0	84	47	24	4	x
Haddam Neck	Connecticut	41	28	55	72	29	57	5	NE
Millstone	Connecticut	41	18	31	72	10	5	5	NE
Maine Yankee	Maine	43	57	2	69	41	46	5	NE
Calvert Cliffs	Maryland	38	26	5	76	26	31	5	NE
Pilgrim	Massachusetts	41	56	40	70	34	46	5	NE
Yankee Rowe	Massachusetts	42	43	41	72	55	44	5	x
Seabrook	New Hampshire	42	53	53	70	51	5	5	NE
Oyster Creek	New Jersey	39	48	51	74	12	23	5	NE
Salem/Hope Cree	New Jersey	39	27	46	75	32	9	5	NE
Fitzpatrick	New York	43	31	26	76	23	54	5	x
Ginna	New York	43	16	40	77	18	32	5	x
Indian Point	New York	41	16	17	73	57	9	5	x
Nine Mile Point	New York	43	31	20	76	24	36	5	x
Shoreham	New York	40	57	29	72	52	1	5	NE
Beaver Valley	Pennsylvania	40	37	19	80	26	2	5	x
Limerick	Pennsylvania	40	13	12	75	45	36	5	x
Peach Bottom	Pennsylvania	39	45	32	76	16	9	5	x
Susquehanna	Pennsylvania	41	5	30	76	8	55	5	x
Three Mile Island	Pennsylvania	40	9	11	76	43	30	5	x
Vermont Yankee	Vermont	42	46	49	72	30	57	5	x
North Anna	Virginia	38	3	39	77	47	26	5	x
Surry	Virginia	37	9	56	76	41	54	5	NE
Fort St. Vrain	Colorado	40	14	41	104	52	28	6	x
Wolf Creek	Kansas	38	14	20	95	41	20	6	x
Cooper	Nebraska	40	21	43	95	38	28	6	x
Ft. Calhoun	Nebraska	41	31	15	96	4	36	6	x

## **BRUNSWICK**

Brunswick Nuclear Project

(Units 1 & 2)

Carolina Power & Light Company

Southport, NC

FES Date: June 1973

Docket Numbers: Unit 1: 50-325

Unit 2: 50-324

**Location:** The plant is located approximately 135 miles SSE of Raleigh, north Carolina, 175 miles east of Columbia, South Carolina, and 150 miles NE of Charleston, South Carolina. The plant is 16 miles south of the nearest boundary of Wilmington, North Carolina, in adjacent New Hanover County, and 2.5 miles north of Southport.

Approximate coordinates of the reactor buildings are:  
latitude 32° 57.5' and longitude 78° 00.5'W.

(33°57'30'' N 78°00'38' W)

UTM: 3761369N 776257E

This places the reactor buildings about 6 miles from the Atlantic Ocean (both south and east of the plant) and about 2 miles west of the Cape Fear River.

**Other Features:** The Holly Shelter Wildlife Management Area is 48,500 acres of mostly swampland in Pender County. It is owned by the North Carolina Wildlife Resources Commission.

The Orton Plantation Waterfowl Impoundment is 10 miles north of the plant.

**Transmission Lines:** Eight 230-kV lines stretching a total of 358 miles were required. They are:

1. Brunswick-Fayetteville -- 103 miles
2. Brunswick-Weatherspoon -- 31 miles of new section
3. Brunswick-Delco East -- 31 miles
4. Brunswick-Delco West -- 31 miles
5. Brunswick-Wallace -- 54 miles
6. Brunswick-Jacksonville -- 76 miles
7. Brunswick-Barnard Creek East -- 16 miles
8. Brunswick-Barnard Creek West -- 16 miles

**Species of Interest:** Some species lists; Table II-7 lists rare & endangered species found in southeastern North Carolina:

- Brown Pelican (*Pelicanus occidentalis*) -- endangered
- Southern Bald Eagle (*Haliaetus l. leucocephalus*) -- endangered
- American Peregrine Falcon (*Falco peregrinus anatum*) -- endangered
- Red-Cockaded Woodpecker (*Dendrocopos borealis*) -- endangered
- Ipswich Sparrow (*Passerculus princeps*) -- rare
- American Osprey (*Pandion haliaetus carolinensis*) -- status undetermined
- American Alligator (*Alligator mississippiensis*) -- endangered
- Green Turtle (*Chelonia mydas mydas*) -- rare in U.S.
- Atlantic Sturgeon (*Acipenser oxyrinchus*) -- rare
- Venus Fly Trap (*Dionaea muscipula*) -- unique
- Sundew (*Drosera* spp.) -- unique

## II. THE SITE

### A. LOCATION OF THE PLANT

The plant is located approximately 135 miles SSE of Raleigh, North Carolina, 175 miles east of Columbia, South Carolina and 150 miles NE of Charleston, South Carolina (Figure I-1). The plant is 16 miles south of the nearest boundary of Wilmington, North Carolina, in adjacent New Hanover County, and 2 1/2 miles north of Southport (Figure I-2). Approximate coordinates of the reactor buildings are latitude 32° 57.5' and longitude 78° 00.5'W. This places the reactor buildings about 6 miles from the Atlantic Ocean (both south and east of the plant) and about 2 miles west of the Cape Fear River.<sup>1</sup>

### B. REGIONAL DEMOGRAPHY AND LAND USE

The plant is situated on the Atlantic Coastal Plain. It is in a region of low relief with elevations ranging from sea level to about 30 ft above mean sea level. Extensive areas of marshes and swamps occur in the region. The Green Swamp, an area of several hundred square miles, occupies a large part of Brunswick County.

A large estuary, the Cape Fear Estuary, is an important waterway in the region. The Atlantic Intracoastal Waterway ties into the estuary for a distance of several miles. Southport, the nearest town, is located about 2 miles from the plant. The 1970 census count for Southport was 2220. Wilmington is the nearest city and has a population of about 50,000. Census data for the Wilmington Standard Metropolitan Statistical Area showed 107,219 in 1970, of which 24,223 were in Brunswick County and 82,996 in New Hanover County. There are no other large cities within 50 miles of the plant. However, Boiling Spring Lakes, a new development 7 miles NNW of the plant is anticipated to be a community of 18,000 by 1996. The 1970 census showed a population of 92.<sup>1,2</sup>

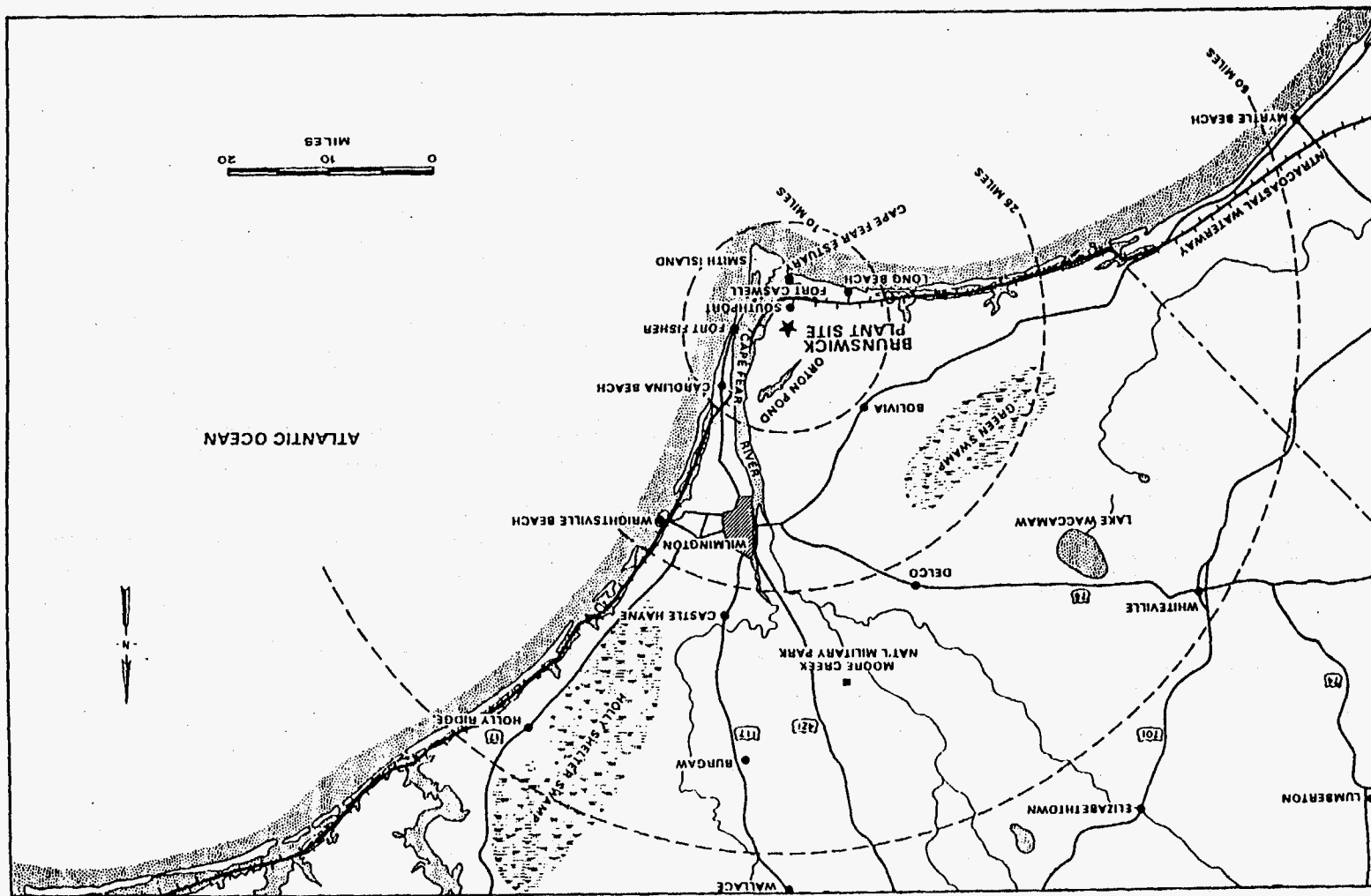
#### 1. Recreational Land Use

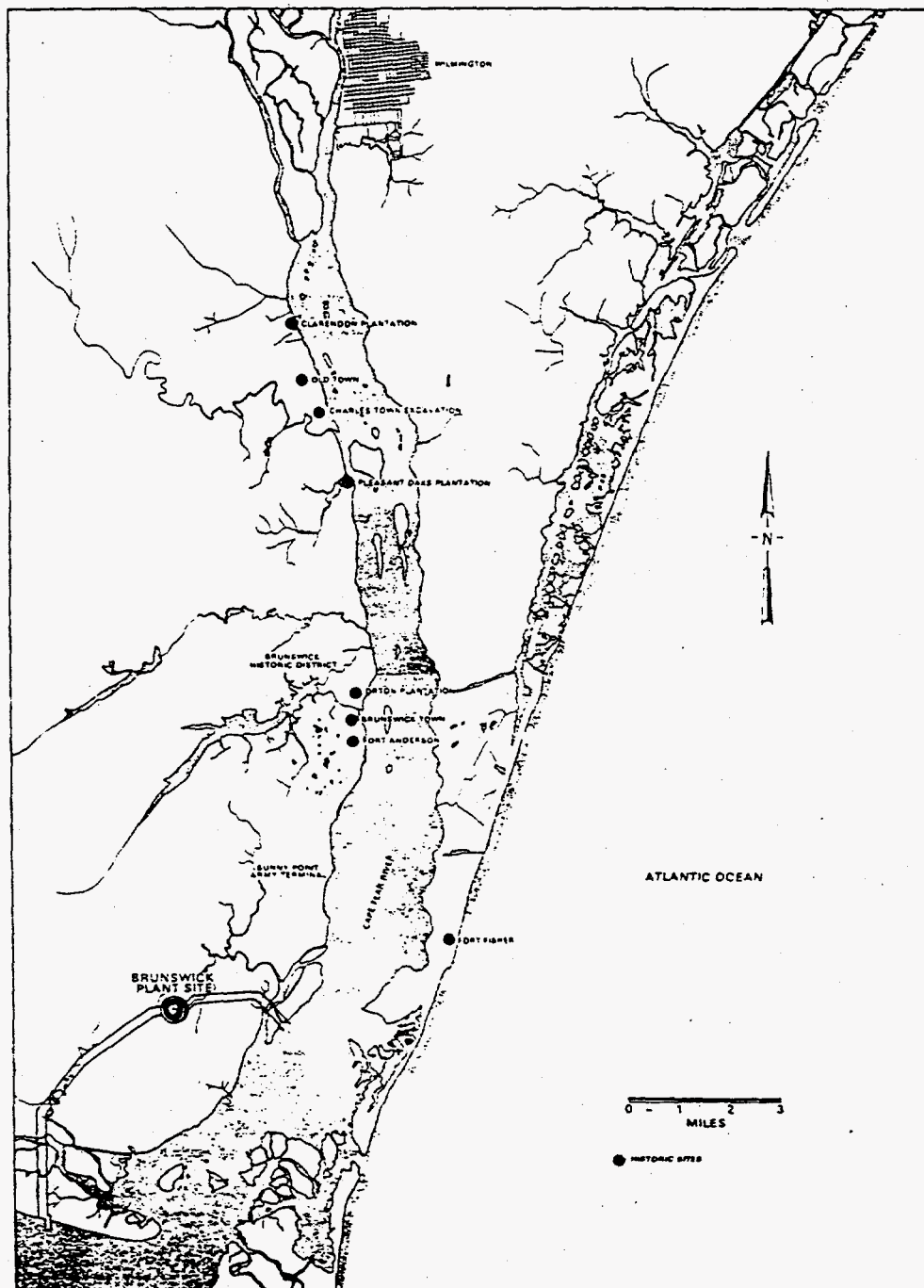
The lower Cape Fear area in Brunswick and New Hanover counties is a popular recreational area. During the summer months the population of the beaches within 20 miles of the plant increases by about 10,000 people. Freshwater and ocean fishing are popular activities in the region. During the season, duck hunting takes place in the salt marshes. The waterways are used by fishing, motor and sailing boats.<sup>2</sup>

#### 2. Agricultural Land Use

Land within a 50-mile radius of the plant is predominantly rural, except for the Southport and Wilmington areas. Less

FIGURE I-1. BRUNSWICK PLANT, GENERAL SITE LOCATION





**FIGURE II-1. AREAS OF HISTORIC SIGNIFICANCE  
NEAR THE BRUNSWICK PLANT**

side of the Intracoastal Waterway, and 50 ft wide at the bottom on the ocean side. The canal is described in greater detail in Section D.

## B. TRANSMISSION LINES

### 1. Physical Features of System

The relative isolation of the plant from the major load centers in the applicant's service area, and the magnitude of the electrical energy being generated by the plant (1642 MW) combine to require about 358 miles of new transmission lines in 205 miles of new (or enlarged) transmission corridors. About 3500 acres of new land is required. The applicant plans to transmit the power via eight 230 kW lines as shown in Figure III-2. These eight lines occupy corridors of varying widths and lengths as shown in Figure III-3.

Each of the transmission lines will be supported by H-frame wooden structures extending about 65 ft above ground level. Approximately nine structures are required per mile per line. Two self-supporting steel towers 335 ft high are used in crossing Cape Fear River at Barnard Creek, south of Wilmington. Two other guyed steel towers will be used on each bank of the river at this location--one for each circuit (two circuits cross at Barnard Creek).

The discharge pumps on Oak Island will receive power over two 24 kV lines from the Caswell Beach 230/24 kV transformers in the plant switchyard to the pumping station. Each circuit will be buried in a 36-in. deep trench dug on top of the western dike of the discharge canal. The routing is entirely underground, including the crossing of the Intracoastal Waterway.

### 2. Basis for Transmission System Design

The criteria suggested for transmission line location include:

- Provides adequate line reliability
- Minimum possible view by the general public
- Minimum crossing of lands where a line would interfere with normal land use development
- Avoids scenic or recreation areas



- Avoids unnecessary clearing of timber
- Avoids historical sites
- Prevents visibility down long corridors at road crossings
- Uses or parallels existing utility or railroad corridors
- Minimum line cost.<sup>1</sup>

All of these criteria can seldom be satisfied in any new transmission system especially one the size and complexity needed for the plant. These criteria, and the applicant's adherence to them, are discussed in Section IV.C.2.

The applicant states that "reliability of service was considered by Carolina Power and Light to be of paramount importance in the design of the transmission system. The design criteria adopted were for a system which would assure that the plant generators would remain electrically stable under the severe condition of a three-phase electrical fault on one transmission line at the plant, simultaneous with a breaker failure."<sup>1</sup>

The applicant further states that:

"Various plant transmission designs were studied. An all 500 kV transmission scheme was considered, which included three 500 kV lines from the plant to the system grid. In addition, schemes for various combinations of 500 kV and 230 kV transmission were considered. These schemes included: f four 230 kV lines and two 500 kV lines;; five 230 kV lines and one 500 kV line; and three 230 kV lines and two 500 kV lines. An all 230 kV transmission scheme was also considered which involved seven 230 kV lines between the plant and the system grid.

"Load flow studies of the above schemes were made. These studies indicated that each of the above schemes had adequate transmission capacity to move the power into the system; however, when stability studies were run, it was determined that none of these schemes would meet the electrical stability criteria and that more transmission lines would be required by all of the plans. An analysis of the stability studies indicated that at least six 500 kV or eight 230 kV lines would be required to meet the stability criteria. For combination 500 kV and 230 kV the studies indicated that eight lines would be required. Six would be 230 kV and two would be 500 kV.

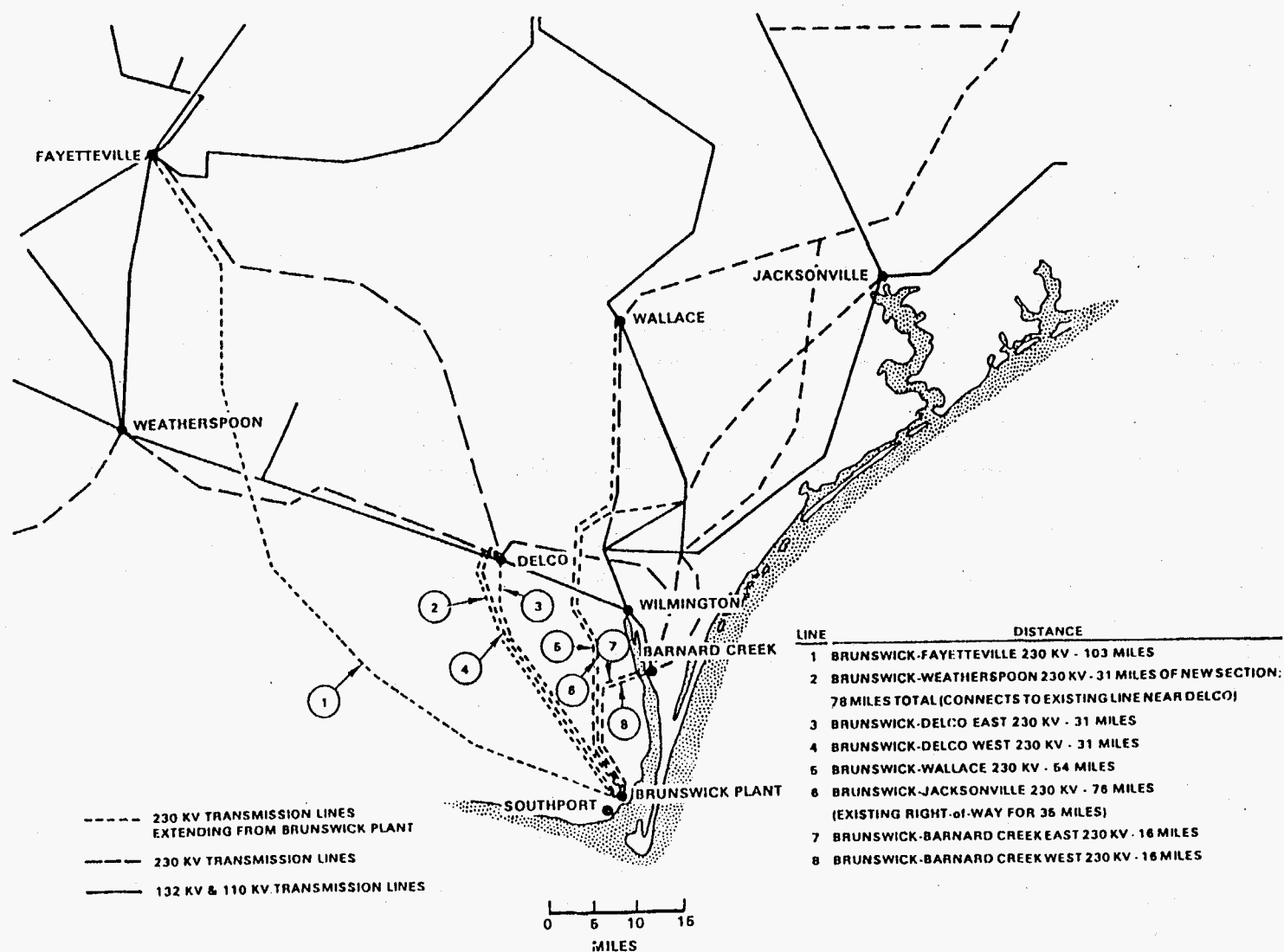


FIGURE III-2. TRANSMISSION SYSTEM FOR BRUNSWICK PLANT SHOWING MAJOR INTERCONNECTIONS (1975)



**APPENDIX B**

**Species Identified as Potentially Occurring Near One or More  
Licensed Commercial Nuclear Power Generating Facilities**

Class	Species		Common Name		Status # Sites:
<b>Amphibians</b>	<i>Ambystoma californiense</i>		California tiger salamander	C	2
Diablo Canyon	Rancho Seco				
<b>Amphibians</b>	<i>Ambystoma macrodactylum</i>		Salamander, Santa Cruz long-toed	E	1
Diablo Canyon					
<b>Amphibians</b>	<i>Batrachoseps aridus</i>		Salamander, desert slender	E	1
San Onofre					
<b>Amphibians</b>	<i>Bufo houstonensis</i>		Toad, Houston	E	1
South Texas					
<b>Amphibians</b>	<i>Bufo microscaphus californicus</i>		Toad, Arroyo southwestern	E	2
Diablo Canyon	San Onofre				
<b>Amphibians</b>	<i>Plethodon shenandoah</i>		Salamander, Shenandoah	E	1
North Anna					
<b>Amphibians</b>	<i>Rana aurora draytoni</i>		California red-legged frog	T	3
Diablo Canyon	Rancho Seco	San Onofre			
<b>Amphibians</b>	<i>Rana pretiosa</i>		Spotted frog	C	1
Trojan					
<b>Arachnids</b>	<i>Microhexura montivaga</i>		Spider, spruce-fir moss	E	4
Catawba	McGuire	Oconee	Watts Bar		
<b>Birds</b>	<i>Ammodramus maritimus mirabilis</i>		Sparrow, Cape Sable seaside	E	1
Turkey Point					
<b>Birds</b>	<i>Ammodramus savannarum</i>		Sparrow, Florida grasshopper	E	3
Crystal River	St. Lucie	Turkey Point			
<b>Birds</b>	<i>Amphispiza belli clementeae</i>		Sparrow, San Clemente sage	T	1
San Onofre					
<b>Birds</b>	<i>Aphelocoma coerulescens</i>		Jay, Florida scrub	T	3
Crystal River	St. Lucie	Turkey Point			
<b>Birds</b>	<i>Brachyramphus marmoratus</i>		Murrelet, marbled	T	4
Diablo Canyon	San Onofre	Trojan	WNP-2		
<b>Birds</b>	<i>Branta canadensis leucopareia</i>		Goose, Aleutian Canada	T	5
Diablo Canyon	Rancho Seco	San Onofre	Trojan	WNP-2	
<b>Birds</b>	<i>Campephilus principalis</i>		Woodpecker, ivory-billed	E	2
St. Lucie	Turkey Point				
<b>Birds</b>	<i>Caracara cheriway audubonii</i>		Caracara, Audobon's crested	T	3
Crystal River	St. Lucie	Turkey Point			
<b>Birds</b>	<i>Charadrius alexandrinus nivosus</i>		Plover, western snowy	T	4
Diablo Canyon	San Onofre	South Texas	Trojan		
<b>Birds</b>	<i>Charadrius melodus</i>		Plover, piping	E,T	43
Big Rock Point	Braidwood	Browns Ferry	Brunswick	Byron	Calvert Cliffs
Comanche Peak	Cook	Cooper	Crystal River	Davis-Besse	Dresden
Farley	Fitzpatrick	Fort Calhoun	Ginna	Haddam Neck	Hatch
Hope Creek	Indian Point	Kewaunee	LaSalle	Limerick	Maine Yankee
Millstone	Nine Mile Point	Oyster Creek	Palisades	Perry	Pilgrim
Point Beach	River Bend	Robinson	Salem	Seabrook	Shoreham
South Texas	St. Lucie	Surry	Turkey Point	Vogle	Waterford
Zion					

Class	Species		Common Name		Status # Sites:
<b>Birds</b>	<i>Charadrius montanus</i>		<b>Mountain plover</b>		<b>C 2</b>
Rancho Seco	South Texas				
<b>Birds</b>	<i>Colinus virginianus ridgwayi</i>		<b>Bobwhite, masked (quail)</b>		<b>E 1</b>
Palo Verde					
<b>Birds</b>	<i>Dendroica chrysoparia</i>		<b>Warbler, golden-cheeked</b>		<b>E 2</b>
Comanche Peak	South Texas				
<b>Birds</b>	<i>Dendroica kirtlandii</i>		<b>Warbler, Kirtland's</b>		<b>E 5</b>
Beaver Valley	Davis-Besse	Hatch	LaCrosse	St. Lucie	
<b>Birds</b>	<i>Empidonax traillii extimus</i>		<b>Flycatcher, southwestern willow</b>		<b>E 3</b>
Palo Verde	San Onofre	WNP-2			
<b>Birds</b>	<i>Falco peregrinus</i>		<b>Falcon, Peregrine</b>		<b>E 66</b>
Arnold	Beaver Valley	Big Rock Point	Braidwood	Brunswick	Byron
Callaway	Calvert Cliffs	Catawba	Comanche Peak	Cook	Cooper
Davis-Besse	Diablo Canyon	Dresden	Fermi	Fort Calhoun	Fort St. Vrain
Grand Gulf	Haddam Neck	Hatch	Hope Creek	Indian Point	Kewaunee
LaCrosse	LaSalle	Limerick	Maine Yankee	McGuire	Millstone
Monticello	North Anna	Oconee	Oyster Creek	Palisades	Palo Verde
Peach Bottom	Perry	Pilgrim	Point Beach	Prairie Island	Quad Cities
Rancho Seco	River Bend	Robinson	Salem	San Onofre	Seabrook
Sequoyah	Shoreham	South Texas	St. Lucie	Summer	Surry
Susquehanna	Three Mile Island	Trojan	Turkey Point	Vermont Yankee	Vogtle
Waterford	Watts Bar	WNP-2	Wolf Creek	Yankee Rowe	Zion
<b>Birds</b>	<i>Glaucidium brasilianum cactorum</i>		<b>Cactus ferruginous pygmy-owl</b>		<b>PE 1</b>
Palo Verde					
<b>Birds</b>	<i>Grus americana</i>		<b>Crane, whooping</b>		<b>E 6</b>
Comanche Peak	Cooper	Hatch	South Texas	Vogtle	Wolf Creek
<b>Birds</b>	<i>Gymnogyps californianus</i>		<b>Condor, California</b>		<b>E 2</b>
Diablo Canyon	San Onofre				
<b>Birds</b>	<i>Haliaeetus leucocephalus</i>		<b>Eagle, bald</b>		<b>T 75</b>
Arkansas	Arnold	Beaver Valley	Big Rock Point	Braidwood	Browns Ferry
Brunswick	Byron	Callaway	Calvert Cliffs	Catawba	Clinton
Comanche Peak	Cook	Cooper	Crystal River	Davis-Besse	Diablo Canyon
Dresden	Farley	Fermi	Fitzpatrick	Fort Calhoun	Fort St. Vrain
Ginna	Grand Gulf	Haddam Neck	Harris	Hatch	Hope Creek
Indian Point	Kewaunee	LaCrosse	LaSalle	Limerick	Maine Yankee
McGuire	Millstone	Monticello	Nine Mile Point	North Anna	Oconee
Oyster Creek	Palisades	Palo Verde	Peach Bottom	Perry	Pilgrim
Point Beach	Prairie Island	Quad Cities	Rancho Seco	River Bend	Robinson
Salem	San Onofre	Seabrook	Sequoyah	Shoreham	South Texas
St. Lucie	Summer	Surry	Susquehanna	Three Mile Island	Trojan
Turkey Point	Vermont Yankee	Vogtle	Waterford	Watts Bar	WNP-2
Wolf Creek	Yankee Rowe	Zion			
<b>Birds</b>	<i>Lanius ludovicianus mearnsi</i>		<b>Shrike, San Clemente loggerhead</b>		<b>E 1</b>
San Onofre					
<b>Birds</b>	<i>Mycteria americana</i>		<b>Stork, wood</b>		<b>E 13</b>
Browns Ferry	Brunswick	Comanche Peak	Crystal River	Farley	Grand Gulf
Hatch	Robinson	Sequoyah	St. Lucie	Summer	Turkey Point
Vogtle					
<b>Birds</b>	<i>Numenius borealis</i>		<b>Curlew, Eskimo</b>		<b>E 5</b>
Hope Creek	Oyster Creek	Pilgrim	Salem	South Texas	

Class	Species		Common Name		Status # Sites:
<b>Birds</b>	<i>Pelecanus occidentalis</i>		<b>Pelican, brown</b>		<b>E 7</b>
Diablo Canyon Waterford	Palo Verde	River Bend	San Onofre	South Texas	Trojan
<b>Birds</b>	<i>Picoides borealis</i>		<b>Woodpecker, red-cockaded</b>		<b>E 23</b>
Arkansas Farley Oconee Surry	Browns Ferry Grand Gulf River Bend Turkey Point	Brunswick Harris Robinson Vogtle	Catawba Hatch Sequoyah Waterford	Comanche Peak McGuire St. Lucie Watts Bar	Crystal River North Anna Summer
<b>Birds</b>	<i>Polioptila californica californica</i>		<b>Gnatcatcher, coastal California</b>		<b>T 1</b>
San Onofre					
<b>Birds</b>	<i>Rallus longirostris levipes</i>		<b>Rail, light-footed clapper</b>		<b>E 2</b>
Diablo Canyon	San Onofre				
<b>Birds</b>	<i>Rallus longirostris obsoletus</i>		<b>Rail, California clapper</b>		<b>E 1</b>
Diablo Canyon					
<b>Birds</b>	<i>Rallus longirostris yumanensis</i>		<b>Rail, Yuma clapper</b>		<b>E 2</b>
Palo Verde	San Onofre				
<b>Birds</b>	<i>Rostrhamus sociabilis plumbeus</i>		<b>Kite, Everglade snail</b>		<b>E 3</b>
Crystal River	St. Lucie Turkey Point				
<b>Birds</b>	<i>Sterna antillarum</i>		<b>Tern, least</b>		<b>E 8</b>
Arkansas Turkey Point	Callaway Wolf Creek	Comanche Peak	Cooper	Fort Calhoun	Grand Gulf
<b>Birds</b>	<i>Sterna antillarum brownii</i>		<b>Tern, least</b>		<b>E 3</b>
Diablo Canyon	Grand Gulf	San Onofre			
<b>Birds</b>	<i>Sterna dougallii dougallii</i>		<b>Tern, roseate</b>		<b>E,T 8</b>
Haddam Neck St. Lucie	Indian Point Turkey Point	Millstone	Pilgrim	Seabrook	Shoreham
<b>Birds</b>	<i>Strix occidentalis caurina</i>		<b>Owl, northern spotted</b>		<b>T 2</b>
Trojan	WNP-2				
<b>Birds</b>	<i>Strix occidentalis lucida</i>		<b>Owl, Mexican spotted</b>		<b>T 1</b>
Palo Verde					
<b>Birds</b>	<i>Tympanuchus cupido attwateri</i>		<b>Prairie-chicken, Attwater's</b>		<b>E 1</b>
South Texas					
<b>Birds</b>	<i>Vermivora bachmanii</i>		<b>Warbler, Bachman's</b>		<b>E 6</b>
Farley	Grand Gulf	Harris	Hatch	St. Lucie	Turkey Point
<b>Birds</b>	<i>Vireo atricapillus</i>		<b>Vireo, black-capped</b>		<b>E 2</b>
Comanche Peak	South Texas				
<b>Birds</b>	<i>Vireo bellii pusillus</i>		<b>Vireo, least Bell's</b>		<b>E 2</b>
Diablo Canyon	San Onofre				
<b>Clams</b>	<i>Alasmidonta atropurpurea</i>		<b>Cumberland elktoe (mussel)</b>		<b>E 2</b>
Sequoyah	Watts Bar				
<b>Clams</b>	<i>Alasmidonta heterodon</i>		<b>Mussel, dwarf wedge</b>		<b>E 11</b>
Calvert Cliffs Salem	Harris Seabrook	Hope Creek Surry	Indian Point Vermont Yankee	North Anna Yankee Rowe	Peach Bottom
<b>Clams</b>	<i>Alasmidonta raveneliana</i>		<b>Elktoe, Appalachian</b>		<b>E 3</b>
Oconee	Sequoyah	Watts Bar			

Class	Species		Common Name		Status	# Sites:
<b>Clams</b> Browns Ferry	<i>Conradilla caelata</i>		Pearlymussel, birdwing		E	1
<b>Clams</b> Beaver Valley Quad Cities	Big Rock Point Sequoyah	Browns Ferry Vogle	Byron Watts Bar	LaSalle Oconee	E	10
<b>Clams</b> Sequoyah	<i>Dromus dromas</i>		Watts Bar Pearlymussel, dromedary		E	2
<b>Clams</b> Harris	<i>Elliptio steinstansana</i>		Spiny mussel, Tar River		E	1
<b>Clams</b> Watts Bar	<i>Epioblasma brevidens</i>		Cumberlandian combshell		E	1
<b>Clams</b> Browns Ferry	<i>Epioblasma capsaeformis</i>		Watts Bar Oyster mussel		E	2
<b>Clams</b> Browns Ferry	<i>Epioblasma florentina curtisi</i>		Pearlymussel, Curtis'		E	1
<b>Clams</b> Sequoyah	<i>Epioblasma florentina florentina</i>		Watts Bar Pearlymussel, yellow-blossom		E	2
<b>Clams</b> Browns Ferry	<i>Epioblasma metastriata</i>		Sequoyah Watts Bar Combshell, upland		E	3
<b>Clams</b> Perry	<i>Epioblasma obliquata obliquata</i>		Pearlymussel, purple cat's paw		E	1
<b>Clams</b> Sequoyah	<i>Epioblasma othcaloogensis</i>		Watts Bar Acornshell, southern		E	2
<b>Clams</b> Browns Ferry	<i>Epioblasma penita</i>		Combshell, southern (=penitent)		E	1
<b>Clams</b> Big Rock Point	<i>Epioblasma sulcata delicata</i>		Fermi LaSalle Pearlymussel, White cat's paw		E	3
<b>Clams</b> Beaver Valley	<i>Epioblasma torulosa rangiana</i>		Davis-Besse Fermi Perry Riffleshell, Northern		E	4
<b>Clams</b> Big Rock Point	<i>Epioblasma torulosa torulosa</i>		Cook LaSalle Palisades Pearlymussel, tubercled-blossom		E	4
<b>Clams</b> Browns Ferry	<i>Epioblasma walkeri</i>		Watts Bar Riffleshell, tan		E	2
<b>Clams</b> Browns Ferry	<i>Fusconata cuneolus</i>		Sequoyah Watts Bar Pigtoe, fine-rayed		E	3
<b>Clams</b> Browns Ferry	<i>Fusconata edgariana</i>		Sequoyah Pigtoe, shiny		E	2
<b>Clams</b> Browns Ferry	<i>Hemistena lata</i>		Pearlymussel, cracking		E	1
<b>Clams</b> Browns Ferry	<i>Lampsilis altilis</i>		Sequoyah Watts Bar Pocketbook, fine-lined		T	3
<b>Clams</b> Arnold Quad Cities	Byron	Callaway	LaCrosse	Monticello Prairie Island	E	7

Class	Species		Common Name		Status	# Sites:
<b>Clams</b>	<i>Lampsilis orbiculata</i>		<b>Pearlymussel, pink mucket</b>		<b>E</b>	<b>7</b>
Arkansas Watts Bar	Beaver Valley	Browns Ferry	Callaway	Farley	Sequoyah	
<b>Clams</b>	<i>Lampsilis perovalis</i>		<b>Mucket, orange-nacre</b>		<b>T</b>	<b>1</b>
Browns Ferry						
<b>Clams</b>	<i>Lampsilis powelli</i>		<b>Fatmucket, Arkansas</b>		<b>T</b>	<b>1</b>
Arkansas						
<b>Clams</b>	<i>Lampsilis streckeri</i>		<b>Pocketbook, speckled</b>		<b>E</b>	<b>1</b>
Arkansas						
<b>Clams</b>	<i>Lampsilis virescens</i>		<b>Lampmussel, Alabama</b>		<b>E</b>	<b>3</b>
Browns Ferry	Sequoyah	Watts Bar				
<b>Clams</b>	<i>Lasmigona decorata</i>		<b>Heelsplitter, Carolina</b>		<b>E</b>	<b>4</b>
Catawba	McGuire	Robinson	Summer			
<b>Clams</b>	<i>Margaritifera hembeli</i>		<b>Pearlshell, Louisiana</b>		<b>T</b>	<b>1</b>
River Bend						
<b>Clams</b>	<i>Medionidus acutissimus</i>		<b>Moccasinshell, Alabama</b>		<b>T</b>	<b>3</b>
Browns Ferry	Sequoyah	Watts Bar				
<b>Clams</b>	<i>Medionidus parvulus</i>		<b>Moccasinshell, Coosa</b>		<b>E</b>	<b>3</b>
Browns Ferry	Sequoyah	Watts Bar				
<b>Clams</b>	<i>Obovaria retusa</i>		<b>Mussel, ring pink (=golf stick</b>		<b>E</b>	<b>3</b>
Beaver Valley	Browns Ferry	LaSalle				
<b>Clams</b>	<i>Pegias fabula</i>		<b>Pearlymussel, little-wing</b>		<b>E</b>	<b>3</b>
Oconee	Sequoyah	Watts Bar				
<b>Clams</b>	<i>Plethobasus cicatricosus</i>		<b>Pearlymussel, white wartyback</b>		<b>E</b>	<b>4</b>
Braidwood	Browns Ferry	Clinton	LaSalle			
<b>Clams</b>	<i>Plethobasus cooperianus</i>		<b>Pearlymussel, orange-foot</b>		<b>E</b>	<b>4</b>
Beaver Valley	Browns Ferry	Sequoyah	Watts Bar			
<b>Clams</b>	<i>Pleurobema clava</i>		<b>Clubshell</b>		<b>E</b>	<b>8</b>
Beaver Valley Palisades	Big Rock Point Perry	Cook	Davis-Besse	Fermi	LaSalle	
<b>Clams</b>	<i>Pleurobema collina</i>		<b>Spinymussel, James River</b>		<b>E</b>	<b>2</b>
North Anna	Surry					
<b>Clams</b>	<i>Pleurobema decisum</i>		<b>Clubshell, southern</b>		<b>E</b>	<b>3</b>
Browns Ferry	Sequoyah	Watts Bar				
<b>Clams</b>	<i>Pleurobema furvum</i>		<b>Pigtoe, dark</b>		<b>E</b>	<b>1</b>
Browns Ferry						
<b>Clams</b>	<i>Pleurobema georgianum</i>		<b>Pigtoe, southern</b>		<b>E</b>	<b>2</b>
Sequoyah	Watts Bar					
<b>Clams</b>	<i>Pleurobema gibberum</i>		<b>Pigtoe, Cumberland (=Cumberland</b>		<b>E</b>	<b>2</b>
Sequoyah	Watts Bar					
<b>Clams</b>	<i>Pleurobema perovatum</i>		<b>Clubshell, ovate</b>		<b>E</b>	<b>3</b>
Browns Ferry	Sequoyah	Watts Bar				
<b>Clams</b>	<i>Pleurobema plenum</i>		<b>Pigtoe, rough</b>		<b>E</b>	<b>5</b>
Beaver Valley	Browns Ferry	LaSalle	Sequoyah	Watts Bar		



Class	Species		Common Name		Status	# Sites:
<b>Clams</b> Browns Ferry	<i>Pleurobema taitianum</i>		Pigtoe, heavy (=Judge Tait's		E	1
<b>Clams</b> Arnold	<i>Potamilus capax</i> Byron	Callaway	Pocketbook, fat Quad Cities		E	4
<b>Clams</b> River Bend	<i>Potamilus inflatus</i> Waterford		Heelsplitter, inflated		T	2
<b>Clams</b> Browns Ferry	<i>Ptychobranhus greeni</i> Sequoyah		Kidneyshell, triangular Watts Bar		E	3
<b>Clams</b> Monticello	<i>Quadrula fragosa</i> Prairie Island		Mussel, winged mapleleaf		E	2
<b>Clams</b> Browns Ferry	<i>Quadrula intermedia</i> Sequoyah		Pearlymussel, Cumberland		E	2
<b>Clams</b> Browns Ferry	<i>Toxolasma cylindrellus</i> Sequoyah		Pearlymussel, pale lilliput		E	2
<b>Clams</b> Sequoyah	<i>Villosa perpurpurea</i> Watts Bar		Purple bean (=Fine-rayed purple		E	2
<b>Clams</b> Sequoyah	<i>Villosa trabalis</i> Watts Bar		Pearlymussel, Cumberland bean		E	2
<b>Crustaceans</b> North Anna	<i>Antrolana lira</i>		Isopod, Madison Cave		T	1
<b>Crustaceans</b> Diablo Canyon	<i>Branchinecta longiantenna</i>		Fairy shrimp, longhorn		E	1
<b>Crustaceans</b> Diablo Canyon	<i>Branchinecta lynchi</i> Rancho Seco	San Onofre	Fairy shrimp, vernal pool		T	3
<b>Crustaceans</b> San Onofre	<i>Branchinecta sandiegoensis</i>		San Diego fairy shrimp		E	1
<b>Crustaceans</b> Arkansas	<i>Cambarus zophonastes</i>		Crayfish, cave [no common name]		E	1
<b>Crustaceans</b> Diablo Canyon	<i>Lepidurus packardii</i> Rancho Seco		Tadpole shrimp, vernal pool		E	2
<b>Crustaceans</b> Crystal River	<i>Palaemonetes cummingsi</i>		Shrimp, Squirrel Chimney Cave		T	1
<b>Crustaceans</b> Browns Ferry	<i>Palaemonias alabamiae</i>		Shrimp, Alabama cave		E	1
<b>Crustaceans</b> San Onofre	<i>Streptocephalus woottoni</i>		Fairy shrimp, Riverside		E	1
<b>Crustaceans</b> Calvert Cliffs	<i>Stygobromus hayi</i>		Amphipod, Hay's Spring		E	1
<b>Crustaceans</b> South Texas	<i>Stygobromus pecki</i>		Peck's cave amphipod		PE	1
<b>Fishes</b> Brunswick Hatch Millstone Seabrook	<i>Acipenser brevirostrum</i> Calvert Cliffs Hope Creek Oyster Creek Shoreham		Catawba Indian Point Peach Bottom St. Lucie	Crystal River Limerick Pilgrim Summer	Haddam Neck Maine Yankee Robinson Surry	Harris McGuire Salem Susquehanna

Class	Species	Common Name	Status	# Sites:
Three Mile Island	Turkey Point	Vermont Yankee	Vogtle	Yankee Rowe
<b>Fishes</b>	<i>Acipenser oxyrhynchus desotoi</i>	<b>Sturgeon, Gulf</b>	<b>T</b>	<b>6</b>
Crystal River	Farley	Grand Gulf	River Bend	St. Lucie
				Waterford
<b>Fishes</b>	<i>Crystallaria asprella</i>			<b>1</b>
Callaway				
<b>Fishes</b>	<i>Cyprinella caerulea</i>	<b>Shiner, blue</b>	<b>T</b>	<b>2</b>
Sequoyah	Watts Bar			
<b>Fishes</b>	<i>Cyprinodon macularius</i>	<b>Pupfish, desert</b>	<b>E</b>	<b>2</b>
Palo Verde	San Onofre			
<b>Fishes</b>	<i>Etheostoma boschungii</i>	<b>Darter, slackwater</b>	<b>T</b>	<b>1</b>
Browns Ferry				
<b>Fishes</b>	<i>Etheostoma etowahae</i>	<b>Darter, Etowah</b>	<b>E</b>	<b>1</b>
Sequoyah				
<b>Fishes</b>	<i>Etheostoma fonticola</i>	<b>Darter, fountain</b>	<b>E</b>	<b>1</b>
South Texas				
<b>Fishes</b>	<i>Etheostoma nianguae</i>	<b>Darter, Niangua</b>	<b>T</b>	<b>1</b>
Callaway				
<b>Fishes</b>	<i>Etheostoma nuchale</i>	<b>Darter, watercress</b>	<b>E</b>	<b>1</b>
Browns Ferry				
<b>Fishes</b>	<i>Etheostoma okaloosae</i>	<b>Darter, Okaloosa</b>	<b>E</b>	<b>1</b>
Farley				
<b>Fishes</b>	<i>Etheostoma rubrum</i>	<b>Darter, bayou</b>	<b>T</b>	<b>1</b>
Grand Gulf				
<b>Fishes</b>	<i>Etheostoma sellare</i>	<b>Darter, Maryland</b>	<b>E</b>	<b>6</b>
Calvert Cliffs	Hope Creek	Limerick	Peach Bottom	Salem
				Three Mile Island
<b>Fishes</b>	<i>Etheostoma sp. (Cherokee)</i>	<b>Darter, Cherokee</b>	<b>T</b>	<b>1</b>
Sequoyah				
<b>Fishes</b>	<i>Etheostoma sp. (Duskytail)</i>	<b>Darter, duskytail</b>	<b>E</b>	<b>2</b>
Sequoyah	Watts Bar			
<b>Fishes</b>	<i>Etheostoma (wapiti)</i>	<b>Darter, boulder (=Elk River)</b>	<b>E</b>	<b>1</b>
Browns Ferry				
<b>Fishes</b>	<i>Eucyclogobius newberryi</i>	<b>Goby, tidewater</b>	<b>E</b>	<b>2</b>
Diablo Canyon	San Onofre			
<b>Fishes</b>	<i>Gasterosteus aculeatus williamsoni</i>	<b>Stickleback, unarmored</b>	<b>E</b>	<b>2</b>
Diablo Canyon	San Onofre			
<b>Fishes</b>	<i>Gila bicolor mohavensis</i>	<b>Chub, Mohave tui</b>	<b>E</b>	<b>1</b>
San Onofre				
<b>Fishes</b>	<i>Gila elegans</i>	<b>Chub, bonytail</b>	<b>E</b>	<b>1</b>
San Onofre				
<b>Fishes</b>	<i>Hybopsis monacha</i>	<b>Chub, spotfin (=turquoise shiner)</b>	<b>T</b>	<b>4</b>
Browns Ferry	Oconee	Sequoyah	Watts Bar	
<b>Fishes</b>	<i>Hypomesus transpacificus</i>	<b>Smelt, delta</b>	<b>T</b>	<b>1</b>
Rancho Seco				
<b>Fishes</b>	<i>Macrhybopsis gelida</i>	<b>Sturgeon chub</b>	<b>C</b>	<b>3</b>
Callaway	Cooper	Fort Calhoun		



Class	Species	Common Name	Status	# Sites:
<b>Fishes</b>	<i>Macrhybopsis meeki</i>	Sicklefin chub	C	3
Callaway	Cooper	Fort Calhoun		
<b>Fishes</b>	<i>Meda fulgida</i>	Spikedace	T	1
Palo Verde				
<b>Fishes</b>	<i>Menidia extensa</i>	Silverside, Waccamaw	T	1
Brunswick				
<b>Fishes</b>	<i>Notropis mekistocholas</i>	Shiner, Cape Fear	E	3
Harris	McGuire	Robinson		
<b>Fishes</b>	<i>Noturus baileyi</i>	Madtom, smoky	E	2
Sequoyah	Watts Bar			
<b>Fishes</b>	<i>Noturus flavipinnis</i>	Madtom, yellowfin	T	2
Sequoyah	Watts Bar			
<b>Fishes</b>	<i>Noturus placidus</i>	Madtom, Neosho	T	1
Wolf Creek				
<b>Fishes</b>	<i>Oncorhynchus kisutch</i>	Salmon, Coho	E	1
Trojan				
<b>Fishes</b>	<i>Oncorhynchus nerka</i>	Salmon, sockeye (=red, =blueback)	E	2
Trojan	WNP-2			
<b>Fishes</b>	<i>Oncorhynchus tshawytscha</i>	Salmon, chinook	E,T	3
Rancho Seco	Trojan	WNP-2		
<b>Fishes</b>	<i>Oregonichthys crameri</i>	Chub, Oregon	E	1
Trojan				
<b>Fishes</b>	<i>Percina antesella</i>	Darter, amber	E	3
Oconee	Sequoyah	Watts Bar		
<b>Fishes</b>	<i>Percina aurolineata</i>	Darter, goldline	T	2
Sequoyah	Watts Bar			
<b>Fishes</b>	<i>Percina jenkinsi</i>	Logperch, Conasauga	E	2
Sequoyah	Watts Bar			
<b>Fishes</b>	<i>Percina pantherina</i>	Darter, leopard	T	1
Arkansas				
<b>Fishes</b>	<i>Percina rex</i>	Logperch, Roanoke	E	2
North Anna	Surry			
<b>Fishes</b>	<i>Percina tanasi</i>	Darter, snail	T	3
Browns Ferry	Sequoyah	Watts Bar		
<b>Fishes</b>	<i>Phoxinus cumberlandensis</i>	Dace, blackside	T	1
Watts Bar				
<b>Fishes</b>	<i>Poeciliopsis occidentalis</i>	Topminnow, Gila (incl. Yaqui)	E	1
Palo Verde				
<b>Fishes</b>	<i>Pogonichthys macrolepidotus</i>	Sacramento splittail	PT	1
Rancho Seco				
<b>Fishes</b>	<i>Ptychocheilus lucius</i>	Squawfish, Colorado	E	2
Palo Verde	San Onofre			
<b>Fishes</b>	<i>Salmo aguabonita whitei</i>	Trout, Little Kern golden	T	1
Diablo Canyon				

Class	Species		Common Name		Status	# Sites:
<b>Fishes</b>	<i>Salmo clarki seleniris</i>		Trout, Paiute cutthroat		T	1
Diablo Canyon						
<b>Fishes</b>	<i>Salmo gilae</i>		Trout, Gila		E	1
Palo Verde						
<b>Fishes</b>	<i>Salmo salar</i>		Atlantic salmon (Dennys,		PT	1
Maine Yankee						
<b>Fishes</b>	<i>Salvelinus confluentus</i>		Bull trout		C	1
WNP-2						
<b>Fishes</b>	<i>Scaphirhynchus albus</i>		Sturgeon, pallid		E	7
Callaway	Cooper	Fort Calhoun	Grand Gulf	River Bend	Waterford	
Wolf Creek						
<b>Fishes</b>	<i>Speoplatyrhinus poulsoni</i>		Cavefish, Alabama		E	1
Browns Ferry						
<b>Fishes</b>	<i>Tiaroga cobitis</i>		Minnow, loach		T	1
Palo Verde						
<b>Fishes</b>	<i>Xyrauchen texanus</i>		Sucker, razorback		E	2
Palo Verde	San Onofre					
<b>Insects</b>	<i>Cicindela dorsalis dorsalis</i>		Beetle, northeastern beach tiger		T	5
Calvert Cliffs	Millstone	North Anna	Pilgrim	Surry		
<b>Insects</b>	<i>Cicindela puritana</i>		Beetle, Puritan tiger		T	11
Calvert Cliffs	Haddam Neck	Hope Creek	Limerick	Millstone	Peach Bottom	
Salem	Shoreham	Three Mile Island	Vermont Yankee	Yankee Rowe		
<b>Insects</b>	<i>Desmocerus californicus dimorphus</i>		Beetle, valley elderberry longhorn		T	2
Diablo Canyon	Rancho Seco					
<b>Insects</b>	<i>Euphilotes battoides allyni</i>		Butterfly, El Segundo blue		E	1
San Onofre						
<b>Insects</b>	<i>Euphilotes enoptes smithi</i>		Butterfly, Smith's blue		E	1
Diablo Canyon						
<b>Insects</b>	<i>Euphydryas editha quino</i>		Quino checkerspot (butterfly)		E	1
San Onofre						
<b>Insects</b>	<i>Euproserpinus euterpe</i>		Moth, Kern primrose sphinx		T	1
Diablo Canyon						
<b>Insects</b>	<i>Glaucopsyche lygdamus</i>		Butterfly, Palos Verdes blue		E	1
San Onofre						
<b>Insects</b>	<i>Heracles aristodemus ponceanus</i>		Butterfly, Schaus swallowtail		E	1
Turkey Point						
<b>Insects</b>	<i>Heterelmis comalensis</i>		Comal Springs riffle beetle		PE	1
South Texas						
<b>Insects</b>	<i>Lycaeides melissa samuelis</i>		Butterfly, Karner blue		E	17
Braidwood	Byron	Cook	Davis-Besse	Dresden	Fermi	
Kewaunee	LaCrosse	LaSalle	Monticello	Palisades	Point Beach	
Prairie Island	Seabrook	Vermont Yankee	Yankee Rowe	Zion		
<b>Insects</b>	<i>Neonympha mitchellii mitchellii</i>		Butterfly, Mitchell's satyr		E	4
Cook	Fermi	Palisades	Perry			

Class	Species		Common Name		Status	# Sites:
<b>Insects</b>	<i>Nicrophorus americanus</i>		Beetle, American burying (=giant		E	10
Arkansas	Callaway	Cooper	Fort Calhoun	Haddam Neck	Millstone	
Palisades	Pilgrim	Shoreham	Wolf Creek			
<b>Insects</b>	<i>Pyrgus ruralis lagunae</i>		Laguna Mountains skipper		E	1
San Onofre						
<b>Insects</b>	<i>Rhaphiomidas terminatus</i>		Fly, Delhi Sands flower-loving		E	1
San Onofre						
<b>Insects</b>	<i>Somatochlora hineana</i>		Dragonfly, Hine's (=Ohio) emerald		E	10
Braidwood	Byron	Cook	Davis-Besse	Dresden	Fermi	
Kewaunee	LaSalle	Point Beach	Zion			
<b>Insects</b>	<i>Speyeria zerene hippolyta</i>		Butterfly, Oregon silverspot		T	1
Trojan						
<b>Insects</b>	<i>Stygoparnus comalensis</i>		Comal Springs dryopid beetle		PE	1
South Texas						
<b>Mammals</b>	<i>Antilocapra americana sonoriensis</i>		Pronghorn, Sonoran		E	1
Palo Verde						
<b>Mammals</b>	<i>Arctocephalus townsendi</i>		Seal, guadalupe fur		T	1
Diablo Canyon						
<b>Mammals</b>	<i>Balaenoptera physalus</i>		Whale, Fin		E	1
Seabrook						
<b>Mammals</b>	<i>Canis lupus</i>		Wolf, gray		E,T	6
Fort St. Vrain	Kewaunee	Monticello	Point Beach	Trojan	WNP-2	
<b>Mammals</b>	<i>Canis rufus</i>		Wolf, red		E	5
Harris	Oconee	Sequoyah	Surry	Watts Bar		
<b>Mammals</b>	<i>Conepatus leuconotus texensis</i>		Gulf Coast hog-nosed skunk		C	1
South Texas						
<b>Mammals</b>	<i>Dipodomys heermanni morroensis</i>		Kangaroo rat, Morro Bay		E	2
Diablo Canyon	San Onofre					
<b>Mammals</b>	<i>Dipodomys ingens</i>		Kangaroo rat, giant		E	1
Diablo Canyon						
<b>Mammals</b>	<i>Dipodomys merriami parvus</i>		Kangaroo rat, San Bernadino		C	1
Diablo Canyon						
<b>Mammals</b>	<i>Dipodomys nitratoides exilis</i>		Kangaroo rat, Fresno		E	1
Diablo Canyon						
<b>Mammals</b>	<i>Dipodomys nitratoides nitratoides</i>		Kangaroo rat, Tipton		E	1
Diablo Canyon						
<b>Mammals</b>	<i>Dipodomys stephensi</i>		Kangaroo rat, Stephens'		E	1
San Onofre						
<b>Mammals</b>	<i>Enhydra lutris nereis</i>		Otter, Southern sea		T	2
Diablo Canyon	San Onofre					
<b>Mammals</b>	<i>Eschrichtius robustus</i>		Whale, Gray		E	1
Diablo Canyon						
<b>Mammals</b>	<i>Eubalaena glacialis</i>		Whale, Right		E	1
Pilgrim						



Class	Species		Common Name		Status	# Sites:
<b>Mammals</b>	<i>Felis concolor coryi</i>		<b>Panther, Florida</b>		<b>E</b>	<b>3</b>
Farley	St. Lucie	Turkey Point				
<b>Mammals</b>	<i>Felis concolor cougar</i>		<b>Cougar, eastern</b>		<b>E</b>	<b>23</b>
Beaver Valley	Browns Ferry	Brunswick	Catawba	Haddam Neck	Harris	
Indian Point	Maine Yankee	McGuire	Millstone	North Anna	Oconee	
Perry	Pilgrim	Robinson	Seabrook	Sequoyah	Summer	
Surry	Vermont Yankee	Vogtle	Watts Bar	Yankee Rowe		
<b>Mammals</b>	<i>Felis pardalis</i>		<b>Ocelot</b>		<b>E</b>	<b>1</b>
South Texas						
<b>Mammals</b>	<i>Felis yagouaroundi tolteca</i>		<b>Jaguarundi</b>		<b>E</b>	<b>1</b>
South Texas						
<b>Mammals</b>	<i>Glaucomys sabrinus coloratus</i>		<b>Squirrel, Carolina northern flying</b>		<b>E</b>	<b>4</b>
McGuire	Oconee	Sequoyah	Watts Bar			
<b>Mammals</b>	<i>Leptonycteris sanborni yerbabuenae</i>		<b>Bat, lesser (=Sanborn's)</b>		<b>E</b>	<b>1</b>
Palo Verde						
<b>Mammals</b>	<i>Megaptera novaeangliae</i>		<b>Whale, Humpback</b>		<b>E</b>	<b>2</b>
Pilgrim	Seabrook					
<b>Mammals</b>	<i>Microtus californicus scirpensis</i>		<b>Vole, Amargosa</b>		<b>E</b>	<b>1</b>
San Onofre						
<b>Mammals</b>	<i>Microtus pennsylvanicus</i>		<b>Vole, Florida salt marsh</b>		<b>E</b>	<b>1</b>
Crystal River						
<b>Mammals</b>	<i>Myotis grisescens</i>		<b>Bat, gray</b>		<b>E</b>	<b>9</b>
Arkansas	Browns Ferry	Callaway	Farley	Oconee	Sequoyah	
Vogtle	Watts Bar	Wolf Creek				
<b>Mammals</b>	<i>Myotis sodalis</i>		<b>Bat, Indiana</b>		<b>E</b>	<b>47</b>
Arkansas	Arnold	Beaver Valley	Big Rock Point	Braidwood	Browns Ferry	
Byron	Callaway	Calvert Cliffs	Catawba	Clinton	Cook	
Cooper	Davis-Besse	Dresden	Farley	Fermi	Fitzpatrick	
Fort Calhoun	Ginna	Haddam Neck	Hope Creek	Indian Point	LaSalle	
Limerick	McGuire	Millstone	Nine Mile Point	North Anna	Oconee	
Oyster Creek	Palisades	Peach Bottom	Perry	Pilgrim	Quad Cities	
Salem	Seabrook	Sequoyah	Shoreham	Summer	Susquehanna	
Three Mile Island	Vermont Yankee	Watts Bar	Yankee Rowe	Zion		
<b>Mammals</b>	<i>Neotoma floridana smalli</i>		<b>Woodrat, Key Largo</b>		<b>E</b>	<b>1</b>
Turkey Point						
<b>Mammals</b>	<i>Neotoma fuscipes riparia</i>		<b>San Joaquin Valley woodrat</b>		<b>C</b>	<b>1</b>
Rancho Seco						
<b>Mammals</b>	<i>Odocoileus virginianus clavium</i>		<b>Deer, key</b>		<b>E</b>	<b>1</b>
Turkey Point						
<b>Mammals</b>	<i>Odocoileus virginianus leucurus</i>		<b>Deer, Columbian white-tailed</b>		<b>E</b>	<b>1</b>
Trojan						
<b>Mammals</b>	<i>Oryzomys palustris natator</i>		<b>Rice rat (=silver rice rat)</b>		<b>E</b>	<b>1</b>
Turkey Point						
<b>Mammals</b>	<i>Perognathus longimembris</i>		<b>Mouse, Pacific pocket</b>		<b>E</b>	<b>1</b>
San Onofre						
<b>Mammals</b>	<i>Peromyscus gossypinus allapaticola</i>		<b>Mouse, Key Largo cotton</b>		<b>E</b>	<b>1</b>
Turkey Point						

Class	Species	Common Name	Status	# Sites:
Mammals	<i>Peromyscus polionotus allophrys</i>	Mouse, Choctawahatchee beach	E	1
Farley				
Mammals	<i>Peromyscus polionotus niveiventris</i>	Mouse, southeastern beach	T	1
St. Lucie				
Mammals	<i>Peromyscus polionotus peninsularis</i>	St. Andrews beach mouse	C	1
St. Lucie				
Mammals	<i>Phoca vitulina</i>	Seal, Harbor	MMP	1
San Onofre				
Mammals	<i>Plecotus townsendii ingens</i>	Bat, Ozark big-eared	E	1
Arkansas				
Mammals	<i>Plecotus townsendii virginianus</i>	Bat, Virginia big-eared	E	3
Hatch	McGuire	North Anna		
Mammals	<i>Sciurus niger cinereus</i>	Squirrel, Delmarva Peninsula fox	E	8
Calvert Cliffs	Hope Creek	Limerick		
Surry	Three Mile Island	North Anna	Peach Bottom	Salem
Mammals	<i>Sorex longirostris fisheri</i>	Shrew, Dismal Swamp	T	1
Surry				
Mammals	<i>Sorex ornatus relictus</i>	Buena Vista Lake ornate shrew	C	1
Diablo Canyon				
Mammals	<i>Sylvilagus bachmani riparius</i>	Riparian brush rabbit	C	3
Diablo Canyon	Rancho Seco	San Onofre		
Mammals	<i>Sylvilagus palustris hefneri</i>	Rabbit, Lower Keys	E	1
Turkey Point				
Mammals	<i>Trichechus manatus</i>	Manatee, West Indian (=Florida)	E	8
Brunswick	Crystal River	Farley	Hatch	South Texas
Turkey Point	Vogtle			St. Lucie
Mammals	<i>Ursus americanus</i>	Bear, American black	T,SA	2
Grand Gulf	River Bend			
Mammals	<i>Ursus americanus floridanus</i>	Florida black bear	C	3
St. Lucie	Turkey Point	Vogtle		
Mammals	<i>Ursus americanus luteolus</i>	Bear, Louisiana black	T	4
Grand Gulf	River Bend	South Texas	Waterford	
Mammals	<i>Ursus arctos</i>	Bear, grizzly (=brown)	T	2
Trojan	WNP-2			
Mammals	<i>Vulpes macrotis mutica</i>	Fox, San Joaquin kit	E	3
Diablo Canyon	Rancho Seco	San Onofre		
Mammals	<i>Zalophus californicus</i>	Sealion, Colifornia	MMP	1
San Onofre				
Plants	<i>Aconitum noveboracense</i>	Northern wild monkshood	T	7
Arnold	Beaver Valley	Byron	Indian Point	LaCrosse
Quad Cities				Perry
Plants	<i>Aeschynomene virginica</i>	Sensitive joint-vetch	T	8
Calvert Cliffs	Hope Creek	Limerick	North Anna	Oyster Creek
Salem	Surry			Peach Bottom

Class	Species		Common Name		Status # Sites:
<b>Plants</b>	<i>Agalinis acuta</i>		<b>Sandplain gerardia</b>		<b>E 13</b>
Calvert Cliffs	Haddam Neck	Hope Creek	Indian Point	Limerick	Millstone
Oyster Creek	Peach Bottom	Pilgrim	Salem	Seabrook	Shoreham
Three Mile Island					
<b>Plants</b>	<i>Agave arizonica</i>		<b>Arizona agave</b>		<b>E 1</b>
Palo Verde					
<b>Plants</b>	<i>Allium munzii</i>		<b>Onion, Munz's</b>		<b>PE 1</b>
San Onofre					
<b>Plants</b>	<i>Allium tuolumnense</i>		<b>Onion, Rawhide Hill</b>		<b>PT 1</b>
Diablo Canyon					
<b>Plants</b>	<i>Amaranthus pumilus</i>		<b>Seabeach amaranth</b>		<b>T 9</b>
Brunswick	Calvert Cliffs	Haddam Neck	Indian Point	Millstone	Oyster Creek
Robinson	Shoreham	Surry			
<b>Plants</b>	<i>Ambrosia cheiranthifolia</i>		<b>South Texas ambrosia</b>		<b>E 1</b>
South Texas					
<b>Plants</b>	<i>Amorpha crenulata</i>		<b>Crenulate lead-plant</b>		<b>E 1</b>
Turkey Point					
<b>Plants</b>	<i>Amphianthus pusillus</i>		<b>Little amphianthus</b>		<b>T 6</b>
Catawba	McGuire	Oconee	Robinson	Summer	Vogtle
<b>Plants</b>	<i>Amsonia kearneyana</i>		<b>Kearney's blue-star</b>		<b>E 1</b>
Palo Verde					
<b>Plants</b>	<i>Apios priceana</i>		<b>Price's potato-bean</b>		<b>T 3</b>
Browns Ferry	Sequoyah	Watts Bar			
<b>Plants</b>	<i>Arabis serotina</i>		<b>Shale barren rock-cress</b>		<b>E 1</b>
North Anna					
<b>Plants</b>	<i>Arctostaphylos glandulosa</i>		<b>Manzanita, Del Mar (=Costa Baja,</b>		<b>E 1</b>
Diablo Canyon					
<b>Plants</b>	<i>Arctostaphylos morroensis</i>		<b>Manzanita, Morro</b>		<b>T 1</b>
Diablo Canyon					
<b>Plants</b>	<i>Arenaria cumberlandensis</i>		<b>Cumberland sandwort</b>		<b>E 2</b>
Sequoyah	Watts Bar				
<b>Plants</b>	<i>Arenaria paludicola</i>		<b>Marsh sandwort</b>		<b>E 2</b>
Diablo Canyon	San Onofre				
<b>Plants</b>	<i>Asclepias meadii</i>		<b>Mead's milkweed</b>		<b>T 5</b>
Braidwood	Clinton	Dresden	LaSalle	Wolf Creek	
<b>Plants</b>	<i>Asimina tetramera</i>		<b>Four-petal pawpaw</b>		<b>E 1</b>
St. Lucie					
<b>Plants</b>	<i>Astragalus albens</i>		<b>Cushenbury milk-vetch</b>		<b>E 1</b>
San Onofre					
<b>Plants</b>	<i>Astragalus jaegerianus</i>		<b>Milk-vetch, Coolgardie</b>		<b>PE 1</b>
San Onofre					
<b>Plants</b>	<i>Astragalus lentiginosus coachellae</i>		<b>Milk-vetch, Coachella Valley</b>		<b>PE 1</b>
San Onofre					
<b>Plants</b>	<i>Astragalus robbinsii jesupi</i>		<b>Jesup's milk-vetch</b>		<b>E 3</b>
Seabrook	Vermont Yankee	Yankee Rowe			



Class	Species	Common Name	Status	# Sites:
Plants San Onofre	<i>Astragalus tener titi</i>	Rattleweed, coastal dunes	PE	1
Plants San Onofre	<i>Astragalus tricarinatus</i>	Milk-vetch, triple-ribbed	PE	1
Plants San Onofre	<i>Baccharis vanessae</i>	Baccharis (=Coyote bush),	E	1
Plants Hatch	<i>Baptisia arachnifera</i>	Hairy rattleweed	E	1
Plants Braidwood Quad Cities	<i>Boltonia decurrens</i> Byron	Decurrent false aster Callaway	T Clinton	7 Dresden
Plants Crystal River	<i>Bonamia grandiflora</i> St. Lucie	Florida bonamia	T	2
Plants San Onofre	<i>Brodiaea filifolia</i>	Brodiaea, thread-leaved	PT	1
Plants Diablo Canyon	<i>Brodiaea pallida</i>	Brodiaea, Chinese Camp	PE	1
Plants Diablo Canyon	<i>Calyptridium pulchellum</i>	Pussy-paws, Mariposa	PE	1
Plants Crystal River	<i>Campanula robinsiae</i>	Brooksville (=Robins') bellflower	E	1
Plants Diablo Canyon	<i>Carpenteria californica</i>	Carpenteria	PT	1
Plants Diablo Canyon	<i>Castilleja campestris succulenta</i>	Owl's-clover, fleshy	PT	1
Plants San Onofre	<i>Castilleja grisea</i>	San Clemente Island Indian	E	1
Plants Trojan	<i>Castilleja levisecta</i>	Indian Paintbrush	PT	1
Plants Diablo Canyon	<i>Caulanthus californicus</i>	California jewelflower	E	1
Plants San Onofre	<i>Centrostegia leptoceras</i>	Slender-horned spineflower	E	1
Plants St. Lucie	<i>Cereus eriophorus fragrans</i>	Fragrant prickly-apple	E	1
Plants Turkey Point	<i>Cereus robinii</i>	Key tree-cactus	E	1
Plants Crystal River	<i>Chionanthus pygmaeus</i> St. Lucie	Pygmy fringe-tree	E	2
Plants Diablo Canyon	<i>Chlorogalum purpureum reductum</i>	Amole, Cammatta Canyon	C	1
Plants San Onofre	<i>Chorizanthe orcuttiana</i>	Spineflower, Orcutt's	E	1
Plants Diablo Canyon	<i>Chorizanthe pungens pungens</i>	Spineflower, Monterey	T	1

Class	Species	Common Name	Status	# Sites:
<b>Plants</b> Diablo Canyon	<i>Chorizanthe robusta</i>	Spineflower, Robust (incl. Scotts	E	1
<b>Plants</b> Crystal River	<i>Chrysopsis floridana</i>	Florida golden aster	E	1
<b>Plants</b> Diablo Canyon	<i>Cirsium fontinale obispoense</i>	Thistle, Chorro Creek bog	E	1
<b>Plants</b> Diablo Canyon	<i>Cirsium loncholepis</i>	Thistle, La Graciosa	C	1
<b>Plants</b> Braidwood Point Beach	<i>Cirsium pitcheri</i> Cook Zion	<b>Pitcher's thistle</b> Dresden Kewaunee LaSalle	T	8 Palisades
<b>Plants</b> Diablo Canyon	<i>Cirsium rhotophilum</i>	Thistle, surf	C	1
<b>Plants</b> St. Lucie	<i>Cladonia perforata</i>	Florida perforate cladonia	E	1
<b>Plants</b> Diablo Canyon	<i>Clarkia speciosa immaculata</i>	Clarkia, Pismo	E	1
<b>Plants</b> Diablo Canyon	<i>Clarkia springvillensis</i>	Clarkia, Springville	PT	1
<b>Plants</b> Browns Ferry	<i>Clematis morefieldii</i>	Morefield's leather-flower	E	1
<b>Plants</b> Sequoyah	<i>Clematis socialis</i>	Alabama leather-flower	E	1
<b>Plants</b> Crystal River	<i>Conradina brevifolia</i> St. Lucie	Short-leaved rosemary	E	2
<b>Plants</b> Crystal River	<i>Conradina etonia</i>	Etonia rosemary	E	1
<b>Plants</b> Farley	<i>Conradina glabra</i>	Apalachicola rosemary	E	1
<b>Plants</b> Sequoyah	<i>Conradina verticillata</i> Watts Bar	Cumberland rosemary	T	2
<b>Plants</b> Diablo Canyon	<i>Cordylanthus maritimus maritimus</i> San Onofre	Salt marsh bird's-beak	E	2
<b>Plants</b> Diablo Canyon	<i>Cordylanthus palmatus</i>	Bird's-beak, Palmate-bracted	E	1
<b>Plants</b> Palo Verde	<i>Coryphantha scheeri robustispina</i>	Pima pineapple cactus	E	1
<b>Plants</b> Crystal River	<i>Crotalaria avonensis</i> St. Lucie	Avon Park harebells	E	2
<b>Plants</b> St. Lucie	<i>Cucurbita okeechobeensis</i>	Okeechobee gourd	E	1
<b>Plants</b> Big Rock Point	<i>Cypripedium arietinum</i>			1
<b>Plants</b> Braidwood	<i>Dalea foliosa</i> Browns Ferry	<b>Leafy prairie-clover</b> Byron LaSalle	E	4



Class	Species	Common Name	Status	# Sites:
Plants San Onofre	<i>Delphinium variegatum kinkiense</i>	San Clemente Island larkspur	E	1
Plants St. Lucie	<i>Dicerandra christmanii</i>	Garrett's mint	E	1
Plants Crystal River	<i>Dicerandra cornutissima</i>	Longspurred mint	E	1
Plants St. Lucie	<i>Dicerandra frutescens</i>	Scrub mint	E	1
Plants St. Lucie	<i>Dicerandra immaculata</i>	Lakela's mint	E	1
Plants Diablo Canyon	<i>Dudleya setchellii</i> San Onofre	Santa Clara Valley dudleya	E	2
Plants Diablo Canyon	<i>Dudleya traskiae</i>	Santa Barbara Island liveforever	E	1
Plants Catawba Summer	<i>Echinacea laevigata</i> Harris Surry	Smooth coneflower McGuire Vogle North Anna Oconee Robinson	E	9
Plants Palo Verde	<i>Echinocactus horzonthalonius</i>	Nichol's Turk's head cactus	E	1
Plants South Texas	<i>Echinocereus reichenbachii albertii</i>	Black lace cactus	E	1
Plants Palo Verde	<i>Echinocereus triglochidiatus</i>	Arizona hedgehog cactus	E	1
Plants Diablo Canyon	<i>Eremalche kernensis</i>	Kern mallow	E	1
Plants San Onofre	<i>Eriastrum densifolium sanctorum</i>	Santa Ana River woolly-star	E	1
Plants Diablo Canyon	<i>Eriastrum hooveri</i>	Hoover's woolly-star	T	1
Plants San Onofre	<i>Erigeron parishii</i>	Parish's daisy	T	1
Plants Diablo Canyon	<i>Eriodictyon altissimum</i>	Mountain balm, Indian Knob	E	1
Plants Crystal River	<i>Eriogonum longifolium</i> St. Lucie	Scrub buckwheat	T	2
Plants San Onofre	<i>Eriogonum ovalifolium vineum</i>	Cushenbury buckwheat	E	1
Plants San Onofre	<i>Eryngium aristulatum parishii</i>	San Diego button-celery	E	1
Plants Crystal River	<i>Eryngium cuneifolium</i> St. Lucie Turkey Point	Snakeroot	E	3
Plants Diablo Canyon	<i>Erysimum menziesii</i>	Menzies' wallflower	E	1
Plants Monticello	<i>Erythronium propullans</i> Prairie Island	Minnesota trout lily	E	2

Class	Species		Common Name		Status	# Sites:
<b>Plants</b> Turkey Point	<i>Euphorbia deltoidea deltoidea</i>		Deltoid spurge		E	1
<b>Plants</b> Turkey Point	<i>Euphorbia garberi</i>		Garber's spurge		T	1
<b>Plants</b> Farley	<i>Euphorbia telephioides</i>		Telephus spurge		T	1
<b>Plants</b> Diablo Canyon	<i>Fritillaria striata</i>		Adobe-lily, Greenhorn		PT	1
<b>Plants</b> Turkey Point	<i>Galactia smallii</i>		Small's milkpea		E	1
<b>Plants</b> Arkansas	<i>Geocarpon minimum</i>		None		T	1
<b>Plants</b> Catawba	<i>Geum radiatum</i>	McGuire Oconee	Spreading avens		E	4
<b>Plants</b> Diablo Canyon	<i>Gilia tenuiflora arenaria</i>		Monterey gilia		E	1
<b>Plants</b> Catawba	<i>Gymnoderma lineare</i>	McGuire Oconee	Lichen, rock gnome		E	4
<b>Plants</b> St. Lucie	<i>Halophila johnsonii</i>	Turkey Point	Seagrass, Johnsons		PT	2
<b>Plants</b> Farley	<i>Harperocallis flava</i>		Harper's beauty		E	1
<b>Plants</b> McGuire	<i>Hedyotis purpurea montana</i>		Roan Mountain bluet		E	1
<b>Plants</b> Brunswick Vogtle	<i>Helianthus schweinitzii</i>	Catawba Harris	Schweinitz's sunflower		E	7
<b>Plants</b> Calvert Cliffs Oyster Creek	<i>Helonias bullata</i>	Hope Creek Indian Point Peach Bottom Salem	Swamp pink		T	12
			Limerick North Anna Summer Surry	Oconee Three Mile Island		
<b>Plants</b> Catawba	<i>Hexastylis naniflora</i>	McGuire Oconee	Dwarf-flowered heartleaf		T	4
<b>Plants</b> South Texas	<i>Hoffmannseggia tenella</i>		Slender rush-pea		E	1
<b>Plants</b> Trojan	<i>Howellia aquatilis</i>		Howellia, water		T	1
<b>Plants</b> Catawba	<i>Hudsonia montana</i>	McGuire	Mountain golden heather		T	2
<b>Plants</b> Braidwood Fermi	<i>Hymenoxys acaulis glabra</i>	Byron Clinton LaSalle Zion	Lakeside daisy		T	9
			Cook Davis-Besse	Dresden		
<b>Plants</b> South Texas	<i>Hymenoxys texana</i>		Texas prairie dawn-flower		E	1
<b>Plants</b> Crystal River	<i>Hypericum cumulicola</i>	St. Lucie	Highlands scrub hypericum		E	2

Class	Species		Common Name		Status	# Sites:
<b>Plants</b>	<b><i>Iris lacustris</i></b>		<b>Dwarf lake iris</b>		<b>T</b>	<b>2</b>
Kewaunee	Point Beach					
<b>Plants</b>	<b><i>Isoetes louisianensis</i></b>		<b>Louisiana quillwort</b>		<b>E</b>	<b>2</b>
River Bend	Waterford					
<b>Plants</b>	<b><i>Isoetes melanospora</i></b>		<b>Black-spored quillwort</b>		<b>E</b>	<b>6</b>
Catawba	McGuire	Oconee	Robinson	Summer	Vogtle	
<b>Plants</b>	<b><i>Isoetes tegetiformans</i></b>		<b>Mat-forming quillwort</b>		<b>E</b>	<b>2</b>
Oconee	Vogtle					
<b>Plants</b>	<b><i>Isotria medeoloides</i></b>		<b>Small whorled pogonia</b>		<b>T</b>	<b>29</b>
Beaver Valley	Calvert Cliffs	Catawba	Cook	Fitzpatrick	Ginna	
Haddam Neck	Hope Creek	Indian Point	Limerick	Maine Yankee	McGuire	
Millstone	Nine Mile Point	North Anna	Oconee	Palisades	Peach Bottom	
Pilgrim	Salem	Seabrook	Sequoyah	Shoreham	Surry	
Susquehanna	Three Mile Island	Vermont Yankee	Watts Bar	Yankee Rowe		
<b>Plants</b>	<b><i>Jacquemontia reclinata</i></b>		<b>Beach jacquemontia</b>		<b>E</b>	<b>2</b>
St. Lucie	Turkey Point					
<b>Plants</b>	<b><i>Justicia cooleyi</i></b>		<b>Cooley's water-willow</b>		<b>E</b>	<b>1</b>
Crystal River						
<b>Plants</b>	<b><i>Lasthenia conjugens</i></b>		<b>Goldfields, Contra Costa</b>		<b>PT</b>	<b>1</b>
Diablo Canyon						
<b>Plants</b>	<b><i>Layia carnosa</i></b>		<b>Beach layia</b>		<b>E</b>	<b>1</b>
Diablo Canyon						
<b>Plants</b>	<b><i>Lembertia congdonii</i></b>		<b>San Joaquin wooly-threads</b>		<b>E</b>	<b>1</b>
Diablo Canyon						
<b>Plants</b>	<b><i>Lespedeza leptostachya</i></b>		<b>Prairie bush-clover</b>		<b>T</b>	<b>13</b>
Arnold	Braidwood	Byron	Cook	Cooper	Dresden	
Fort Calhoun	LaCrosse	LaSalle	Monticello	Prairie Island	Quad Cities	
Zion						
<b>Plants</b>	<b><i>Lesquerella kingii bernardina</i></b>		<b>San Bernardino Mountains</b>		<b>E</b>	<b>1</b>
San Onofre						
<b>Plants</b>	<b><i>Lesquerella lyrata</i></b>		<b>Lyrate bladderpod</b>		<b>T</b>	<b>1</b>
Browns Ferry						
<b>Plants</b>	<b><i>Liatris helleri</i></b>		<b>Heller's blazingstar</b>		<b>T</b>	<b>2</b>
Catawba	McGuire					
<b>Plants</b>	<b><i>Liatris ohlingerae</i></b>		<b>Scrub blazingstar</b>		<b>E</b>	<b>2</b>
Crystal River	St. Lucie					
<b>Plants</b>	<b><i>Lindera melissifolia</i></b>		<b>Pondberry</b>		<b>E</b>	<b>6</b>
Brunswick	Grand Gulf	Harris	Hatch	Robinson	Vogtle	
<b>Plants</b>	<b><i>Lomatium bradshawii</i></b>		<b>Bradshaw's desert-parsley</b>		<b>E</b>	<b>1</b>
Trojan						
<b>Plants</b>	<b><i>Lotus dendroideus traskiae</i></b>		<b>San Clemente Island broom</b>		<b>E</b>	<b>1</b>
San Onofre						
<b>Plants</b>	<b><i>Lupinus aridorum</i></b>		<b>Scrub lupine</b>		<b>E</b>	<b>2</b>
Crystal River	St. Lucie					
<b>Plants</b>	<b><i>Lupinus citrinus deflexus</i></b>		<b>Lupine, Mariposa</b>		<b>PE</b>	<b>1</b>
Diablo Canyon						

Class	Species	Common Name	Status	# Sites:
<b>Plants</b> Diablo Canyon	<i>Lupinus nipomensis</i>	Lupine, Nipomo Mesa	C	1
<b>Plants</b> Diablo Canyon	<i>Lupinus tidestromii</i>	Clover lupine	E	1
<b>Plants</b> Brunswick Summer	<i>Lysimachia asperulaefolia</i> Catawba Vogtle	Rough-leaved loosestrife McGuire Oconee	E	8 Robinson
<b>Plants</b> Farley	<i>Macbridea alba</i>	White birds-in-a-nest	T	1
<b>Plants</b> San Onofre	<i>Malacothamnus clementinus</i>	San Clemente Island bush-mallow	E	1
<b>Plants</b> Browns Ferry	<i>Marshallia mohrii</i> Sequoyah	Mohr's Barbara's buttons Watts Bar	T	3
<b>Plants</b> Kewaunee	<i>Mimulus glabratus michiganensis</i> Point Beach	Michigan monkey-flower	E	2
<b>Plants</b> Diablo Canyon	<i>Mimulus shevockii</i>	Monkey-flower, Kelso Creek	PE	1
<b>Plants</b> Hope Creek	<i>Narthecium americanum</i> Oyster Creek	Bog asphodel Salem	C	3
<b>Plants</b> San Onofre	<i>Navarretia fossalis</i>	Navarretia, prostrate (=no-named)	PT	1
<b>Plants</b> Diablo Canyon	<i>Navarretia leucocephala pauciflora</i>	Navarretia, few-flowered	PE	1
<b>Plants</b> Diablo Canyon	<i>Navarretia leucocephala plieantha</i>	Navarretia, many-flowered	PE	1
<b>Plants</b> Diablo Canyon	<i>Navarretia setiloba</i>	Navarretia, Piute Mountains	PT	1
<b>Plants</b> Crystal River	<i>Nolina brittoniana</i> St. Lucie	Britton's beargrass	E	2
<b>Plants</b> Diablo Canyon	<i>Opuntia treleasei</i>	Bakersfield cactus	E	1
<b>Plants</b> San Onofre	<i>Orcuttia californica</i>	California Orcutt grass	E	1
<b>Plants</b> Diablo Canyon	<i>Orcuttia inequalis</i>	Orcutt grass, San Joaquin	PE	1
<b>Plants</b> Rancho Seco	<i>Orcuttia viscida</i>	Orcutt grass, Sacramento	PE	1
<b>Plants</b> Brunswick North Anna	<i>Oxypolis canbyi</i> Calvert Cliffs Peach Bottom	Canby's dropwort Catawba Robinson	E	11 Hatch
<b>Plants</b> San Onofre	<i>Oxytheca parishii goodmaniana</i>	Cushenbury oxytheca	E	1
<b>Plants</b> Crystal River	<i>Paronychia chartacea</i> St. Lucie	Papery whitlow-wort	T	2



<b>Class</b>	<b>Species</b>	<b>Common Name</b>	<b>Status</b>	<b># Sites:</b>
<b>Plants</b> Diablo Canyon	<i>Parvisedum leiocarpum</i>	Stonecrop, Lake County	PE	1
<b>Plants</b> Browns Ferry	<i>Phyllitis scolopendrium americana</i> Fitzpatrick	Fern, American Hart's-tongue Ginna	T	5
<b>Plants</b> Farley	<i>Pinguicula ionantha</i>	Godfrey's butterwort	T	1
<b>Plants</b> Sequoyah	<i>Pityopsis ruthii</i> Watts Bar	Ruth's golden aster	E	2
<b>Plants</b> Arnold Davis-Besse Palisades	<i>Platanthera leucophaea</i> Braidwood Dresden Perry	Eastern prairie fringed orchid Byron Fermi Point Beach	T	17
<b>Plants</b> Arnold Prairie Island	<i>Platanthera praeclara</i> Byron Quad Cities	Western prairie fringed orchid Callaway Kewaunee Quad Cities	T	9
<b>Plants</b> San Onofre	<i>Pogogyne abramsii</i>	San Diego mesa mint Clinton LaSalle Zion	E	1
<b>Plants</b> San Onofre	<i>Pogogyne nudiuscula</i>	Otay mesa mint	E	1
<b>Plants</b> Crystal River	<i>Polygala lewtonii</i> St. Lucie	Lewton's polygala	E	2
<b>Plants</b> Turkey Point	<i>Polygala smallii</i>	Tiny polygala	E	1
<b>Plants</b> Crystal River	<i>Polygonella basiramia</i> St. Lucie	Wireweed	E	2
<b>Plants</b> Big Rock Point	<i>Potamogeton hillii</i>			1
<b>Plants</b> Vermont Yankee	<i>Potentilla robbinsiana</i>	Robbins' cinquefoil	E	1
<b>Plants</b> Crystal River	<i>Prunus geniculata</i> St. Lucie	Scrub plum	E	2
<b>Plants</b> Diablo Canyon	<i>Pseudobahia bahiifolia</i>	Sunburst, Hartweg's golden	E	1
<b>Plants</b> Diablo Canyon	<i>Pseudobahia peirsonii</i>	Sunburst, San Joaquin adobe	T	1
<b>Plants</b> Arkansas	<i>Ptilimnium nodosum</i> Browns Ferry	Harperella Harris	E	6
<b>Plants</b> Diablo Canyon	<i>Puccinellia parishii</i> San Onofre	Alkali grass, Parish's	PE	2
<b>Plants</b> Palo Verde	<i>Purshia subintegra</i>	Arizona cliffrose	E	1
<b>Plants</b> Farley	<i>Rhododendron chapmanii</i>	Chapman rhododendron	E	1
<b>Plants</b> Catawba	<i>Rhus michauxii</i> Harris	Michaux's sumac McGuire	E	7
		Oconee	Robinson	Summer

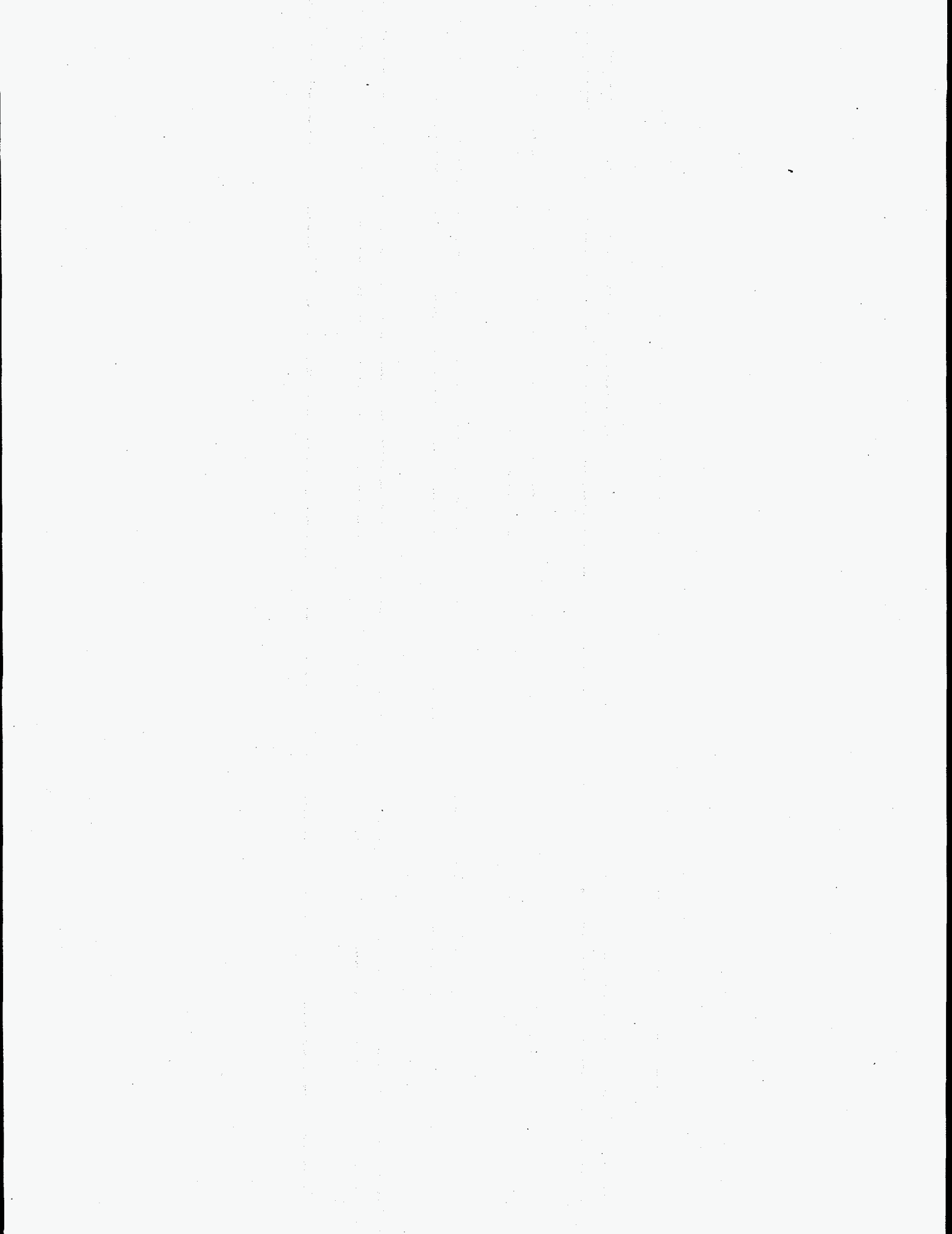
Class	Species		Common Name		Status	# Sites:
Vogle						
Plants	Rhynchospora knieskernii		Knieskern's beaked-rush		T	6
Hope Creek	Indian Point	Limerick	Oyster Creek	Peach Bottom	Salem	
Plants	Ribes echinellum		Miccosukee gooseberry		T	3
Oconee	Summer	Vogle				
Plants	Rorippa gambellii		Gambel's watercress		E	2
Diablo Canyon	San Onofre					
Plants	Sagittaria fasciculata		Bunched arrowhead		E	2
Oconee	Summer					
Plants	Sagittaria secundifolia		Kral's water-plantain		T	2
Browns Ferry	Sequoyah					
Plants	Sanicula maritima		Sanicle, adobe		PE	1
Diablo Canyon						
Plants	Sarracenia oreophila		Green pitcher-plant		E	4
Browns Ferry	Oconee	Sequoyah	Watts Bar			
Plants	Sarracenia rubra jonesii		Mountain sweet pitcher-plant		E	2
Oconee	Summer					
Plants	Schwalbea americana		American chaffseed		E	11
Brunswick	Farley	Harris	Hope Creek	Limerick	Oyster Creek	
Robinson	Salem	Summer	Surry	Vogle		
Plants	Scirpus ancistrochaetus		Northeastern (=Barbed bristle)		E	9
Haddam Neck	Indian Point	Limerick	North Anna	Peach Bottom	Susquehanna	
Three Mile Island	Vermont Yankee	Yankee Rowe				
Plants	Scutellaria floridana		Florida skullcap		T	1
Farley						
Plants	Scutellaria montana		Large-flowered skullcap		E	2
Sequoyah	Watts Bar					
Plants	Sedum integrifolium leedyi		Leedy's roseroot		T	5
Fitzpatrick	Ginna	LaCrosse	Nine Mile Point	Prairie Island		
Plants	Sidalcea nelsoniana		Nelson's checker-mallow		T	1
Trojan						
Plants	Sidalcea pedata		Pedate checker-mallow		E	1
San Onofre						
Plants	Silene polypetala		Fringed campion		E	1
Farley						
Plants	Sisyrinchium dichotomum		White irisette		E	4
Catawba	McGuire	Oconee	Summer			
Plants	Solidago houghtonii		Houghton's goldenrod		T	1
Big Rock Point						
Plants	Solidago spithamaea		Blue Ridge goldenrod		T	2
Catawba	McGuire					
Plants	Spigelia gentianoides		Gentian pinkroot		E	1
Farley						
Plants	Spiraea virginiana		Virginia spiraea		T	3
Oconee	Sequoyah	Watts Bar				

Class	Species	Common Name	Status	# Sites:
<b>Plants</b>	<b><i>Stewartia malacodendron</i></b>			<b>1</b>
Vogtle				
<b>Plants</b>	<b><i>Suaeda californica</i></b>	<b>Seablite, California</b>	<b>E</b>	<b>2</b>
Diablo Canyon	San Onofre			
<b>Plants</b>	<b><i>Thalictrum cooleyi</i></b>	<b>Cooley's meadowrue</b>	<b>E</b>	<b>3</b>
Brunswick	Farley	Robinson		
<b>Plants</b>	<b><i>Thelypodium stenopetalum</i></b>	<b>Slender-petaled mustard</b>	<b>E</b>	<b>1</b>
San Onofre				
<b>Plants</b>	<b><i>Thelypteris pilosa alabamensis</i></b>	<b>Alabama streak-sorus fern</b>	<b>T</b>	<b>1</b>
Browns Ferry				
<b>Plants</b>	<b><i>Torreya taxifolia</i></b>	<b>Florida torreya</b>	<b>E</b>	<b>1</b>
Farley				
<b>Plants</b>	<b><i>Trifolium stoloniferum</i></b>	<b>Running buffalo clover</b>	<b>E</b>	<b>3</b>
Big Rock Point	Callaway	Wolf Creek		
<b>Plants</b>	<b><i>Trillium persistens</i></b>	<b>Persistent trillium</b>	<b>E</b>	<b>1</b>
Oconee				
<b>Plants</b>	<b><i>Trillium reliquum</i></b>	<b>Relict trillium</b>	<b>E</b>	<b>5</b>
Browns Ferry	Farley	Hatch	Summer	Vogtle
<b>Plants</b>	<b><i>Verbena californica</i></b>	<b>Vervain, Red Hills</b>	<b>PT</b>	<b>1</b>
Diablo Canyon				
<b>Plants</b>	<b><i>Verbesina dissita</i></b>	<b>Crownbeard, big-leaved</b>	<b>T</b>	<b>1</b>
San Onofre				
<b>Plants</b>	<b><i>Warea amplexifolia</i></b>	<b>Wide-leaf warea</b>	<b>E</b>	<b>2</b>
Crystal River	St. Lucie			
<b>Plants</b>	<b><i>Warea carteri</i></b>	<b>Carter's mustard</b>	<b>E</b>	<b>2</b>
Crystal River	St. Lucie			
<b>Plants</b>	<b><i>Xyris tennesseensis</i></b>	<b>Tennessee yellow-eyed grass</b>	<b>E</b>	<b>3</b>
Browns Ferry	Sequoyah	Watts Bar		
<b>Plants</b>	<b><i>Ziziphus celata</i></b>	<b>Florida ziziphus</b>	<b>E</b>	<b>2</b>
Crystal River	St. Lucie			
<b>Reptiles</b>	<b><i>Alligator mississippiensis</i></b>	<b>Alligator, American</b>	<b>T/SA</b>	<b>2</b>
St. Lucie	Turkey Point			
<b>Reptiles</b>	<b><i>Caretta caretta</i></b>	<b>Turtle, loggerhead sea</b>	<b>T</b>	<b>27</b>
Brunswick	Calvert Cliffs	Crystal River	Diablo Canyon	Farley
Hatch	Hope Creek	Indian Point	Limerick	Millstone
Oyster Creek	Peach Bottom	Pilgrim	Robinson	Salem
Seabrook	Shoreham	South Texas	St. Lucie	Surry
Turkey Point	Vogtle	Waterford		
<b>Reptiles</b>	<b><i>Chelonia mydas</i></b>	<b>Turtle, green sea</b>	<b>E,T</b>	<b>21</b>
Big Rock Point	Brunswick	Crystal River	Diablo Canyon	Farley
Hatch	Hope Creek	Indian Point	Millstone	Oyster Creek
Salem	San Onofre	Seabrook	Shoreham	South Texas
Surry	Turkey Point	Waterford		
<b>Reptiles</b>	<b><i>Clemmys muhlenbergii</i></b>	<b>Bog turtle</b>	<b>PT/P</b>	<b>13</b>
Fitzpatrick	Ginna	Haddam Neck	Hope Creek	Limerick
Nine Mile Point	North Anna	Oconee	Oyster Creek	Peach Bottom
Three Mile Island				McGuire
				Salem

Class	Species		Common Name		Status	# Sites:
Reptiles	Crocodylus acutus		Crocodile, American		E	1
Turkey Point						
Reptiles	Dermochelys coriacea		Turtle, leatherback sea		E	13
Brunswick	Calvert Cliffs	Crystal River	Farley	Hatch	Millstone	
Pilgrim	Seabrook	Shoreham	South Texas	St. Lucie	Surry	
Turkey Point						
Reptiles	Drymarchon corais couperi		Snake, eastern indigo		T	7
Browns Ferry	Crystal River	Farley	Hatch	St. Lucie	Turkey Point	
Vogtle						
Reptiles	Eretmochelys imbricata		Turtle, hawksbill sea (=carey)		E	18
Brunswick	Calvert Cliffs	Crystal River	Diablo Canyon	Farley	Haddam Neck	
Hatch	Hope Creek	Limerick	Millstone	Peach Bottom	Pilgrim	
Salem	Seabrook	South Texas	St. Lucie	Surry	Turkey Point	
Reptiles	Eumeces egregius lividus		Skink, bluetail (=blue-tailed mole		T	2
Crystal River						
St. Lucie						
Reptiles	Gambelia silus		Lizard, blunt-nosed leopard		E	2
Diablo Canyon						
San Onofre						
Reptiles	Gopherus agassizii		Tortoise, desert		E	3
Diablo Canyon						
Palo Verde						
San Onofre						
Reptiles	Graptemys caglei		Cagle's map turtle		C	1
South Texas						
Reptiles	Graptemys oculifera		Turtle, ringed map (=sawback)		T	3
Grand Gulf						
River Bend						
Waterford						
Reptiles	Lepidochelys kempii		Turtle, Kemp's (=Atlantic) ridley		E	22
Brunswick	Calvert Cliffs	Crystal River	Farley	Haddam Neck	Hatch	
Hope Creek	Indian Point	Limerick	Millstone	Oyster Creek	Peach Bottom	
Pilgrim	River Bend	Salem	Seabrook	Shoreham	South Texas	
St. Lucie	Surry	Turkey Point	Waterford			
Reptiles	Lepidochelys olivacea		Turtle, olive (=Pacific) ridley sea		E	2
Diablo Canyon						
San Onofre						
Reptiles	Neoseps reynoldsi		Skink, sand		T	2
Crystal River						
St. Lucie						
Reptiles	Nerodia erythrogaster neglecta		Northern copperbelly water		T	3
Cook						
Fermi						
Palisades						
Reptiles	Nerodia fasciata taeniata		Snake, Atlantic salt marsh		T	1
St. Lucie						
Reptiles	Nerodia harteri paucimaculata		Snake, Concho water		T	1
Comanche Peak						
Reptiles	Nerodia sipedon insularum		Lake Erie water snake		PT	2
Davis-Besse						
Fermi						
Reptiles	Phrynosoma mcallii		Flat-tailed horned lizard		PT	2
Palo Verde						
San Onofre						
Reptiles	Pseudemys rubriventris bangsi		Turtle, Plymouth redbelly		E	1
Pilgrim						
Reptiles	Sternotherus depressus		Turtle, flattened musk		T	1
Browns Ferry						



Class	Species	Common Name	Status	# Sites:
<b>Reptiles</b>	<i>Thamnophis gigas</i>	Snake, giant garter	T	2
Diablo Canyon	Rancho Seco			
<b>Reptiles</b>	<i>Uma inornata</i>	Lizard, Coachella Valley	T	1
San Onofre				
<b>Reptiles</b>	<i>Xantusia riversiana</i>	Lizard, Island night	T	2
Diablo Canyon	San Onofre			
<b>Snails</b>	<i>Anguispira picta</i>	Snail, painted snake coiled forest	T	2
Browns Ferry	Sequoyah			
<b>Snails</b>	<i>Athearnia anthonyi</i>	Riversnail, Anthony's	E	3
Browns Ferry	Sequoyah	Watts Bar		
<b>Snails</b>	<i>Discus macclintocki</i>	Snail, Iowa Pleistocene	E	4
Arnold	Byron	LaCrosse	Quad Cities	
<b>Snails</b>	<i>Helminthoglypta walkeriana</i>	Snail, Morro shoulderband	E	1
Diablo Canyon				
<b>Snails</b>	<i>Marstonia ogmoraphe</i>	Marstonia (snail, royal (=obese)	E	2
Sequoyah	Watts Bar			
<b>Snails</b>	<i>Mesodon clarki nantahala</i>	Snail, noonday	T	2
Oconee	Watts Bar			
<b>Snails</b>	<i>Mesodon magazinensis</i>	Shagreen, Magazine Mountain	T	1
Arkansas				
<b>Snails</b>	<i>Orthalicus reses</i>	Snail, Stock Island tree	T	1
Turkey Point				
<b>Snails</b>	<i>Sonorella eremita</i>	San Xavier talussnail	PE	1
Palo Verde				
<b>Snails</b>	<i>Succinea chittenangoensis</i>	Snail, Chittenango ovate amber	T	2
Fitzpatrick	Nine Mile Point			



**APPENDIX C**

**Summary Data and Criteria for Preliminary Ranking System**

Table C.1 Aquatic Species Subscores for Ranking System

Site	# Aquatic Species	# 1996 FWS/NMFS	# FES or other	# Gen&Sys 32 km	# Gen&Sys 100 km	# Known Species	# Managed Species	# Critical Habitats	Species Sub-Score
Arkansas	5	0	0	0	5	0	0	0	2.5
Arnold	3	0	0	1	2	0	0	0	2
Beaver Valley	7	5	3	0	2	0	0	0	35
Big Rock Point	0	0	0	0	0	0	0	0	0
Braidwood	1	0	0	0	1	0	0	0	.5
Browns Ferry	35	0	0	10	25	0	0	0	22.5
Brunswick	7	6	1	6	1	4	0	0	79.5
Byron	3	0	0	0	3	0	0	0	1.5
Callaway	7	4	0	2	3	4	0	0	63.5
Calvert Cliffs	8	2	0	3	5	2	0	0	35.5
Catawba	2	0	0	1	1	0	0	0	1.5
Clinton	1	0	0	0	1	0	0	0	.5
Comanche Peak	0	0	0	0	0	0	0	0	0
Cook	2	1	0	0	2	0	0	0	6
Cooper	3	3	0	1	0	3	0	0	46
Crystal River	9	7	0	7	2	4	0	0	83
Davis-Besse	2	0	0	1	1	0	0	0	1.5
Diablo Canyon	15	8	7	5	4	4	0	0	108
Dresden	0	0	0	0	0	0	0	0	0
Farley	3	0	1	1	2	0	0	0	5
Fermi	3	1	0	1	2	0	0	0	7
Fitzpatrick	0	0	0	0	0	0	0	0	0
Fort Calhoun	3	3	0	1	0	3	0	0	46
Fort St. Vrain	0	0	0	0	0	0	0	0	0
Ginna	0	0	0	0	0	0	0	0	0

Table C.1 Aquatic Species Subscores for Ranking System

Site	# Aquatic Species	# 1996 FWS/NMFS	# FES or other	# Gen&Sys 32 km	# Gen&Sys 100 km	# Known Species	# Managed Species	# Critical Habitats	Species Sub-Score
Grand Gulf	3	0	1	3	0	1	0	0	16
Haddam Neck	1	1	1	1	0	1	0	0	19
Harris	4	2	1	2	2	1	0	1	36
Hatch	1	1	1	1	0	1	0	0	19
Hope Creek	7	4	4	4	2	4	4	0	37
Indian Point	2	1	1	2	0	1	0	0	20
Kewaunee	0	0	0	0	0	0	0	0	0
LaCrosse	1	1	1	1	0	1	0	0	19
LaSalle	7	0	0	0	7	0	0	0	3.5
Limerick	2	0	1	0	2	1	0	0	14
Maine Yankee	2	0	2	1	0	2	1	0	17
McGuire	3	1	0	1	2	0	0	0	7
Millstone	6	5	0	4	1	5	0	0	79.5
Monticello	2	0	0	0	2	0	0	0	1
Nine Mile Point	0	0	0	0	0	0	0	0	0
North Anna	4	2	1	1	2	2	0	0	35
Oconee	5	0	0	3	2	0	0	0	4
Oyster Creek	4	3	0	2	1	3	3	0	17.5
Palisades	2	0	0	0	2	0	0	0	1
Palo Verde	7	3	5	2	5	3	0	2	84.5
Peach Bottom	3	0	0	2	1	0	0	0	2.5
Perry	3	0	0	1	2	0	0	0	2
Pilgrim	8	6	0	3	2	6	0	1	104
Point Beach	0	0	0	0	0	0	0	0	0
Prairie Island	2	1	1	1	1	1	0	0	19.5

*Threatened and Endangered Species Evaluation*

Table C.1 Aquatic Species Subscores for Ranking System

Site	# Aquatic Species	# 1996 FWS/NMFS	# FES or other	# Gen&Sys 32 km	# Gen&Sys 100 km	# Known Species	# Managed Species	# Critical Habitats	Species Sub-Score
Quad Cities	3	1	0	3	0	1	0	1	28
Rancho Seco	5	5	0	0	0	5	0	1	85
River Bend	4	1	0	3	1	1	0	0	18.5
Robinson	3	1	0	0	3	0	0	0	6.5
Salem	7	4	4	4	2	4	4	0	37
San Onofre	17	7	3	12	0	3	1	0	76
Seabrook	9	4	2	3	3	1	0	0	40.5
Sequoiah	38	0	0	23	15	0	0	0	30.5
Shoreham	5	5	0	3	1	5	0	0	78.5
South Texas	8	8	0	5	0	4	0	0	85
St. Lucie	8	7	6	6	1	6	6	1	69.5
Summer	2	0	0	0	2	0	0	0	1
Surry	9	5	5	3	5	0	0	0	45.5
Susquehanna	1	0	0	0	1	0	0	0	.5
Three Mile Island	2	0	0	0	2	0	0	0	1
Trojan	4	3	2	1	1	3	0	0	52.5
Turkey Point	9	8	7	7	0	7	2	2	138
Vermont Yankee	2	1	0	2	0	0	0	0	7
Vogtle	2	1	1	1	1	1	0	0	19.5
Waterford	3	2	0	3	0	2	0	0	33
Watts Bar	38	5	5	15	23	5	5	0	66.5
WNP-2	3	1	3	2	0	3	0	0	46
Wolf Creek	2	1	1	1	1	1	0	0	19.5
Yankee Rowe	2	0	0	1	1	0	0	0	1.5
Zion	0	0	0	0	0	0	0	0	0



Table C.2 Summary of Aquatic Ecological Impacts for Ranking System

Site	Power (MWt)	Power Scale	Cooling System	Cooling Scale	Water Source / Heat Sink	Source Scale	Aquatic Impact	Scaled Impact
Arkansas	5383	5	Once Through / Natural Draft Cooling Towers	4	Reservoir	2	40	4
Arnold	1658	1	Mechanical Draft Cooling Towers	2	Small River	5	10	2
Beaver Valley	5304	5	Natural Draft Cooling Towers	2	Medium River	4	40	4
Big Rock Point	240	1	Once Through	5	Great Lake	1	5	1
Braidwood	6822	6	Closed Cycle Cooling Pond	3	Other	3	54	4
Browns Ferry	9879	7	Once Through with Helper towers	4	River-Reservoir	2	56	4
Brunswick	4872	4	Once Through	5	Estuary	5	100	6
Byron	6822	6	Natural Draft Cooling Towers	2	Small River	5	60	5
Callaway	3565	3	Natural Draft Cooling Towers	2	Big River	3	18	2
Calvert Cliffs	5400	5	Once Through	5	Estuary	5	125	6
Catawba	6822	6	Mechanical Draft Cooling Towers	2	Reservoir	2	24	3
Clinton	2894	2	Once Through	5	Small River	5	50	4
Comanche Peak	6822	6	Once Through	5	Reservoir	2	60	5
Cook	6661	6	Once Through	5	Great Lake	1	30	3
Cooper	2381	2	Once Through	5	Medium River	4	40	4
Crystal River	2544	2	Once Through	5	Ocean	2	20	3
Davis-Besse	2772	2	Natural Draft Cooling Towers	2	Great Lake	1	4	1
Diablo Canyon	6749	6	Once Through	5	Ocean	2	60	5
Dresden	5054	5	Cooling Lake & Spray Canal	3	Other	3	45	4
Farley	5304	5	Mechanical Draft Cooling Towers	2	Small River	5	50	4
Fermi	3292	3	Natural Draft Cooling Towers	2	Great Lake	1	6	1
Fitzpatrick	2436	2	Once Through	5	Great Lake	1	10	2
Fort Calhoun	1500	1	Once Through	5	Medium River	4	20	3
Fort St. Vrain	842	1	Mechanical Draft Cooling Towers	2	Small River	5	10	2
Ginna	1520	1	Once Through	5	Great Lake	1	5	1

**Table C.2 Summary of Aquatic Ecological Impacts for Ranking System**

Site	Power (MWt)	Power Scale	Cooling System	Cooling Scale	Water Source / Heat Sink	Source Scale	Aquatic Impact	Scaled Impact
Grand Gulf	3833	3	Natural Draft Cooling Towers	2	Big River	3	18	2
Haddam Neck	1825	1	Once Through	5	Small River	5	25	3
Harris	2775	2	Natural Draft Cooling Towers	2	Reservoir	2	8	1
Hatch	4872	4	Mechanical Draft Cooling Towers	2	Small River	5	40	4
Hope Creek	3293	3	Natural Draft Cooling Towers	2	Estuary	5	30	3
Indian Point	5783	5	Once Through	5	Big River	3	75	5
Kewaunee	1650	1	Once Through	5	Great Lake	1	5	1
LaCrosse	165	1	Once Through	5	Big River	3	15	2
LaSalle	6646	6	Closed Cycle Cooling Pond	3	Reservoir	2	36	3
Limerick	6586	6	Natural Draft Cooling Towers	2	Small River	5	60	5
Maine Yankee	2700	2	Once Through	5	Estuary	5	50	4
McGuire	6822	6	Once Through	5	Reservoir	2	60	5
Millstone	8122	7	Once Through	5	Ocean	2	70	5
Monticello	1670	1	Once through with Helper Towers	4	Medium River	4	16	2
Nine Mile Point	5173	5	Once Through / Natural Draft Cooling Towers	4	Great Lake	1	20	3
North Anna	5786	5	Once Through	5	Reservoir	2	50	4
Oconee	7704	7	Once Through	5	Reservoir	2	70	5
Oyster Creek	1930	1	Once Through	5	Estuary	5	25	3
Palisades	2530	2	Mechanical Draft Cooling Towers	2	Great Lake	1	4	1
Palo Verde	11400	7	Mechanical Draft Cooling Towers	2	Sewer	1	14	2
Peach Bottom	6586	6	Once through with helper towers	4	River-Reservoir	2	48	4
Perry	3579	3	Natural Draft Cooling Towers	2	Great Lake	1	6	1
Pilgrim	1998	2	Once Through	5	Ocean	2	20	3
Point Beach	3038	3	Once Through	5	Great Lake	1	15	2
Prairie Island	3300	3	Once through / mechanical Draft cooling	4	Medium River	4	48	4

Table C.2 Summary of Aquatic Ecological Impacts for Ranking System

Site	Power (MWt)	Power Scale	Cooling System	Cooling Scale	Water Source / Heat Sink	Source Scale	Aquatic Impact	Scaled Impact
Quad Cities	5022	5	Once Through	5	Big River	3	75	5
Rancho Seco	2772	2	Natural Draft Cooling Towers	2	Small River	5	20	3
River Bend	2894	2	Mechanical Draft Cooling Towers	2	Big River	3	12	2
Robinson	2300	2	Once Through	5	Reservoir	2	20	3
Salem	6822	6	Once Through	5	Estuary	5	150	6
San Onofre	8127	7	Once Through	5	Ocean	2	70	5
Seabrook	3411	3	Once Through	5	Ocean	2	30	3
Sequoyah	6822	6	Once Through / Natural Draft Cooling towers	4	River-Reservoir	2	48	4
Shoreham	2436	2	Once Through	5	Ocean	2	20	3
South Texas	7600	7	Closed cycle cooling Lake	3	Reservoir	2	42	4
St. Lucie	5400	5	Once Through	5	Ocean	2	50	4
Summer	2775	2	Once Through	5	Reservoir	2	20	3
Surry	4882	4	Once Through	5	Estuary	5	100	6
Susquehanna	6586	6	Natural Draft Cooling Towers	2	Small River	5	60	5
Three Mile Island	2568	2	Natural Draft Cooling Towers	2	Medium River	4	16	2
Trojan	3411	3	Natural Draft Cooling Towers	2	Big River	3	18	2
Turkey Point	4400	4	Closed Cycle Canal	3	Other	3	36	3
Vermont Yankee	1593	1	Once through with helper towers	4	Small River	5	20	3
Vogtle	6822	6	Natural Draft Cooling Towers	2	Medium River	4	48	4
Waterford	3390	3	Once Through	5	Big River	3	45	4
Watts Bar	6822	6	Natural Draft Cooling Towers	2	River-Reservoir	2	24	3
WNP-2	3323	3	Mechanical Draft Cooling Towers	2	Medium River	4	24	3
Wolf Creek	3411	3	Closed cycle cooling lake	3	Reservoir	2	18	2
Yankee Rowe	600	1	Once Through	5	Small River	5	25	3
Zion	6500	6	Once Through	5	Great Lake	1	30	3

Table C.3 Overall Aquatic Scores and Ranks

Site	Species Sub-Score	Aquatic Impact	Scaled Impact	Aquatic Score 1	Aquatic Score 2	Aquatic Rank 1	Aquatic Rank 2
Arkansas	2.5	40	4	10	100	49.5	51
Arnold	2	10	2	4	20	56	59.5
Beaver Valley	35	40	4	140	1400	19	22
Big Rock Point	0	5	1	0	0	70.5	70.5
Braidwood	.5	54	4	2	27	61	57
Browns Ferry	22.5	56	4	90	1260	30	23
Brunswick	79.5	100	6	477	7950	2	1
Byron	1.5	60	5	7.5	90	52	52
Callaway	63.5	18	2	127	1143	24	26
Calvert Cliffs	35.5	125	6	213	4437.5	14	8
Catawba	1.5	24	3	4.5	36	54.5	55
Clinton	.5	50	4	2	25	61	58
Comanche Peak	0	60	5	0	0	70.5	70.5
Cook	6	30	3	18	180	48	46
Cooper	46	40	4	184	1840	16	13
Crystal River	83	20	3	249	1660	11	16
Davis-Besse	1.5	4	1	1.5	6	64	64
Diablo Canyon	108	60	5	540	6480	1	2
Dresden	0	45	4	0	0	70.5	70.5
Farley	5	50	4	20	250	45.5	44
Fermi	7	6	1	7	42	53	53
Fitzpatrick	0	10	2	0	0	70.5	70.5
Fort Calhoun	46	20	3	138	920	21.5	32
Fort St. Vrain	0	5	1	0	0	70.5	70.5
Ginna	0	5	1	0	0	70.5	70.5
Grand Gulf	16	18	2	32	288	43	40.5
Haddam Neck	19	25	3	57	475	36	36
Harris	36	8	1	36	288	41	40.5
Hatch	19	40	4	76	760	33	35
Hope Creek	37	30	3	111	1110	27	27
Indian Point	20	75	5	100	1500	29	19
Kewaunee	0	5	1	0	0	70.5	70.5
LaCrosse	19	3	1	38	285	39	42
LaSalle	3.5	36	3	10.5	126	51	49
Limerick	14	60	5	70	840	34	34
Maine Yankee	17	50	4	68	850	35	33
McGuire	7	60	5	35	420	42	38
Millstone	79.5	70	5	397.5	5565	4	3

**Table C.3 Overall Aquatic Scores and Ranks**

Site	Species Sub-Score	Aquatic Impact	Scaled Impact	Aquatic Score 1	Aquatic Score 2	Aquatic Rank 1	Aquatic Rank 2
Monticello	1	16	2	2	16	61	61.5
Nine Mile Point	0	20	3	0	0	70.5	70.5
North Anna	35	50	4	140	1750	19	14
Oconee	4	70	5	20	280	45.5	43
Oyster Creek	17.5	25	3	52.5	437.5	37	37
Palisades	1	4	1	1	4	65	65
Palo Verde	84.5	14	2	169	1183	16	25
Peach Bottom	2.5	48	4	10	120	49.5	50
Perry	2	6	1	2	12	61	63
Pilgrim	104	20	3	312	2080	7	12
Point Beach	0	15	2	0	0	70.5	70.5
Prairie Island	19.5	48	4	78	936	31.5	30.5
Quad Cities	28	75	5	140	2100	19	11
Rancho Seco	85	20	3	255	1700	10	15
River Bend	18.5	12	2	37	222	40	45
Robinson	6.5	20	3	19.5	130	47	48
Salem	37	150	6	222	5550	13	4
San Onofre	76	70	5	380	5320	5	5
Seabrook	40.5	30	3	121.5	1215	26	24
Sequoyah	30.5	48	4	122	1464	25	21
Shoreham	78.5	20	3	235.5	1570	12	18
South Texas	85	42	4	340	3570	6	9
St. Lucie	69.5	50	4	278	3475	8	10
Summer	1	20	3	3	20	57	59.5
Surry	45.5	100	6	273	4550	9	7
Susquehanna	.5	60	5	2.5	30	58	56
Three Mile Island	1	16	2	2	16	61	61.5
Trojan	52.5	18	2	105	945	28	29
Turkey Point	138	36	3	414	4968	3	6
Vermont Yankee	7	20	3	21	140	44	47
Vogtle	19.5	48	4	78	936	31.5	30.5
Waterford	33	45	4	132	1485	23	20
Watts Bar	66.5	24	3	199.5	1596	15	17
WNP-2	46	24	3	138	1104	21.5	28
Wolf Creek	19.5	18	2	39	351	38	39
Yankee Rowe	1.5	25	3	4.5	37.5	54.5	54
Zion	0	30	3	0	0	70.5	70.5

**Table C.4 Terrestrial Species Sub-Scores for Ranking Systems**

Site	# of Animals	# of Plants	# 1996 FWS/NMFS	# FES or Other	# Gen&Sys 32 km	# Gen&Sys 100 km	# Known Species	# Managed species	# Critical Habitats	Species Sub-Score
Arkansas	8	2	0	1	6	4	1	0	0	21
Arnold	3	4	4	0	7	0	2	0	0	47
Beaver Valley	5	2	3	5	3	3	1	0	0	44.5
Big Rock Point	1	1	2	0	2	2	0	0	0	13
Braidwood	6	7	7	2	7	5	2	0	0	70.5
Browns Ferry	10	12	4	0	10	10	0	0	0	35
Brunswick	5	7	8	3	9	4	4	0	0	100
Byron	7	7	5	0	3	10	1	0	0	43
Callaway	6	3	3	5	3	5	1	0	0	45.5
Calvert Cliffs	7	6	5	1	7	6	5	2	0	68
Catawba	6	15	3	0	7	14	3	0	0	59
Clinton	2	4	2	2	2	4	1	0	0	30
Comanche Peak	10	0	4	6	2	2	5	0	0	91
Cook	8	5	2	0	7	6	0	0	0	20
Cooper	7	2	7	2	5	4	2	0	0	68
Crystal River	12	22	0	1	15	19	1	0	0	37.5
Davis-Besse	8	2	8	4	8	1	8	0	0	140.5
Diablo Canyon	32	47	42	18	43	21	8	0	0	397.5
Dresden	6	6	4	3	6	6	1	0	0	48
Farley	10	14	4	4	9	15	0	0	0	48.5
Fermi	8	2	1	0	8	2	0	0	0	14
Fitzpatrick	5	3	2	2	6	1	1	0	0	32.5
Fort Calhoun	6	2	6	1	6	0	1	0	0	49
Fort St. Vrain	3	0	0	3	0	0	1	0	0	19
Ginna	4	3	1	1	2	4	1	0	0	22



Table C.4 Terrestrial Species Sub-Scores for Ranking Systems

Site	# of Animals	# of Plants	# 1996 FWS/NMFS	# FES or Other	# Gen&Sys 32 km	# Gen&Sys 100 km	# Known Species	# Managed species	# Critical Habitats	Species Sub-Score
Grand Gulf	9	1	0	5	5	4	1	0	0	32
Haddam Neck	9	4	2	1	6	6	2	0	0	42
Harris	5	6	4	4	9	4	2	0	0	63
Hatch	10	4	8	3	6	7	7	0	0	128.5
Hope Creek	8	7	5	2	7	6	5	0	0	91
Indian Point	6	7	0	0	4	9	0	0	0	8.5
Kewaunee	6	4	5	1	2	8	1	0	0	44
LaCrosse	5	4	3	2	7	2	3	0	0	59
LaSalle	6	7	4	3	7	5	4	0	1	88.5
Limerick	7	7	3	3	4	9	2	0	0	52.5
Maine Yankee	4	1	2	0	4	1	1	0	0	24.5
McGuire	9	15	4	0	4	19	2	0	0	53.5
Millstone	9	3	3	1	9	3	1	0	0	38.5
Monticello	4	3	2	0	4	3	2	0	0	35.5
Nine Mile Point	5	3	2	2	4	3	1	0	0	31.5
North Anna	9	8	4	3	3	14	3	0	0	69
Oconee	11	18	8	2	16	12	7	0	0	138
Oyster Creek	6	7	6	0	7	4	6	0	0	99
Palisades	8	3	2	1	7	3	3	0	0	51.5
Palo Verde	13	6	11	8	10	7	11	0	3	232.5
Peach Bottom	6	7	3	4	7	5	2	0	0	56.5
Perry	6	2	6	4	4	3	5	0	0	97.5
Pilgrim	10	2	5	0	4	8	2	0	0	53
Point Beach	6	4	5	1	2	8	2	0	0	54
Prairie Island	3	4	2	2	6	1	2	0	0	42.5

Table C.4 Terrestrial Species Sub-Scores for Ranking Systems

Site	# of Animals	# of Plants	# 1996 FWS/NMFS	# FES or Other	# Gen&Sys 32 km	# Gen&Sys 100 km	# Known Species	# Managed species	# Critical Habitats	Species Sub-Score
Quad Cities	4	5	2	0	7	2	1	0	0	28
Rancho Seco	11	1	11	1	0	0	11	0	0	168
River Bend	7	1	1	3	4	4	1	0	1	40
Robinson	6	11	2	3	10	7	3	1	0	52.5
Salem	8	7	5	2	7	6	5	0	0	91
San Onofre	34	37	20	15	44	22	5	0	0	250
Seabrook	7	3	2	3	3	7	1	0	0	35.5
Sequoyah	10	14	3	3	13	12	3	0	0	73
Shoreham	7	3	0	1	6	4	1	0	0	21
South Texas	19	4	21	8	5	9	10	0	1	248.5
St. Lucie	21	25	18	4	12	27	17	0	1	307.5
Sumner	6	16	1	2	9	13	1	0	0	36.5
Surry	9	6	2	4	9	6	2	0	0	54
Susquehanna	3	2	4	2	1	4	2	0	0	49
Three Mile Island	6	4	4	4	4	5	2	0	0	58.5
Trojan	12	4	7	6	9	6	7	1	0	118
Turkey Point	24	8	20	5	25	2	18	0	2	341
Vermont Yankee	6	4	2	1	5	5	1	0	0	30.5
Vogtle	10	13	12	4	11	10	12	0	0	208
Waterford	7	1	1	3	5	3	1	0	0	30.5
Watts Bar	10	12	2	2	10	12	2	2	0	32
WNP-2	8	0	2	4	2	4	1	0	0	36
Wolf Creek	6	3	4	5	5	3	3	0	0	71.5
Yankee Rowe	6	3	2	1	6	3	1	0	0	30.5
Zion	6	4	4	3	6	4	4	0	0	77

Table C.5 Overall Terrestrial Scores and Ranks

Site	Species Subscore	Corridor Length	Scaled Length	Terrestrial Score 1	Terrestrial Score 2	Terrestrial Rank 1	Terrestrial Rank 2
Arkansas	21	250	4	84	5250	57	28
Arnold	47	88	3	141	4136	36	33
Beaver Valley	44.5	28	2	89	1246	56	57
Big Rock Point	13	5	1	13	65	74	72
Braidwood	70.5	84	3	211.5	5922	26	25
Browns Ferry	35	83	3	105	2905	52.5	44
Brunswick	100	358	5	500	35800	10	6
Byron	43	54	3	129	2322	40	46
Callaway	45.5	50	3	136.5	2275	37	47.5
Calvert Cliffs	68	47	2	136	3196	38	40
Catawba	59	29	2	118	1711	44	54
Clinton	30	40	2	60	1200	63	58.5
Comanche Peak	91	14	2	182	1274	28	56
Cook	20	155	4	80	3100	58.5	41
Cooper	68	159	4	272	10812	20	11
Crystal River	37.5	125	4	150	4688	32	30
Davis-Besse	140.5	57	3	421.5	8009	11	21
Diablo Canyon	397.5	163	4	1590	64793	1	4
Dresden	48	93	3	144	4464	35	31
Farley	48.5	368	5	242.5	17848	22	9
Fermi	14	47	2	28	658	70	63
Fitzpatrick	32.5	70	3	97.5	2275	55	47.5
Fort Calhoun	49	7	1	49	343	66	65
Fort St. Vrain	19	10	2	38	190	67	68
Ginna	22	4	1	22	88	72	71
Grand Gulf	32	100	4	128	3200	41	39
Haddam Neck	42	84	3	126	3528	43	35
Harris	63	130	4	252	8190	21	20
Hatch	128.5	275	4	514	35338	9	7
Hope Creek	91	114	4	364	10374	12.5	13
Indian Point	8.5	1	1	8.5	8.5	75	75
Kewaunee	44	60	3	132	2640	39	45
LaCrosse	59	1	1	59	59	64	73
LaSalle	88.5	103	4	354	9116	14	17
Limerick	52.5	33	2	105	1733	52.5	53
Maine Yankee	24.5	8	1	24.5	196	71	67
McGuire	53.5	5	1	53.5	268	65	66
Millstone	38.5	84	3	115.5	3234	45	38

Table C.5 Overall Terrestrial Scores and Ranks

Site	Species Subscore	Corridor Length	Scaled Length	Terrestrial Score 1	Terrestrial Score 2	Terrestrial Rank 1	Terrestrial Rank 2
Monticello	35.5	60	3	106.5	2130	49.5	49
Nine Mile Point	31.5	36	2	63	1134	61	60
North Anna	69	132	4	276	9108	19	18
Oconee	138	330	5	690	45540	6	5
Oyster Creek	99	11	2	198	1089	27	61
Palisades	51.5	41	2	103	2112	54	50
Palo Verde	232.5	585	5	1162.5	136013	3	1
Peach Bottom	56.5	30	2	113	1695	46	55
Perry	97.5	93	3	292.5	9068	16	19
Pilgrim	53	34	2	106	1802	51	52
Point Beach	54	210	4	216	11340	25	10
Prairie Island	42.5	78	3	127.5	3315	42	37
Quad Cities	28	125	4	112	3500	47	36
Rancho Seco	168	44	2	336	7392	15	22
River Bend	40	30	2	80	1200	58.5	58.5
Robinson	52.5	84	3	157.5	4410	31	32
Salem	91	106	4	364	9646	12.5	15
San Onofre	250	103	4	1000	25750	5	8
Seabrook	35.5	86	3	106.5	3053	49.5	42
Sequoayah	73	139	4	292	10147	17	14
Shoreham	21	1	1	21	21	73	74
South Texas	248.5	398	5	1242.5	98903	2	3
St. Lucie	307.5	13	2	615	3998	8	34
Summer	36.5	129	4	146	4709	34	29
Surry	54	35	2	108	1890	48	51
Susquehanna	49	60	3	147	2940	33	43
Three Mile Island	58.5	90	3	175.5	5265	29	27
Trojan	118	47	2	236	5546	23	26
Turkey Point	341	19	2	682	6479	7	24
Vermont Yankee	35.5	5	1	35.5	178	68.5	69.5
Vogtle	208	557	5	1040	115856	4	2
Waterford	30.5	24	2	61	732	62	62
Watts Bar	32	300	5	160	9600	30	16
WNP-2	36	10	2	72	360	60	64
Wolf Creek	71.5	151	4	286	10797	18	12
Yankee Rowe	30.5	5	1	30.5	153	68.5	69.5
Zion	77	89	3	231	6853	24	23

**APPENDIX D**

**Site Summaries**

## **D.1 ARKANSAS**

**Priority Level:** Low

**Level of Effort Required:** Moderate

### **Background Information**

**FES Date:** February 1973 (Unit 1); September 1972 (Unit 2)

**Commercial Operation:** 1974 (Unit 1), 1980 (Unit 2)

**Location:** The site is in Pope County, Arkansas. The station is situated on a peninsula on the left bank of the Dardanelle Reservoir (Lake Dardanelle). The site covers 1164 acres.

Total Licensed Thermal Power (MWt): 5383

Cooling System: Unit 1 - Once Through; Unit 2 - Natural Draft Cooling Tower

Water Source: Dardanelle Reservoir

Intake/Discharge: Intake via 981 m canal, discharge via 160 m canal

Length of Transmission lines (miles): 250

### **Consultation History**

No records of previous interactions with USFWS were identified.

**Ranking Results:** Aquatic Score 1: 49.5 Aquatic Score 2: 51

Terrestrial Score 1: 57 Terrestrial Score 2: 28

**Quality of Biological Information Examined:** Low

### **Threatened and Endangered Species Information**

Total # of potential Species: 15 Terrestrial: 10 Aquatic: 5

Species most likely in vicinity of the power plant site or transmission lines:

The bald eagle is the only species likely to be in the vicinity. Other terrestrial species that may also occur include the least tern, red-cockaded woodpecker, American burying beetle, and harperella. No threatened or endangered aquatic species are likely to exist in Dardanelle reservoir or be affected by facility operations. The USFWS indicated that no threatened or endangered species occur in the vicinity of the power plant site.

### **Conclusions:**

No adverse impacts to aquatic species of concern are anticipated. The bald eagle is not likely to be significantly affected by the facility or transmission lines. The other species identified as potentially occurring in the vicinity could be affected by transmission line maintenance, but the available evidence does not suggest that these species either exist in the area or would be affected by transmission line maintenance. Therefore, the potential for significant ESA related issues at this site is considered low.

### **Additional Information Required:**

More precise information about the location of the transmission lines, the habitat types crossed by the lines, and the distribution of the species potentially occurring in the area.



## D.2 ARNOLD

**Priority Level:** Moderate - Low

**Level of Effort Required:** Moderate

### Background Information

**FES Date:** March 1973

**Commercial Operation:** 1975

**Location:** West bank of the Cedar River, Linn County, IA, 8 miles northwest of Cedar Rapids.

Total Licensed Thermal Power (MWt): 1658

Cooling System: Mechanical Draft Cooling Towers

Water Source: Cedar River

Intake/Discharge: Intake from structure on river shore, discharge via canal to shoreline

Length of Transmission lines (miles): 88

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	56	Aquatic Score 2:	59.5
	Terrestrial Score 1:	36	Terrestrial Score 2:	33

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 10      Terrestrial: 7      Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

The bald eagle is known to winter in Linn County and the peregrine falcon is known to breed in Linn County. There is a potential for several remnant prairie plant species to inhabit the transmission line corridors based on historical records. The occurrence of endangered aquatic species in the vicinity of the facility is unlikely.

### Conclusions:

Although the eagle and falcon are known to exist in the vicinity site, these species are not likely to be significantly affected by plant or transmission line operations unless the prey base is being affected, or if there are unusual numbers of electrocutions on transmission lines. The USFWS did not indicate that the remnant prairie species are known from the area, but they are considered potentially occurring throughout Iowa. Therefore, potential issues exist at this site, but the potential for adverse impacts to threatened or endangered species is considered moderate to low.

### Additional Information Required:

Routes of the transmission lines, and habitats traversed by the transmission lines, especially any remnant prairie stands.

### D.3 BEAVER VALLEY

**Priority Level:** Low

**Level of Effort Required:** Moderate to High

#### Background Information

**FES Date:** July 1973

**Commercial Operation:** 1976 (Unit 1), 1987 (Unit 2)

**Location:** South Bank Ohio River, Beaver County, PA, 25 Miles NW of Pittsburgh

Total Licensed Thermal Power (MWt): 5304

Cooling System: Natural Draft Cooling Towers

Water Source: Ohio River

Intake/Discharge: Intake and discharge structures are located on river edge

Length of transmission lines (miles): 28 miles

#### Consultation History

The USFWS indicated in 1983 that species potentially occurring in the vicinity included the bald eagle, peregrine falcon, Kirtland's warbler, Indiana bat, orange-foot pearlymussel, pink mucket pearlymussel, rough pigtoe and small-whorled pogonia. The letter indicated that none of the species would be likely to be affected by facility operation.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	19	Aquatic Score 2:	22
	Terrestrial Score 1:	56	Terrestrial Score 2:	57

**Quality of Biological Information Examined:** Low

#### Threatened and Endangered Species Information

Total # of potential Species: 14      Terrestrial: 7      Aquatic: 7

Species most likely in vicinity of the power plant site or transmission lines:

The bald eagle is probably the only species of concern likely to be found in the vicinity of the power plant or transmission lines, except the peregrine falcon which is known to nest in the City of Pittsburgh. The five endangered mussels identified by the USFWS have not been observed in the Ohio river near the facility since 1919, however the USFWS did indicate that water quality in the Ohio river is improving and that recolonization by these species is possible.

#### Conclusions:

Impacts to aquatic species of concern is unlikely unless one or more of the endangered species recolonizes this portion of the Ohio River. Bald eagles are not documented to currently use the area, and are unlikely to be affected by transmission lines, other than potential electrocutions. Other terrestrial species are unlikely to be either present or affected by facility operation. The potential for adverse impacts to threatened or endangered species is considered low.

#### Additional Information Required:

Surveys for endangered mussel species in the Ohio River.

#### D.4 BIG ROCK POINT

Priority Level: Low

Level of Effort Required: None

##### Background Information

FES Date: None

Commercial Operation: 1963

**Location:** 4 Miles NE of Charlevoix, Charlevoix county, MI, between the towns of Charlevoix and Petoskey, on the northern shore of Michigan's lower peninsula.

Total Licensed Thermal Power (MWt): 240

Cooling System: Once Through

Water Source: Lake Michigan

Intake/Discharge: Intake via underwater crib, discharge via open canal to lake.

Length of transmission lines (miles): unknown, believed to be short

##### Consultation History

No records of previous interactions with USFWS were identified. However, the USFWS indicated that they had provided information concerning the Decommissioning Environmental Report in July, 1995.

##### Ranking Results

Aquatic Score 1: 70.5    Aquatic Score 2: 70.5

Terrestrial Score 1: 74    Terrestrial Score 2: 72

**Quality of Biological Information Examined:** Low

##### Threatened and Endangered Species Information

Total # of potential Species: 2    Terrestrial: 2    Aquatic: 0

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are likely to be in the power plant vicinity. Terrestrial species potentially in the area include piping plovers and Houghton's goldenrod.

##### Conclusions:

The facility is still operating as of February 1997, but the decommissioning process has been initiated. Because the facility will be decommissioned in the near future, adverse impacts are expected to be minimal. There appears to be a low potential for adverse impacts even if the facility were operating. Any additional ESA related issues should be addressed as part of the decommissioning NEPA documentation.

##### Additional Information Required:

No additional information is required.

## D.5 BRAIDWOOD

**Priority Level:** Moderate - High

**Level of Effort Required:** Moderate

### Background Information

**FES Date:** July 1974

**Commercial Operation:** 1988

**Location:** Approximately 50 miles SW of Chicago and 20 miles SSW of Joliet, Illinois in the SW corner of Will County. The site is approximately 3 miles west of the Kankakee River at a point 14 miles upstream from its confluence with the Des Plaines River.

Total Licensed Thermal Power (MWt): 6822

Cooling System: Closed cycle cooling pond

Water Source: Kankakee River

Intake/Discharge: Intake from pond shore, discharge via flume to lake.

Length of transmission lines (miles): 84

### Consultation History

The USFWS provided an information request response in 1983 that indicated that the bald eagle and Indiana Bat may be present in the area, but made no conclusion regarding potential impacts.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	61	Aquatic Score 2:	57
	Terrestrial Score 1:	26	Terrestrial Score 2:	25

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 14    Terrestrial: 13    Aquatic: 1

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are known from the site vicinity. The bald eagle has been documented in the area and the eastern prairie fringed orchid was discovered in a nearby Illinois State nature preserve in 1995. The Hine's emerald dragonfly and several additional remnant prairie plant species (Mead's milkweed, leafy prairie clover, and lakeside daisy) are known to occur in Will County.

### Conclusions:

There are a number of remnant prairie species known to exist in the vicinity of the power plant site and transmission lines, therefore the potential for significant ESA issues is considered moderate to high.

### Additional Information Required:

Precise information about the locations of the transmission lines, the habitats traversed by the lines, and the distribution of the dragonfly and plant species in the vicinity of the power plant and transmission lines.

## D.6 BROWNS FERRY

**Priority Level:** Moderate - Low      **Level of Effort Required:** Moderate to High

### Background Information

**FES Date:** Unit 1 - Sept. 1972, Unit 2 - July 1971, Unit 3 -

**Commercial Operation:** Unit 1 - 1974, Unit 2 - 1975, Unit 3 - 1977

**Location:** 840-acres on the north shore of Wheeler Reservoir, Tennessee River Mile 294, in Limestone County, AL about 10 miles NW of Decatur, AL, and 10 miles SW of Athens, AL.

Total Licensed Thermal Power (MWt): 9879

Cooling System: Once through with helper towers

Water Source: Wheeler Reservoir / Tennessee River

Intake/Discharge: Intake from structure in small inlet, discharge via diffuser pipes

Length of transmission lines (miles): 83

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	30	Aquatic Score 2:	23
	Terrestrial Score 1:	52.5	Terrestrial Score 2:	44

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species:	57	Terrestrial:	22	Aquatic:	35
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Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered species are definitively known to exist in the vicinity of the power plant or transmission lines. The Tennessee river near the site probably had a rich collection of mussels and fishes that are now listed as threatened or endangered, but these species are not likely to be found in Wheeler reservoir, which was built prior to the construction of the Browns Ferry facilities. The USFWS stated that it would be prudent to consider the presence of relict trillium, eastern indigo snake, red-cockaded woodpecker, and bald eagle, but did not indicate that they are likely to be in the area. GEN&SIS identified several other rare plant species in the general area.

### Conclusions:

Although a large number of rare clams and fishes potentially occur in the area, the likelihood is low that they currently inhabit Wheeler reservoir, therefore adverse impacts to rare aquatic species is unlikely. Some rare terrestrial species may be in the area, but there is little evidence that they actually exist in the vicinity of the site or that they may be affected by operations. Therefore, the potential for adverse impacts to threatened or endangered species is considered moderate to low.

### Additional Information Required:

Precise routes of transmission lines and distributions of rare plant and animal species potentially in the area. Data or new surveys for mussels in Wheeler reservoir.

## D.7 BRUNSWICK

**Priority Level:** High

**Level of Effort Required:** Moderate to High

### Background Information

**FES Date:** June 1973

**Commercial Operation:** Unit 1 - 1977, Unit 2 - 1975

**Location:** 6 miles from the Atlantic Ocean (both south and east of the plant), 2 miles west of the Cape Fear River. 16 miles south of Wilmington, NC, and 2.5 miles north of Southport, NC.

Total Licensed Thermal Power (MWt): 4872

Cooling System: Once Through

Water Source: Cape Fear River Estuary

Intake/Discharge: 5km Intake canal from Cape Fear River, 10km discharge canal to Atlantic ocean.

Length of transmission lines (miles): 358

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	2	Aquatic Score 2:	1
	Terrestrial Score 1:	10	Terrestrial Score 2:	6

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 19    Terrestrial: 12    Aquatic: 7

Species most likely in vicinity of the power plant site or transmission lines:

Aquatic species include the West Indian manatee, shortnose sturgeon, and green, loggerhead, and Kemp's ridley sea turtles, the leatherback sea turtle is also possible. The bald eagle, red-cockaded woodpecker, seabeach amaranth, and rough leaf loosestrife are documented near the site. Other threatened or endangered birds and plants are likely in the vicinity of the transmission lines.

### Conclusions:

A number of rare aquatic species are known in the vicinity of the plant. No records of impacts to these species have been identified, and impacts are probably minimized by the canal system used for the intake and discharge of cooling water. However, the number of species potentially affected may warrant more in depth review. The transmission lines are long, and probably traverse a number of habitat types. There are a relatively large number of terrestrial species potentially affected by facility or transmission line operations. Therefore, the potential for adverse impacts to threatened or endangered species is considered high.

### Additional Information Required:

Data concerning population levels of sea turtles, sturgeon, and manatee in the site vicinity, detailed maps of transmission lines, and distribution of known populations and potential habitats for rare species relative to the transmission corridors.



## D.8 BYRON

**Priority Level:** Moderate- High

**Level of Effort Required:** Moderate

### Background Information

**FES Date:** July 1974

**Commercial Operation:** Unit 1 - 1985, Unit 2 - 1987

**Location:** 2.5 miles east of the Rock River and three miles SSW of Byron, in Rockvale Township, Ogle County, Illinois, on the Rock River.

Total Licensed Thermal Power (MWt): 3822

Cooling System: Natural Draft Cooling Towers

Water Source: Rock River

Intake/Discharge: Intake from concrete structure on shoreline, discharge to the river

Length of transmission lines (miles): 54

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	52	Aquatic Score 2:	52
	Terrestrial Score 1:	40	Terrestrial Score 2:	46

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 17      Terrestrial: 14      Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

The prairie bush clover is known to occur in Ogle County, and at least 2 other remnant prairie species (leafy prairie clover and eastern prairie fringed orchid) potentially occur in the area. Wintering bald eagles, and Indiana bats are also possible. The presence of any aquatic species of concern in the vicinity of the facilities is highly unlikely.

### Conclusions:

Adverse impacts to threatened or endangered aquatic species are highly unlikely. Impacts to Indiana bats and bald eagles are unlikely except possibly at points where the transmission lines cross a river or stream. The prairie bush clover and other remnant prairie plant species could be affected by transmission line maintenance. The transmission lines are moderate in length (54 miles), therefore the probability of adverse impacts to terrestrial species of concern may be lower than at sites with longer transmission systems. Therefore, potential ESA issues exist for this site, but the probability of adverse impacts is considered moderate to high.

### Additional Information Required:

Maps of the locations of the transmission lines, the habitats crossed by the lines, and the known distributions of remnant prairie species.

## D.9 CALLAWAY

**Priority Level:** Moderate - Low

**Level of Effort Required:** Moderate to High

### Background Information

**FES Date:** March 1975

**Commercial Operation:** 1984

**Location:** Callaway County, MO, 10 miles SE of Fulton and 5 miles N of the Missouri River.

Total Licensed Thermal Power (MWt): 3565

Cooling System: Natural Draft Cooling Towers

Water Source: Missouri River

Intake/Discharge: Intake and discharge to river

Length of transmission lines (miles): 50

### Consultation History

The USFWS recommended in 1980 that a biological assessment be prepared to address potential impacts to bald eagle, peregrine falcon, and pink mucket pearlymussel. No record of this biological assessment has been found.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	24	Aquatic Score 2:	26
	Terrestrial Score 1:	37	Terrestrial Score 2:	47.5

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 16    Terrestrial: 9    Aquatic: 7

Species most likely in vicinity of the power plant site or transmission lines:

The bald eagle is known to winter in the vicinity of the site, and at least one potentially active nest is within 10 miles of the power plant site. Indiana and gray bats are known to occasionally be in the area. Aquatic species known to be in the vicinity of the power plant include the pink mucket pearlymussel, the pallid sturgeon and 2 candidate species (the sicklefin and sturgeon chubs).

### Conclusions:

Although several aquatic species of concern occur in the site vicinity, direct impacts are probably minimal because the facility is relatively small and uses a closed cycle cooling system. The USFWS indicated that the pink mucket pearlymussel occurs in the Gasconade River, near the point where transmission lines cross that river. Impacts to eagles and bats are probably minimal except possibly at points where transmission lines cross rivers or streams. There are potential ESA issues associated with this plant, but the potential for adverse impacts is considered moderate to low.

### Additional Information Required:

Detailed maps of transmission lines, especially near the Gasconade river. Surveys for sicklefin and sturgeon chubs and pallid sturgeon near the plant, and data concerning potential impingement / entrainment of these species.

## D.10 CALVERT CLIFFS

**Priority Level:** Moderate - Low      **Level of Effort Required:** Moderate to Low

### Background Information

**FES Date:** April 1973

**Commercial Operation:** Unit 1 - 1975, Unit 2 - 1977

**Location:** West shore of Chesapeake Bay, Calvert County, MD, near Lusby, Md.

Total Licensed Thermal Power (MWt): 5400

Cooling System: Once Through

Water Source: Chesapeake Bay

Intake/Discharge: Intake about 170 m from shore, discharge about 260 m from shore

Length of transmission lines (miles): 47

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	14	Aquatic Score 2:	8
	Terrestrial Score 1:	38	Terrestrial Score 2:	40

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 21      Terrestrial: 13      Aquatic: 8

Species most likely in vicinity of the power plant site or transmission lines:

Aquatic species known to occur in the area include Kemp's ridley and loggerhead sea turtles. Terrestrial species known to occur within 10 miles of the power plant include the bald eagle which is known to nest within 2 miles of the plant, swamp pink, and the Delmarva peninsula fox squirrel. Both the northeastern and puritan tiger beetles are present on the site property itself, and the utility has worked with The Nature Conservancy and the Maryland Natural Heritage Program to develop a management and monitoring plan for these species.

### Conclusions:

There are sea turtles present near the facility, but apparently there have been no takes during 20 years of facility operation, indicating that impacts are probably small. The tiger beetles on site are currently managed, and are monitored by independent organizations. The USFWS indicated that the swamp pink and fox squirrel are not likely to be affected by the facility or the transmission lines. Bald eagles could be indirectly affected by alterations to the food chain, or by maintenance of the transmission lines. Therefore, there are potential ESA issues at this site, but the probability of adverse affects on threatened or endangered species is considered moderate to low. Also, potential ESA issues will be addressed in depth as part of the planned license renewal.

### Additional Information Required:

Population levels of sea turtles in the vicinity of the facilities.

## **D.11 CATAWBA**

**Priority Level: Moderate - Low**

**Level of Effort Required: Moderate**

### **Background Information**

**FES Date:** January 1983

**Commercial Operation:** Unit 1 - 1985, Unit 2 - 1986

**Location:** The site is located on a peninsula in Lake Wylie about 7.2 km (4.5 mi.) NW of Wylie Dam, York County, SC, and approximately 9.6 km (6 mi.) north of Rock Hill, SC.

Total Licensed Thermal Power (MWt): 6822

Cooling System: Mechanical Draft Cooling Towers

Water Source: Lake Wylie reservoir

Intake/Discharge: Intake via skimmer wall at lake shore, discharge to separate cove of lake.

Length of transmission lines (miles): 28.5

### **Consultation History**

A letter requesting threatened and endangered species information was sent to the USFWS in 1981, and the FES indicates that the response stated that there were no known threatened, endangered, or proposed species in the project area.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	54.5	Aquatic Score 2:	55
	Terrestrial Score 1:	44	Terrestrial Score 2:	54

**Quality of Biological Information Examined: Low**

### **Threatened and Endangered Species Information**

Total # of potential Species: 23    Terrestrial: 21    Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

The USFWS indicated that the bald eagle, little amphianthus, and Schweinitz's sunflower are known to occur in York County. The GEN&SIS runs indicated that several additional rare plant species may be in the vicinity of the power plant site or transmission lines. No threatened or endangered aquatic species are likely to occur in Lake Wylie.

### **Conclusions:**

There is a potential for adverse impacts to threatened or endangered plant species and bald eagles along the transmission line corridors, but the length of the transmission lines is relatively short. The potential for adverse affects to rare aquatic species is minimal. Therefore, there are potential ESA issues associated with this site, but the probability of adverse impacts to threatened or endangered species is considered moderate.

### **Additional Information Required:**

Precise maps of the transmission lines, habitats in the area, and known distributions of threatened and endangered plant species.

## **D.12 CLINTON**

**Priority Level:** Low

**Level of Effort Required:** Moderate

### **Background Information**

**FES Date:** October 1974

**Commercial Operation:** 1987

**Location:** DeWitt County in central Illinois near the confluence of Salt Creek and its North Fork, about six miles east of the city of Clinton.

Total Licensed Thermal Power (MWt): 2894

Cooling System: Once through

Water Source: Salt Creek (Small river)

Intake/Discharge: Intake via concrete structure on North Salt creek, discharge via 5-km flume to Salt Creek

Length of transmission lines (miles): 40

### **Consultation History**

No records of previous interactions with USFWS were identified.

### **Ranking Results**

Aquatic Score 1: 61      Aquatic Score 2: 58

Terrestrial Score 1: 63      Terrestrial Score 2: 58.5

**Quality of Biological Information Examined:** Low

### **Threatened and Endangered Species Information**

Total # of potential Species: 7      Terrestrial: 6      Aquatic: 1

Species most likely in vicinity of the power plant site or transmission lines:

The only threatened or endangered species likely to be in the vicinity is the bald eagle. The Indiana bat is possible, but is probably very rare in the area. A few remnant prairie plant species may occur at the outer reaches of the transmission lines. No threatened or endangered aquatic species are known from the vicinity of the plant.

### **Conclusions:**

Adverse impacts to rare aquatic organisms is highly unlikely. Bald eagles do occasionally winter in the area, but adverse impacts to that species is unlikely. The rare plant species were identified by GEN&SIS at a distance of greater than 20 miles from the site, and most of the transmission lines are within 20 miles of the site. Therefore, the probability of adverse impacts to any threatened or endangered species is low.

### **Additional Information Required:**

Distribution of remnant prairie species and potential habitats in relation to the transmission lines.

### D.13 COMANCHE PEAK

**Priority Level:** Moderate - Low

**Level of Effort Required:** Moderate

#### Background Information

**FES Date:** September 1981, Supplement October 1989

**Commercial Operation:** Unit 1 - 1990, Unit 2 - 1993

**Location:** Adjacent to Squaw Creek Reservoir, in Somervell County, TX. Near border with Hood County TX. Approximately 5 miles N of Glen Rose TX.

Total Licensed Thermal Power (MWt): 6822

Cooling System: Once Through

Water Source: Squaw Creek Reservoir

Intake/Discharge: Intake from shore of reservoir, discharge via canal to reservoir.

Length of transmission lines (miles): 14

#### Consultation History

USFWS letter in 1980 indicated that no threatened or endangered species would be affected by the facility operations.

**Ranking Results**    Aquatic Score 1:        70.5    Aquatic Score 2:        70.5

Terrestrial Score 1:    28        Terrestrial Score 2:    56

**Quality of Biological Information Examined:** Moderate

#### Threatened and Endangered Species Information

Total # of potential Species:    10        Terrestrial:        10        Aquatic:        0

Species most likely in vicinity of the power plant site or transmission lines:

Species that are likely to be in the vicinity include the bald eagle, black-capped vireo, golden-cheeked warbler, and mountain plover. Whooping cranes pass through the area during migration. wood storks, least terns, and peregrine falcons are less likely to be in the area. There are no threatened or endangered aquatic species known in the vicinity of the plant.

#### Conclusions:

Adverse impacts to aquatic threatened or endangered species are unlikely. Transmission line maintenance could affect habitat for a number of rare bird species. However, the transmission corridors are short. Therefore, there are potential ESA issues associated with this site, but the potential for adverse impacts to threatened or endangered species is considered moderate to low.

#### Additional Information Required:

Habitats along the transmission corridors, and distribution of the rare bird species near the transmission lines.

#### D.14 COOK

Priority Level: Moderate - High

Level of Effort Required: Moderate

##### Background Information

FES Date: August 1973

Commercial Operation: Unit 1 - 1975, Unit 2 - 1978

Location: Lake Township, Berrien County, about two miles northeast of Bridgman, Michigan.

Total Licensed Thermal Power (MWt): 6661

Cooling System: Once Through

Water Source: Lake Michigan

Intake/Discharge: Intake crib 686 m from shore, discharge 381 m from shore

Length of transmission lines (miles): 155

##### Consultation History

No records of previous interactions with USFWS were identified.

##### Ranking Results

Aquatic Score 1: 48      Aquatic Score 2: 46

Terrestrial Score 1: 58.5      Terrestrial Score 2: 41

Quality of Biological Information Examined: Low

##### Threatened and Endangered Species Information

Total # of potential Species: 15      Terrestrial: 13      Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic are known from the site vicinity and no rare terrestrial species are likely to be found in the near vicinity of the plant. Pitcher's thistle and the small-whorled pogonia may occur along transmission lines. The tubercle-blossom pearly mussel and the clubshell may occur in streams crossed by the transmission lines - primarily in Indiana.

##### Conclusions:

Adverse impacts to threatened or endangered aquatic species are highly unlikely. Pitcher's thistle and small-whorled pogonia may occur along transmission lines, and two mussel species may be affected at transmission line river crossings in Indiana. The USFWS response for this site did not include information about the Indiana portions of the transmission lines. Therefore, there are potential ESA issues associated with this plant, and the potential for adverse impacts to these species is considered moderate to high.

##### Additional Information Required:

More information about the location of the transmission lines, especially in Indiana, and the distribution of the rare plant and mussel species.



**D.15 COOPER**

**Priority Level:** High

**Level of Effort Required:** Moderate to High

**Background Information**

**FES Date:** February 1973

**Commercial Operation:** 1974

**Location:** West Bank of Missouri River, at River mile 532.5, Nemaha County, NE.

Total Licensed Thermal Power (MWt): 2381

Cooling System: Once Through

Water Source: Missouri River

Intake/Discharge: Intake and discharge at shoreline

Length of transmission lines (miles): 159

**Consultation History**

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	16	Aquatic Score 2:	13
	Terrestrial Score 1:	20	Terrestrial Score 2:	11

**Quality of Biological Information Examined:** Low

**Threatened and Endangered Species Information**

Total # of potential Species: 12    Terrestrial: 9    Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

Aquatic species known to occur in the Missouri river near the plant include the pallid sturgeon, and the sicklefin and sturgeon chubs. Bald eagles are known to winter near the site, and may nest in the area. Whooping cranes pass by portions of the transmission corridors during migration. Other species known to nest in the area include the least tern and piping plovers, and peregrine falcons are known to migrate through the area. Other species potentially affected along the transmission lines include the American burying beetle and the western prairie fringed orchid.

**Conclusions:**

There are potential adverse impacts to a number of terrestrial and aquatic threatened or endangered species. The potential for adverse impacts to these species is considered high..

**Additional Information Required:**

More detailed survey data for fish species near the intake and discharge structures, analysis of entrainment / impingement - especially for the small chub species. Locations of nesting colonies of terns and plovers, the use of the area by roosting and or nesting eagles, and data on collisions of whooping cranes with the transmission lines. Distribution of the American burying beetle and prairie fringed orchid in relation to the transmission lines.

## D.16 CRYSTAL RIVER

**Priority Level:** Moderate - High      **Level of Effort Required:** Moderate to High

### Background Information

**FES Date:** May 1973

**Commercial Operation:** 1977

**Location:** NW corner of Citrus County, FL, on the Gulf of Mexico halfway between the Withlacoochee and Crystal Rivers. Approximately 7.5 miles NW of the town of Crystal River.

Total Licensed Thermal Power (MWt): 2544

Cooling System: Once Through

Water Source: Gulf of Mexico

Intake/Discharge: Intake via 4.9 km canal, discharge is via 4 km canal

Length of transmission lines (miles): 125

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	11	Aquatic Score 2:	16
	Terrestrial Score 1:	32	Terrestrial Score 2:	30

**Quality of Biological Information Examined:** Moderate

### Threatened and Endangered Species Information

Total # of potential Species: 43      Terrestrial: 34      Aquatic: 9

Species most likely in vicinity of the power plant site or transmission lines:

Rare aquatic species known from the vicinity of the site include the West Indian manatee, and the green, loggerhead, and Kemp's ridley sea turtles. The gulf sturgeon and hawksbill sea turtle also are potentially in the area. Bald eagles are known from the area; other terrestrial species that may be affected by transmission line maintenance include the eastern indigo snake, Florida scrub jay, red-cockaded woodpecker, wood stork, and the everglades snail kite. The GEN&SIS runs identified over 20 rare plant species that may be affected by transmission line operation and maintenance.

### Conclusions:

Sea turtles, manatees, and gulf sturgeon may be affected by operations. The transmission lines are relatively long, therefore the potential exists for adverse impacts to a number of terrestrial threatened or endangered species. Overall the potential for adverse impacts to threatened or endangered species is considered moderate to high.

### Additional Information Required:

Detailed information about the location of the transmission corridors, the habitats crossed by the lines, and the distribution of rare species in relation to these lines. Population levels of sea turtles, sturgeon, and manatees in the vicinity of the intake and discharge canals.

**D.17 DAVIS-BESSE**

**Priority Level: Moderate - High**

**Level of Effort Required: Moderate**

**Background Information**

**FES Date:** March 1973, October 1975

**Commercial Operation:** 1978

**Location:** Carroll Township, Ottawa County, just north of the Toussaint River. 21 miles WNW of Toledo, and 21 miles SE of Sandusky.

Total Licensed Thermal Power (MWt): 2772

Cooling System: Natural Draft Cooling towers

Water Source: Lake Erie

Intake/Discharge: Intake is 900 m offshore, discharge is 280 m from the shore.

Length of transmission lines (miles): 57

**Consultation History**

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	64	Aquatic Score 2:	64
	Terrestrial Score 1:	11	Terrestrial Score 2:	21

**Quality of Biological Information Examined: Low**

**Threatened and Endangered Species Information**

Total # of potential Species: 12    Terrestrial: 10    Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

There are no threatened or endangered aquatic species that are likely to be in the site vicinity.

Terrestrial species known to be in the vicinity include the bald eagle, Indian bat, piping plover, peregrine falcon, Karner blue butterfly, Lake Erie water snake, lakeside daisy, and eastern prairie fringed orchid.

**Conclusions:**

Adverse impacts to rare aquatic species are highly unlikely. Operation and maintenance of the transmission lines has the potential to impact a number of threatened or endangered terrestrial species, therefore the potential for adverse impacts is considered moderate to high.

**Additional Information Required:**

The distribution of the known rare terrestrial species in relation to the transmission corridors, the habitats in the vicinity of the transmission lines, and more detailed information about the location of the transmission lines.

## D.18 DIABLO CANYON

**Priority Level:** High

**Level of Effort Required:** High

### Background Information

**FES Date:** May 1973

**Commercial Operation:** Unit 1 - 1985, Unit 2 - 1986

**Location:** Shore of Pacific Ocean, San Luis Obispo County, CA, 12 WSW of the Town of San Luis Obispo, 7 miles WNW of Avila Beach.

Total Licensed Thermal Power (MWt): 6749

Cooling System: Once Through

Water Source: Pacific Ocean

Intake/Discharge: Intake via cove with artificial breakwater, discharge via stairstep, 21 m weir.

Length of transmission lines (miles): 163

### Consultation History

Consultations in 1980 concerning Gray whale, Brown pelican, least tern, sea otter, and peregrine falcon. USFWS/NMFS determined that the facility was unlikely to adversely affect these species.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	1	Aquatic Score 2:	2
	Terrestrial Score 1:	1	Terrestrial Score 2:	4

**Quality of Biological Information Examined:** Moderate - High

### Threatened and Endangered Species Information

Total # of potential Species: 94      Terrestrial: 79      Aquatic: 15

Species most likely in vicinity of the power plant site or transmission lines:

Green sea turtles have recently been taken at the intake structure. Other known aquatic species include southern sea otter, gray whale, and olive ridley sea turtle. Several other sea turtles also may be in the area. A large number of endangered or threatened terrestrial species are potentially affected, including the brown pelican, least bell's vireo, peregrine falcon, California red-legged frog, California tiger salamander, the Morro Bay, Fresno, Tipton and giant kangaroo rats, San Joaquin kit fox, blunt nosed leopard lizard, giant garter snake, Morro shoulderband snail, and between 20 and 40 threatened or endangered plant species.

### Conclusions:

The potential for both direct and indirect effects on rare aquatic species is considered high. There are many rare terrestrial species potentially affected by the facility or operation and maintenance of transmission lines, which are relatively long. Habitat heterogeneity in this area is high. Therefore, the potential for adverse impacts to threatened or endangered species is very high.

### Additional Information Required:

Detailed maps of the routes and locations of the transmission lines, the habitats along the corridors, and the distribution of each of the rare terrestrial species in relation to the transmission lines. Data about effects on near shore ecology and population levels of rare aquatic species in the area.

## D.19 DRESDEN

**Priority Level:** Moderate - Low

**Level of Effort Required:** Moderate

### Background Information

**FES Date:** November 1973

**Commercial Operation:** Unit 1 - 1970, Unit 2 - 1971

**Location:** Goose Lake Township, Grundy County, Illinois, 50 miles SW of downtown Chicago. On the south shore of the Illinois River and the west shore of the Kankakee River where the Kankakee and Des Plaines Rivers join to form the Illinois River. About half of the cooling lake is located in Wilmington Township of Will County, IL.

Total Licensed Thermal Power (MWt): 5054

Cooling System: Cooling Lake and Spray canal

Water Source: Kankakee River

Intake/Discharge: Intake via canal from Kankakee river, discharge is canal to cooling lake with floating spray modules, overflow returns to Illinois River.

Length of transmission lines (miles): 93

### Consultation History

Information from USFWS in 1983 and 1989 indicated that bald Eagle, Lakeside Daisy, and eastern prairie fringed orchid were in vicinity, but that adverse impacts were unlikely.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	70.5	Aquatic Score 2:	70.5
	Terrestrial Score 1:	35	Terrestrial Score 2:	31

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 12    Terrestrial: 12    Aquatic: 0

Species most likely in vicinity of the power plant site or transmission lines:

No rare aquatic species are known from the site vicinity. Bald eagles winter near the site, other potential species include the Indian bat, eastern prairie fringed orchid, and the decurrent false aster.

### Conclusions:

Adverse affects to rare aquatic species is considered highly unlikely. Bald eagles winter in the area but the potential for adverse impacts is probably low. The eastern prairie fringed orchid is only known from historical records in Grundy County. The decurrent false aster occurs in disturbed alluvial soils in the floodplain for the Illinois river, it could be affected by transmission line maintenance. Therefore, potential ESA issues are associated with this site, but the probability of adverse impacts to threatened or endangered species is considered moderate to low.

### Additional Information Required:

Detailed locations of transmission lines, habitat types along corridors and known distributions of decurrent false aster, and eastern prairie fringed orchid.

## **D.20 FARLEY**

**Priority Level: Moderate - High**

**Level of Effort Required: Moderate**

### **Background Information**

**FES Date:** June 1972 / December 1974

**Commercial Operation:** Unit 1 - 1977, Unit 2 - 1981

**Location:** Southeastern corner of Alabama on the west side of the Chattahoochee River in Houston County, 16.5 miles directly east of Dothan. The site consists of about 1850 acres.

Total Licensed Thermal Power (MWt): 5304

Cooling System: Mechanical Draft Cooling Towers

Water Source: Chattahoochee River

Intake/Discharge: Intake from river via storage pond, discharge at river bank.

Length of transmission lines (miles): 368

### **Consultation History**

No records of previous interactions with USFWS were identified.

### **Ranking Results**

Aquatic Score 1: 45.5    Aquatic Score 2: 44

Terrestrial Score 1: 22    Terrestrial Score 2: 9

**Quality of Biological Information Examined: Moderate**

### **Threatened and Endangered Species Information**

Total # of potential Species: 27    Terrestrial: 24    Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered species were definitively identified as occurring near the site. The gulf sturgeon potentially inhabits the river near the plant. Terrestrial species potentially occurring near the power plant or transmission lines include the bald eagle, red-cockaded woodpecker, wood stork, eastern indigo snake, and a number of plant species - especially the relict trillium.

### **Conclusions:**

Adverse impacts to rare aquatic species is unlikely, even if the gulf sturgeon is present, because of the closed cycle cooling system that draws water from a storage pond. The transmission lines are long, therefore interactions with one or more of the rare terrestrial species is likely. Therefore, the potential for adverse impacts to threatened or endangered species is considered moderate to high.

### **Additional Information Required:**

Detailed information about the routing of the transmission lines, the habitats encountered along the lines, and the distribution of threatened or endangered terrestrial species in relation to the transmission lines.

## **D.21 FERMI**

**Priority Level:** Low

**Level of Effort Required:** Moderate

### **Background Information**

**FES Date:** July 1972

**Commercial Operation:** 1988

**Location:** Lagoon Beach, Frenchtown Township, Monroe County, Michigan, midway between Detroit and Toledo on the western shore of Lake Erie.

Total Licensed Thermal Power (MWt): 3292

Cooling System: Natural Draft Cooling Towers

Water Source: Lake Erie

Intake/Discharge: Intake at edge of lake, discharge to lake via 20-ha holding pond.

Length of transmission lines (miles): 47

### **Consultation History**

Letter from USFWS in 1981 indicated that no threatened or endangered species were known from the site vicinity.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	53	Aquatic Score 2:	53
	Terrestrial Score 1:	70	Terrestrial Score 2:	63

**Quality of Biological Information Examined:** Low

### **Threatened and Endangered Species Information**

Total # of potential Species: 13    Terrestrial: 10    Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

No rare aquatic species are likely to be in the site vicinity. No threatened or endangered terrestrial species are definitively known from the site vicinity, but the bald eagle and the eastern prairie fringed orchid are potentially in the area. The GEN&SIS runs identified several additional plant and insect species that may be in the area.

### **Conclusions:**

Adverse impacts to threatened or endangered aquatic species are highly unlikely. Bald eagles are probably not significantly impacted by facility operations, but the fringed orchid and other plant and insect species could be impacted by transmission line maintenance if any native habitat remains in the Detroit - Toledo corridor. Therefore, potential ESA issues are associated with this site, but the potential for adverse affects to threatened or endangered species is considered low.

### **Additional Information Required:**

Maps of the transmission lines, habitats along these lines, and potential distribution of rare plant and insect species.



## D.22 FITZPATRICK

Priority Level: Low

Level of Effort Required: Moderate

### Background Information

FES Date: March 1973

Commercial Operation: 1975

Location: South Shore of Lake Ontario, at Nine-Mile Point, near Scriba, NY, Oswego County.  
7 Miles east of Oswego, NY, 36 miles NE of Syracuse, NY.

Total Licensed Thermal Power (MWt): 2436

Cooling System: Once Through

Water Source: Lake Ontario

Intake/Discharge: Intake and discharge directly to lake

Length of transmission lines (miles): 70

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	70.5	Aquatic Score 2:	70.5
	Terrestrial Score 1:	55	Terrestrial Score 2:	47.5

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 8      Terrestrial: 8      Aquatic: 0

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are known from the site vicinity. The terrestrial species most likely to be found near the site or transmission lines is the bog turtle. The bald eagle may migrate through the area. GEN&SIS indicated the potential presence of piping plovers, Indiana bats, and 3 plant species - Leedy's roseroot, small-whorled pogonia, and American hart's-tongue fern.

### Conclusions:

Adverse impacts to rare aquatic species is considered highly unlikely. Bog turtles and perhaps the plant species may be affected in areas where the transmission lines cross suitable habitat. The bald eagle apparently only migrates through the area, and is unlikely to be affected by facility operations. Therefore, the potential for adverse impacts to threatened or endangered species is considered low.

### Additional Information Required:

Transmission line routes, habitats encountered along lines, bog turtle distribution, and known distributions and habitat needs of the plant species potentially occurring in the area.

### **D.23 FORT CALHOUN**

**Priority Level:** Moderate -Low

**Level of Effort Required:** Moderate to High

#### **Background Information**

**FES Date:** August 1972

**Commercial Operation:** 1974

**Location:** West Bank of Missouri River, 19 Miles NNW of Omaha, in Washington County, NE.

Total Licensed Thermal Power (MWt): 1500

Cooling System: Once Through

Water Source: Missouri River

Intake/Discharge: Intake and discharge from river shore.

Length of transmission lines (miles): 7

#### **Consultation History**

No records of previous interactions with USFWS were identified.

#### **Ranking Results**

Aquatic Score 1:	21.5	Aquatic Score 2:	32
Terrestrial Score 1:	66	Terrestrial Score 2:	65

**Quality of Biological Information Examined:** Low

#### **Threatened and Endangered Species Information**

Total # of potential Species: 11      Terrestrial: 8      Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

Aquatic species known to occur in the vicinity include the pallid sturgeon and the sicklefin and sturgeon chubs. Terrestrial species that are likely to be in the area include wintering and potentially nesting bald eagles, peregrine falcons, least terns, piping plovers, American burying beetles, and western prairie fringed orchids.

#### **Conclusions:**

The primary concern is with the potential affects on the sturgeon and chubs. A number of terrestrial species may be in the area, but the transmission lines are short, greatly reducing the probability of adverse impacts. Therefore, the potential for adverse impacts to threatened or endangered species is considered moderate.

#### **Additional Information Required:**

More detailed survey data for fish species near the intake and discharge structures, analysis of entrainment / impingement history - especially for the small chub species.

**D.24 FORT ST. VRAIN**

**Priority Level: Low**

**Level of Effort Required: None**

**Background Information**

**FES Date:** August 1972

**Commercial Operation:**

**Location:** SW corner of Weld County, CO. 2 miles S of confluence of S. Platte River and St. Vrain Creek. 3.5 miles NW of Platteville, CO, 35 Miles N of Denver.

Total Licensed Thermal Power (MWt):

Cooling System:

Water Source:

Intake/Discharge:

Length of transmission lines (miles): 10

**Consultation History**

No records of previous interactions with USFWS were identified.

**Ranking Results**

Aquatic Score 1: 70.5    Aquatic Score 2: 70.5

Terrestrial Score 1: 67    Terrestrial Score 2: 68

**Quality of Biological Information Examined: Moderate**

**Threatened and Endangered Species Information**

Total # of potential Species: 3    Terrestrial: 3    Aquatic: 0

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are known from the vicinity. Bald eagles and peregrine falcons are probably the only rare terrestrial species in the area.

**Conclusions:**

The facility is being decommissioned, therefore impacts to threatened or endangered aquatic species, even if present, are minimal. Eagles and falcons are probably not affected by plant operations or transmission line operation and maintenance. The transmission lines are short, therefore potential impacts to species not identified as potentially being present are unlikely. Therefore, the potential for adverse impacts to threatened or endangered species is considered low.

**Additional Information Required:**

none.

**D.25 GINNA**

**Priority Level:** Low

**Level of Effort Required:** Low

**Background Information**

**FES Date:** December 1973

**Commercial Operation:** 1970

**Location:** Northwest Corner of Wayne County, NY, in Ontario, NY. South Shore of Lake Ontario, 20 miles ENE of center of Rochester, 45 miles WSW of Oswego.

Total Licensed Thermal Power (MWt): 1520

Cooling System: Once Through

Water Source: Lake Ontario

Intake/Discharge: Intake from Lake bottom, 940 meters from shore, discharge via canal to lake

Length of transmission lines (miles): 3.5

**Consultation History**

Letter from USFWS in 1982 indicated that no threatened or endangered species were in the area, therefore no adverse affects would result from facility operations.

**Ranking Results**

Aquatic Score 1: 70.5    Aquatic Score 2: 70.5

Terrestrial Score 1: 72    Terrestrial Score 2: 71

**Quality of Biological Information Examined:** Low

**Threatened and Endangered Species Information**

Total # of potential Species: 7    Terrestrial: 7    Aquatic: 0

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are known to occur in the vicinity of the plant. The only terrestrial species likely to be in the are is the bog turtle. Bald eagles may occasionally migrate through the area.

**Conclusions:**

Adverse impacts to rare aquatic species is considered highly unlikely. The transmission lines are very short, therefore the potential for adverse impacts to bog turtles or any other terrestrial species of concern is considered low.

**Additional Information Required:**

Bog turtle habitat survey along transmission line corridor.

## D.26 GRAND GULF

Priority Level: Low

Level of Effort Required: Moderate to High

### Background Information

FES Date: August 1973

Commercial Operation: 1985

Location: Clairborne County, MS on a 2300-acre site on the east bank of the Mississippi River (River Mile 406) about 25 miles south of Vicksburg, MS, and 37 miles north of Natchez, MS.

Total Licensed Thermal Power (MWt): 3833

Cooling System: Natural Draft Cooling Towers

Water Source: Mississippi River

Intake/Discharge: Intake via radial collector wells at river shore, discharge to river via barge slip.

Length of transmission lines (miles): 100

### Consultation History

Biological assessment prepared in 1981 concluded that there would be no adverse impacts to alligators, red-cockaded woodpeckers, or the bayou darter.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	43	Aquatic Score 2:	40.5
	Terrestrial Score 1:	41	Terrestrial Score 2:	39

**Quality of Biological Information Examined:** High

### Threatened and Endangered Species Information

Total # of potential Species: 13      Terrestrial: 10      Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

Species most likely to occur in the vicinity of the site are the bayou darter and the red-cockaded woodpecker. The ringed map turtle may occur in areas near the transmission lines. The pallid and gulf sturgeons may be present near the site.

### Conclusions:

Adverse impacts to aquatic species are probably minimal because of relatively little make-up water is required by the closed cycle cooling system. An assessment of red-cockaded woodpecker habitat and presence was to be conducted during the 1970's. This assessment has not been examined, but since the 1981 biological assessment concluded that there would be no adverse impacts to this species it is assumed that the transmission lines do not cross suitable habitat. Impacts to other species potentially present are unknown, but the potential for adverse impacts to other species is considered low.

### Additional Information Required:

Distribution of ringed-map turtle and red-cockaded woodpecker habitat in relation to transmission lines. Survey data for Bayou Darter.

## D.27 HADDAM NECK

**Priority Level:** Low

**Level of Effort Required:** Low

### Background Information

**FES Date:** October 1973

**Commercial Operation:** 1968

**Location:** East shore of the Connecticut River, Middlesex county, CT, 22 miles SSE of Hartford, 16 miles N of Long Island Sound.

Total Licensed Thermal Power (MWt): 1825

Cooling System: Once through

Water Source: Intake at shoreline, discharge via 1.6 km canal to river.

Intake/Discharge:

Length of transmission lines (miles): 84

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	36	Aquatic Score 2:	36
	Terrestrial Score 1:	43	Terrestrial Score 2:	35

**Quality of Biological Information Examined:** Moderate

### Threatened and Endangered Species Information

Total # of potential Species: 14    Terrestrial: 13    Aquatic: 1

Species most likely in vicinity of the power plant site or transmission lines:

The shortnose sturgeon probably occurs in the vicinity of the plant. Puritan tiger beetles are known to occur along the Connecticut river upstream from power plant site. Bald eagles are known to winter along the Connecticut river.

### Conclusions:

The facility has ceased operations, and it has been permanently de-fueled. There have apparently been no recorded takes of shortnose sturgeon during the 28 years of operation, therefore direct impacts to this species have probably been minimal. Wintering eagles are probably not significantly affected by the power plant or transmission lines, and the puritan tiger beetle would only be affected at the point where the transmission lines cross the Connecticut river if this crossing is at or near the known population locations. Therefore, the potential for adverse impacts to threatened or endangered species is considered low.

### Additional Information Required:

The location of where the transmission lines cross the Connecticut river in relation to the locations of the puritan tiger beetle populations.

## D.28 HARRIS

Priority Level: High

Level of Effort Required: Moderate to High

### Background Information

FES Date: March 1974

Commercial Operation: 1987

Location: 10,744 acres in the extreme southwest corner of Wake County, NC, and the southeast corner of Chatham County, NC, 20 miles SW of Raleigh, and 40 miles north of Fayetteville, NC

Total Licensed Thermal Power (MWt): 2775

Cooling System: Natural Draft Cooling Towers

Water Source: Buckhorn Creek

Intake/Discharge: Intake and discharge to shoreline of reservoir on Buckhorn Creek.

Length of transmission lines (miles): 130

### Consultation History

The USFWS in 1982 listed bald eagles, red-cockaded woodpecker, and Harperella and Michaux's sumac, and suggested that a biological assessment be prepared. Further records were not found.

<u>Ranking Results</u>	Aquatic Score 1:	41	Aquatic Score 2:	40.5
	Terrestrial Score 1:	21	Terrestrial Score 2:	20

Quality of Biological Information Examined: Moderate

### Threatened and Endangered Species Information

Total # of potential Species: 15    Terrestrial: 11    Aquatic: 4

Species most likely in vicinity of the power plant site or transmission lines:

The Cape Fear shiner is known to occur in the area, and critical habitat for this species falls within 10 miles of the power plant site. The red-cockaded woodpecker is known to inhabit the power plant site, and dense populations are likely in forests surrounding the site. Other species likely to be in the area include the dwarf wedge mussel, bald eagle, Michaux's sumac, and harperella. GEN&SIS identified several additional rare plant species that may occur near transmission lines.

### Conclusions:

The Cape Fear shiner probably does not inhabit the cooling reservoir, but may be present where the transmission lines cross several rivers, the same is potentially true for the dwarf wedge mussel. The red-cockaded woodpecker occurs on site and in the surrounding areas and could be affected by habitat disturbance. The rare plant species may be affected by transmission line maintenance. Therefore the potential for adverse impacts to threatened or endangered species is considered high.

### Additional Information Required:

The distribution of Cape Fear Shiner populations and critical habitat, the distribution of rare plant species in relation to the transmission lines and habitats crossed, and facility operating and transmission line maintenance procedures - and how they may affect red-cockaded woodpeckers.



## **D.29 HATCH**

**Priority Level:** High

**Level of Effort Required:** Moderate to High

### **Background Information**

**FES Date:** October 1972

**Commercial Operation:** Unit 1 - 1975, Unit 2 - 1979

**Location:** Northwestern part of Appling County, Georgia, 75 miles west of Savannah, GA, 48 miles north of Waycross, GA. About 2244 acres on both sides of the Altamaha River.

Total Licensed Thermal Power (MWt): 4872

Cooling System: Mechanical Draft Cooling Towers

Water Source: Altamaha River

Intake/Discharge: Intake from structure at river edge, discharge 37 m from shoreline

Length of transmission lines (miles): 275

### **Consultation History**

No records of previous interactions between NRC and USFWS were identified.

**Ranking Results**      Aquatic Score 1:      33      Aquatic Score 2:      35

Terrestrial Score 1:      9      Terrestrial Score 2:      7

**Quality of Biological Information Examined:** Moderate

### **Threatened and Endangered Species Information**

Total # of potential Species:    15      Terrestrial:      14      Aquatic:      1

Species most likely in vicinity of the power plant site or transmission lines:

Species known to be in the vicinity include the shortnose sturgeon, bald eagle, red-cockaded woodpecker, wood stork, eastern indigo snake, hairy rattlesnake, pondberry, and relict trillium.

### **Conclusions:**

The potential for adverse impacts to shortnose sturgeon is considered low because of the closed cycle cooling system. The transmission lines are very long and potentially cross a variety of habitat types, greatly increasing the potential for adverse impacts to a number of rare terrestrial species. Therefore, the potential for adverse impacts to threatened or endangered species is considered high..

### **Additional Information Required:**

Distributions of woodpeckers, wood storks, indigo snakes, rattlesnake, pondberry, relict trillium, and any other threatened or endangered species in this part of Georgia. Detailed maps of transmission line routes and habitats along the lines. Transmission line maintenance procedures, and how these may affect species of concern.

### D.30 HOPE CREEK

**Priority Level:** High

**Level of Effort Required:** Moderate

#### **Background Information**

**FES Date:** February 1974

**Commercial Operation:** 1986

**Location:** East Shore of Delaware River Estuary, In Lower Alloways Creek Township, Salem County, NJ. About 7.5 Miles SE of Salem, NJ.

Total Licensed Thermal Power (MWt): 3293

Cooling System: Natural Draft Cooling Towers

Water Source: Delaware River

Intake/Discharge: Intake via structure at edge of river, discharge via pipe 3 m from shoreline.

Length of transmission lines (miles): 114

#### **Consultation History**

Potential impacts to shortnose sturgeon and sea turtles have been considered in relation to problems at the adjoining Salem site. Subsequently determined that the Hope Creek site did not jeopardize these organisms.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	27	Aquatic Score 2:	27
	Terrestrial Score 1:	12.5	Terrestrial Score 2:	13

**Quality of Biological Information Examined:** Moderate

#### **Threatened and Endangered Species Information**

Total # of potential Species:	22	Terrestrial:	15	Aquatic:	7
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Species most likely in vicinity of the power plant site or transmission lines:

The shortnose sturgeon and several sea turtle species are known to occur in the immediate vicinity of the plant. Terrestrial species known to be in the area include the bald eagle, bog turtle, swamp pink, bog asphodel, and Knieskern's beaked-rush. GEN&SIS identified several additional plant species that may occur near the transmission lines.

#### **Conclusions:**

Potential impacts to aquatic species of concern have been addressed several times in relation to the known takes at Salem. There have been no known takes at Hope Creek. The transmission lines are likely to cross habitat for 5 to 7 terrestrial species of concern, therefore the potential for adverse impacts to these species is considered high.

#### **Additional Information Required:**

Detailed routes of the transmission lines, habitats encountered along the lines, and known/potential distributions of the terrestrial species of concern.

### **D.31 INDIAN POINT**

**Priority Level:** Low

**Level of Effort Required:** None

#### **Background Information**

**FES Date:** Unit 2 - September 1972, Unit 3 - February 1975

**Commercial Operation:** Unit 2 - 1974, Unit 3 - 1976

**Location:** East Bank of Hudson River, at Buchanan, Westchester County, 24 miles N of New York, NY.

Total Licensed Thermal Power (MWt): 5783

Cooling System: Once Through

Water Source: Hudson River

Intake/Discharge: Intake and discharge at river edge.

Length of transmission lines (miles): 1

#### **Consultation History**

No records of previous interactions with USFWS were identified.

#### **Ranking Results**

Aquatic Score 1: 29      Aquatic Score 2: 19

Terrestrial Score 1: 75      Terrestrial Score 2: 75

**Quality of Biological Information Examined:** Moderate

#### **Threatened and Endangered Species Information**

Total # of potential Species: 15      Terrestrial: 13      Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

The only threatened or endangered species likely to be in the vicinity is the shortnose sturgeon.

#### **Conclusions:**

The transmission lines are extremely short, therefore impacts to terrestrial species is considered highly unlikely. The shortnose sturgeon could be affected by facility operations, but there were no record of incidental takes found for the 20 years of facility operations. Therefore, the potential for adverse impacts to threatened or endangered species is considered low.

#### **Additional Information Required:**

None.

## **D.32 KEWAUNEE**

**Priority Level:** Low

**Level of Effort Required:** Moderate

### **Background Information**

**FES Date:** December 1972

**Commercial Operation:** 1974

**Location:** Carlton Township, Kewaunee County, WI, approximately 27 miles ESE of Green Bay, WI. Total acreage of the site is about 908 acres.

Total Licensed Thermal Power (MWt): 1650

Cooling System: Once Through

Water Source: Lake Michigan

Intake/Discharge: Intake from submerged crib, 533 m from shore, discharge at shoreline.

Length of transmission lines (miles): 60

### **Consultation History**

No records of previous interactions with USFWS were identified.

### **Ranking Results**

Aquatic Score 1: 70.5    Aquatic Score 2: 70.5

Terrestrial Score 1: 39    Terrestrial Score 2: 45

**Quality of Biological Information Examined:** High

### **Threatened and Endangered Species Information**

Total # of potential Species: 10    Terrestrial: 10    Aquatic: 0

Species most likely in vicinity of the power plant site or transmission lines:

There are no known threatened or endangered aquatic species in the vicinity of the plant, and there are no known threatened or endangered terrestrial species in Kewaunee county. Species that potentially could be encountered along the transmission line that goes to Appleton include the bald eagle, Karner blue butterfly, and dwarf lake iris, and also Pitcher's thistle along the line that runs to Point Beach.

### **Conclusions:**

Adverse impacts to aquatic species of concern are considered highly unlikely. Bald eagles are probably not significantly impacted by the power plant or transmission lines. Adverse impacts to dwarf lake iris, Karner blue butterfly, and Pitcher's thistle are possible, but the potential is considered low.

### **Additional Information Required:**

Detailed routes of transmission lines, and distribution of dwarf lake iris, Karner blue butterfly, and Pitcher's thistle in relationship to these lines.

**D.33 LA CROSSE**

**Priority Level:** Low

**Level of Effort Required:** None

**Background Information**

**FES Date:** June 1976

**Commercial Operation:**

**Location:** East shore of the Mississippi River in the Village of Genoa, Vernon County, WI. U.S. lock and Dam No. 8 is about 3300 feet upstream from the site.

Total Licensed Thermal Power (MWt):

Cooling System:

Water Source:

Intake/Discharge:

Length of transmission lines (miles): 1

**Consultation History**

In 1980 the USFWS indicated that bald eagles and Higgin's eye pearlymussels were in the vicinity of the plant, but adverse impacts were unlikely.

**Ranking Results**

Aquatic Score 1: 39      Aquatic Score 2: 42

Terrestrial Score 1: 64      Terrestrial Score 2: 73

**Quality of Biological Information Examined:** Low

**Threatened and Endangered Species Information**

Total # of potential Species: 10      Terrestrial: 9      Aquatic: 1

Species most likely in vicinity of the power plant site or transmission lines:

Higgin's eye pearly mussel, bald eagles, peregrine falcons, and northern wild monkshood are all known to occur in the vicinity of the plant.

**Conclusions:**

The facility is presently inactive (SAFESTORE) therefore adverse impacts to the Higgin's eye pearlymussel are highly unlikely. The transmission lines are extremely short, therefore no adverse impacts to terrestrial species are likely.

**Additional Information Required:**

None

**D.34 LA SALLE**

**Priority Level: Moderate - High      Level of Effort Required: Moderate to High**

**Background Information**

**FES Date:** February 1973 / November 1978

**Commercial Operation:** 1984 (Units 1 & 2)

**Location:** 4 miles south of the Illinois River in Brookfield Township in the southeast corner of LaSalle County, Illinois. About 70 miles SW of downtown Chicago and about 24 miles WSW of Dresden Nuclear Power Station.

Total Licensed Thermal Power (MWt): 6646

Cooling System: Closed Cycle Cooling Pond

Water Source: Illinois River

Intake/Discharge: Intake and discharge from 832 ha pond, make-up from Illinois River

Length of transmission lines (miles): 103

**Consultation History**

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	51	Aquatic Score 2:	49
	Terrestrial Score 1:	14	Terrestrial Score 2:	17

**Quality of Biological Information Examined: Low**

**Threatened and Endangered Species Information**

Total # of potential Species: 20      Terrestrial: 13      Aquatic: 7

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are known from the vicinity of the plant. Terrestrial species known from the area include leafy prairie clover, decurrent false aster, bald eagle and Indiana bat. Critical Habitat for the Indiana bat is located at the Blackball mine in La Salle County. The GEN&SIS runs identified several additional remnant prairie species in the area.

**Conclusions:**

Adverse impacts to aquatic species of concern is considered highly unlikely. Bald eagles winter in the area, but are probably not significantly affected by the power plant or transmission lines. Facility and transmission line operations probably do not affect the Indiana bat critical habitat, but the species may be affected by transmission line maintenance activities, as would the decurrent false aster, leafy prairie clover, and other remnant prairie species. Therefore, the potential for adverse impacts to threatened or endangered species is considered moderate to high.

**Additional Information Required:**

Detailed routes of the transmission lines, habitats along these lines, and distribution of remnant prairie species.

### **D.35 LIMERICK**

**Priority Level:** Moderate - Low

**Level of Effort Required:** Moderate

#### **Background Information**

**FES Date:** November 1973

**Commercial Operation:** Unit 1 - 1986, Unit 2 - 1990

**Location:** East bank of Schuylkill River, Limerick Township, Montgomery County, 4 river miles down river from Pottstown, PA. 35 River miles upstream from Philadelphia. Site is partially in Chester County.

Total Licensed Thermal Power (MWt): 6586

Cooling System: Natural Draft Cooling Towers

Water Source: Schuylkill River

Intake/Discharge: Intake and discharge to river

Length of transmission lines (miles): 33

#### **Consultation History**

USFWS determined in 1982 that only species potentially affected was shortnose sturgeon. Further analysis concluded that operation of the facility would not adversely affect this species.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	34	Aquatic Score 2:	34
	Terrestrial Score 1:	52.5	Terrestrial Score 2:	53

**Quality of Biological Information Examined:** High

#### **Threatened and Endangered Species Information**

Total # of potential Species: 16    Terrestrial: 14    Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

The shortnose sturgeon is known from the vicinity, no other rare aquatic species are likely. Terrestrial species likely to be near the site are the bog turtle and the peregrine falcon, which is known to nest on several bridge spans near Philadelphia. Bald eagles occur as occasional transients in the area.

#### **Conclusions:**

Adverse affects on the shortnose sturgeon are possible, but direct take is unlikely because of the closed cycle cooling system. Eagles and falcons are probably not significantly affected by the power plant or transmission lines. The bog turtle could be affected by transmission line maintenance if appropriate habitats are crossed by the transmission lines. The potential for adverse impacts to threatened or endangered species is considered moderate to low.

#### **Additional Information Required:**

Detailed routes of transmission lines, habitats encountered, and distribution of bog turtles in relation to the lines.



**D.36 MAINE YANKEE**

**Priority Level:** Moderate - High      **Level of Effort Required:** Moderate to High

**Background Information**

**FES Date:** July 1972

**Commercial Operation:** 1972

**Location:** 4 miles S of Wiscasset, Lincoln County, Maine

Total Licensed Thermal Power (MWt): 2700

Cooling System: Once Through

Water Source: Back River

Intake/Discharge: Intake at bank of river, discharge to Montsweag Bay of Back River

Length of transmission lines (miles): 8

**Consultation History**

No records of interactions with USFWS or NMFS were located, but several shortnose sturgeon impingements were reported between 1980 and 1994. It is assumed that NMFS was made aware of these impingements.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	35	Aquatic Score 2:	33
	Terrestrial Score 1:	71	Terrestrial Score 2:	67

**Quality of Biological Information Examined:** Low

**Threatened and Endangered Species Information**

Total # of potential Species: 7      Terrestrial: 5      Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

Shortnose sturgeon and protected runs of Atlantic salmon are known from the vicinity of the site. Bald eagles are known to nest within 10 miles of the site - and Maine State designated essential habitat for eagles occurs within 10 miles of the site. Other species potentially in the area include the small-whorled pogonia and the peregrine falcon.

**Conclusions:**

Because of the short transmission lines potential impacts to terrestrial species are probably minimal. There have been known takes of shortnose sturgeon. A small run of Atlantic salmon spawns in the Sheepscot River, but it is unclear if Atlantic salmon use the adjoining Back river. This species was proposed for listing in 1995, therefore the potential effects of the Maine Yankee facilities on this species has probably not been fully evaluated.

**Additional Information Required:**

Surveys or examination of existing data on population levels of Atlantic salmon in the Back River near the site. Impingement / entrainment data for salmon and shortnose sturgeon.

**D.37 MCGUIRE**

**Priority Level:** Low

**Level of Effort Required:** Moderate to Low

**Background Information**

**FES Date:** April 1976

**Commercial Operation:** Unit 1 - 1981, Unit 2 - 1984

**Location:** Mecklinburg County, Near Charlotte, N.C.

Total Licensed Thermal Power (MWt): 6822

Cooling System: Once Through

Water Source: Lake Norman Reservoir

Intake/Discharge: Intake from submerged and surface at shoreline, discharge via 610 m canal

Length of transmission lines (miles): ca. 5

**Consultation History**

No records of previous interactions with USFWS were identified.

**Ranking Results**

Aquatic Score 1: 42      Aquatic Score 2: 38

Terrestrial Score 1: 65      Terrestrial Score 2: 66

**Quality of Biological Information Examined:** Low

**Threatened and Endangered Species Information**

Total # of potential Species: 27      Terrestrial: 24      Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

The Carolina heelsplitter is known from the area, but probably does not inhabit Lake Norman. Schweinitz's sunflower and the dwarf-flowered heartleaf are known from the vicinity of the power plant, and Michaux's sumac may be in the area.

**Conclusions:**

Adverse impacts to aquatic species of concern are considered highly unlikely. Several rare plant species are potentially in the vicinity, but since the transmission lines are short, the potential for adverse impacts to these species is considered low.

**Additional Information Required:**

Distribution of Schweinitz's sunflower, dwarf-flowered heartleaf and Michaux's sumac in the vicinity of the power plant site.

### D.38 MILLSTONE

Priority Level: Moderate - Low

Level of Effort Required: Low

#### Background Information

**FES Date:** Units 1&2 - June 1973, Unit 3 - February 1974

**Commercial Operation:** Unit 1 - 1971, unit 2 - 1975, Unit 3 - 1986

**Location:** Waterford, CT, in New London County. North Shore of Long Island Sound, east shore of Niantic Bay, 3.2 miles WSW of New London and 40 Miles SE of Hartford, CT.

Total Licensed Thermal Power (MWt): 8122

Cooling System: Once Through

Water Source: Long Island Sound

Intake/Discharge: Intake from Niantic Bay, Discharge to bay via holding pond.

Length of transmission lines (miles): 84

#### Consultation History

The USFWS indicated in 1983 that the small-whorled pogonia may be in the vicinity, but that no recent observations had been confirmed. Apparently there was an informal consultation concerning an underground storage tank on site, but records of this have not been retrieved.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	4	Aquatic Score 2:	3
	Terrestrial Score 1:	45	Terrestrial Score 2:	38

**Quality of Biological Information Examined:** Moderate to High

#### Threatened and Endangered Species Information

Total # of potential Species: 18      Terrestrial: 12      Aquatic: 6

Species most likely in vicinity of the power plant site or transmission lines:

Aquatic species in the vicinity include the shortnose sturgeon in the Connecticut River, and Green. Kemp's ridley, loggerhead, and leatherback sea turtles in Long Island Sound. Terrestrial species include the small-whorled pogonia, piping plovers, and bald eagles along the Connecticut River.

#### Conclusions:

There are potential interactions with shortnose sturgeon and bald eagles where transmission lines cross the Connecticut River, and the small-whorled pogonia, if present, could be affected by transmission line maintenance. The actual presence of this species near the power plant or transmission lines is doubtful. Piping plovers (at Old Lyme) do not occur near the transmission lines, and should not be directly affected by the facilities. Sea turtles are in the vicinity of the power plant and are subject to impingement, the potential is increased by the large size and water usage at this site. However, there have been no documented sea turtle impingements during the 20 to 25 years of facility operation. Therefore, there is a potential for adverse impacts to threatened or endangered species, especially sea turtles, but the probability is considered moderate to low.

#### Additional Information Required:

Confirm that no sea turtles have been taken on intake screens.

### D.39 MONTICELLO

**Priority Level:** Low

**Level of Effort Required:** Moderate

#### **Background Information**

**FES Date:** November 1972

**Commercial Operation:** 1971

**Location:** 35 miles northwest of St. Paul-Minneapolis on the southwest bank of the Mississippi River; 3 miles northwest of the town of Monticello, in Wright County, Minnesota.

Total Licensed Thermal Power (MWt): 1670

Cooling System: Once Through with helper towers

Water Source: Mississippi River

Intake/Discharge: Intake and discharge to river via canals

Length of transmission lines (miles): 60

#### **Consultation History**

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	61	Aquatic Score 2:	61.5
	Terrestrial Score 1:	49.5	Terrestrial Score 2:	49

**Quality of Biological Information Examined:** Moderate

#### **Threatened and Endangered Species Information**

Total # of potential Species: 9      Terrestrial: 7      Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

There are no threatened or endangered aquatic species known from the site vicinity. The bald eagle is known to nest within 2 miles of the power plant site, and peregrine falcons may also breed in the area. Several remnant prairie species potentially occur in the general vicinity of the power plant and transmission lines.

#### **Conclusions:**

Adverse impacts to aquatic threatened or endangered species is considered highly unlikely. The eagles and falcons are probably not directly impacted by site operations, the primary effects may be associated with altering ice cover during winter months, which could affect bald eagle feeding areas. The USFWS did not indicate that the remnant prairie species were in the area or that they could be affected, these were identified by GEn&SIS. Therefore, there are potential ESA issues associated with this site, but the potential for adverse impacts to threatened or endangered species is considered low.

#### **Additional Information Required:**

Locations of bald eagle nesting, roosting, and feeding areas, known distributions of remnant prairie species in relation to transmission lines.

#### **D.40 NINE MILE POINT**

**Priority Level:** Low

**Level of Effort Required:** Moderate

##### **Background Information**

**FES Date:** Unit 1 - January 1974, Unit 2 - June 1973

**Commercial Operation:** Unit 1 - 1969, Unit 2 - 1988

**Location:** South Shore of Lake Ontario, at Nine-Mile Point, near Scriba, NY, Oswego County.  
8 Miles east of Oswego, 36 miles NE of Syracuse

Total Licensed Thermal Power (MWt): 5173

Cooling System: Unit 1 - Once Through, Unit 2 - Natural Draft Cooling Tower

Water Source: Lake Ontario

Intake/Discharge: Intake via submerged pipes 300 m offshore, discharge via 169 m diffuser pipes

Length of transmission lines (miles): 36

##### **Consultation History**

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	70.5	Aquatic Score 2:	70.5
	Terrestrial Score 1:	61	Terrestrial Score 2:	60

**Quality of Biological Information Examined:** Low

##### **Threatened and Endangered Species Information**

Total # of potential Species: 8      Terrestrial: 8      Aquatic: 0

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are known from the vicinity. The only terrestrial species likely to be in the area and be affected by the power plant or transmission lines is the bog turtle. Bald eagles may migrate through the area. GEN&SIS indicated the potential presence of piping plovers, Indiana bats, and 3 plant species - Leedy's roseroot, small-whorled pogonia, and American hart's-tongue fern.

##### **Conclusions:**

Adverse impacts to rare aquatic species is considered highly unlikely. Bog turtles and perhaps the plant species may be affected in areas where the transmission lines cross suitable habitat. The bald eagle apparently only migrates through the area, and is unlikely to be affected by facility operations. Therefore, the potential for adverse impacts to threatened or endangered species is considered low.

##### **Additional Information Required:**

Transmission line routes, habitats encountered along lines, bog turtle distribution, and known distributions and habitat needs of the plant species potentially occurring in the area.

#### **D.41 NORTH ANNA**

**Priority Level:** Moderate - High

**Level of Effort Required:** Moderate

##### **Background Information**

**FES Date:** April 1973

**Commercial Operation:** Unit 1 - 1978, Unit 2 - 1980

**Location:** South Bank of North Anna River, Louisa County, VA. 40 miles east of Charlottesville, and 30 miles northwest of Richmond, VA.

Total Licensed Thermal Power (MWt): 5786

Cooling System: Once Through

Water Source: Lake Anna reservoir

Intake/Discharge: Intake at lake shore, discharge to lake via 1400 ha holding pond

Length of transmission lines (miles): 132

##### **Consultation History**

No records of previous interactions with USFWS were identified.

**Ranking Results**    Aquatic Score 1:        19        Aquatic Score 2:        14

Terrestrial Score 1:    19        Terrestrial Score 2:    18

**Quality of Biological Information Examined:** Moderate to High

##### **Threatened and Endangered Species Information**

Total # of potential Species:    21        Terrestrial:        17        Aquatic:        4

Species most likely in vicinity of the power plant site or transmission lines:

The presence of rare aquatic species in Lake Anna is unlikely, but the James River spiny mussel and dwarf wedge mussel are known to occur in the vicinity of the power plant. Terrestrial species known from the area include the bald eagle, swamp pink, and small-whorled pogonia.

##### **Conclusions:**

Adverse impacts to threatened or endangered aquatic species are considered unlikely. But the two mussels could be affected at points where transmission lines cross rivers or streams. There is a potential for transmission line maintenance to adversely affect the small-whorled pogonia that occurs in upland forests and the swamp pink which is an obligate wetland plant. Bald eagles are probably not significantly affected by the power plant or transmission lines. Therefore, the potential for adverse impacts to threatened or endangered species is considered moderate to high.

##### **Additional Information Required:**

Detailed maps of the transmission lines, habitats encountered along the lines, especially wetlands, and known distributions of James River spiny mussel, dwarf wedge mussel, small-whorled pogonia, and swamp pink.

## D.42 OCONEE

**Priority Level:** High

**Level of Effort Required:** Moderate

### Background Information

**FES Date:** March 1972

**Commercial Operation:** Unit 1 - 1973, Units 2 & 3 - 1974

**Location:** Oconee County, SC, near the NC-SC border, about 1 mile from Pickens County. 8 miles NE of Seneca and 25 miles W of Greenville, SC. The Site includes Lake Keowee, Lake Jocassee and the headwaters of Hartwell Reservoir.

Total Licensed Thermal Power (MWt): 7704

Cooling System: Once Through

Water Source: Lake Keowee

Intake/Discharge: Intake via canal behind skimmer wall, discharge via concrete structure on shore.

Length of transmission lines (miles): 330

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	45.5	Aquatic Score 2:	43
	Terrestrial Score 1:	6	Terrestrial Score 2:	5

**Quality of Biological Information Examined:** Moderate to High

### Threatened and Endangered Species Information

Total # of potential Species:	34	Terrestrial:	29	Aquatic:	5
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Species most likely in vicinity of the power plant site or transmission lines:

Several rare mussels and fishes potentially exist in the general vicinity, but they are unlikely to inhabit Keowee reservoir. Bald eagles are known from the surrounding counties and the Indiana bat is known from Oconee county. Rare plant species known to be in Oconee county, include smooth coneflower, small-whorled pogonia, mountain sweet pitcher-plant, and persistent trillium. GEN&SIS identified an additional 12 plant species in the vicinity of the site or transmission lines.

### Conclusions:

Adverse impacts to rare aquatic species are expected to be unlikely. There are many threatened or endangered plant species that may be in the vicinity of the facility or transmission lines. The transmission lines are very long, but the FES provided very little information about where these lines are routed. It did state that within Oconee and Pickens counties, about 73% of the land is considered woodland. Therefore, since the transmission lines are long, the routing of these lines is unclear, and a relatively large number of species are potentially affected by maintenance of these lines, the potential for adverse impacts to threatened or endangered species is considered high.

### Additional Information Required:

Detailed map of transmission lines, habitats encountered, and distribution of rare plant species.



#### D.43 OYSTER CREEK

**Priority Level:** Moderate - Low

**Level of Effort Required:** Moderate

##### Background Information

**FES Date:** December 1974

**Commercial Operation:** 1969

**Location:** Ocean County, NJ, 2 miles inland from Barnegat Bay, Mainly in Lacey Township 60 miles south of Newark, 35 miles N of Atlantic City.

Total Licensed Thermal Power (MWt): 1930

Cooling System: Once Through

Water Source: Barnegat Bay

Intake/Discharge: the Forked river serves as the intake and discharge canals

Length of transmission lines (miles): 11

##### Consultation History

The USFWS indicated in 1984 that only occasional transient species would be in the area. Another species list was provided to the NRC or the Licensee in 1992, but this list was not located. NMFS stated that sea turtles had been taken, and a biological opinion was prepared in 1995 that included an incidental take statement. Records of sea turtle takes and the biological opinion were not found.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	37	Aquatic Score 2:	37
	Terrestrial Score 1:	27	Terrestrial Score 2:	61

**Quality of Biological Information Examined:** Moderate

##### Threatened and Endangered Species Information

Total # of potential Species: 17    Terrestrial: 13    Aquatic: 4

Species most likely in vicinity of the power plant site or transmission lines:

Kemp's ridley, green and loggerhead sea turtles are known in the area and have been taken. Terrestrial species known from the area include piping plover, peregrine falcon, bog turtle, swamp pink, Knieskern's beaked-rush, and bog asphodel.

##### Conclusions:

Sea turtles have been taken at this site, but these species can be considered managed because there was a formal consultation with NMFS that resulted in a Biological Opinion and an incidental take statement. The terrestrial species are potentially affected by transmission line maintenance, but the transmission lines are relatively short, which reduces the potential for adverse impacts. Therefore, there are ESA issues associated with this site, but the potential for adverse impacts to species not already covered by existing consultations is considered moderate to low.

##### Additional Information Required:

Documentation of the NMFS biological opinion and incidental take statement, habitats along the transmission lines, and distribution of terrestrial species in relation to the lines.

#### **D.44 PALISADES**

**Priority Level: Moderate - Low**

**Level of Effort Required: Moderate**

##### **Background Information**

**FES Date:** June 1972

**Commercial Operation:** 1973

**Location:** Eastern shore of Lake Michigan. 35 miles north of the Michigan-Indiana border in Covert Township, Van Buren County, Michigan. About 5 miles north South Haven.

Total Licensed Thermal Power (MWt): 2530

Cooling System: Mechanical Draft Cooling Towers

Water Source: Lake Michigan

Intake/Discharge: Intake crib 1000 m from shore, discharge via 33 m canal

Length of transmission lines (miles): 41

##### **Consultation History**

No records of previous interactions with USFWS were identified.

##### **Ranking Results**

Aquatic Score 1: 65      Aquatic Score 2: 65

Terrestrial Score 1: 54      Terrestrial Score 2: 50

**Quality of Biological Information Examined: Moderate**

##### **Threatened and Endangered Species Information**

Total # of potential Species: 13      Terrestrial: 11      Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

There are no threatened or endangered aquatic species that are likely to be in the vicinity. The most likely terrestrial species in the area are the bald eagle, and pitcher's thistle, and possibly the American burying beetle. GEN&SIS identified Mitchell's satyr and Karner Blue butterflies, northern copperbelly water snake, and small-whorled pogonia as potentially occurring in the area.

##### **Conclusions:**

Adverse impacts to threatened or endangered aquatic species are considered to be highly unlikely. Several terrestrial species are potentially affected by transmission line maintenance, but the transmission lines are relatively short. Therefore the potential for adverse impacts to threatened or endangered species is considered moderate to low.

##### **Additional Information Required:**

Detailed routes of transmission lines, habitats along the routes, and the distributions of the rare terrestrial species.

#### **D.45 PALO VERDE**

**Priority Level:** High

**Level of Effort Required:** Moderate to High

##### **Background Information**

**FES Date:** September 1975, Supplement February 1976

**Commercial Operation:** Units 1 & 2 - 1986, Unit 3 - 1988

**Location:** Maricopa County, AZ, 15 miles west of Buckey, 50 miles west of Phoenix.

Total Licensed Thermal Power (MWt): 11400

Cooling System: Mechanical Draft Cooling Towers

Water Source: Phoenix City Sewer System

Intake/Discharge: Intake via 56-km pipeline from Phoenix, discharge to on-site evaporation pond

Length of transmission lines (miles): 585

##### **Consultation History**

No records of previous interactions with USFWS were identified.

**Ranking Results**    Aquatic Score 1:        17        Aquatic Score 2:        25

                         Terrestrial Score 1:    3        Terrestrial Score 2:    1

**Quality of Biological Information Examined:** Moderate

##### **Threatened and Endangered Species Information**

Total # of potential Species:    26        Terrestrial:        19        Aquatic:        7

Species most likely in vicinity of the power plant site or transmission lines:

No aquatic species are likely to be affected because of the unique water system. However, aquatic species that may be affected at transmission line river crossings include desert pupfish, Gila topminnow, and razorback sucker. Terrestrial species likely to be found along transmission corridors include Sonoran pronghorn, lesser bat, southwestern willow flycatcher, Cactus ferruginous pygmy owl, bald eagles, peregrine falcons, and Mexican spotted owls. Plant species potentially occurring in the transmission line corridors include the Arizona agave, Arizona hedgehog cactus, and Arizona cliffrose. Critical habitats for the Mexican spotted owl, southwestern willow flycatcher, cactus ferruginous pygmy owl, razorback sucker and desert pupfish occur near the power plant site or transmission lines.

##### **Conclusions:**

A large number of species are potentially affected by transmission line operation and maintenance, and the transmission lines are very long. Therefore, the potential for adverse impacts to threatened or endangered species is considered high.

##### **Additional Information Required:**

Transmission line routes, habitats along the routes, distribution of each of the rare species, and the designated locations of the 5 critical habitats.

#### D.46 PEACH BOTTOM

Priority Level: Low

Level of Effort Required: Moderate

##### Background Information

FES Date: April 1973

Commercial Operation: Units 2&3 - 1974

Location: West Shore of Susquehanna River, 18 miles above Chesapeake Bay. Peach Bottom Township, York County, PA.

Total Licensed Thermal Power (MWt): 6586

Cooling System: Once through with helper towers

Water Source: Conowingo pond (reservoir)

Intake/Discharge: Intake via small intake pond, discharge via 1520 m canal

Length of transmission lines (miles): 30

##### Consultation History

No records of previous interactions with USFWS were identified.

##### Ranking Results

Aquatic Score 1: 49.5    Aquatic Score 2: 50

Terrestrial Score 1: 46    Terrestrial Score 2: 55

Quality of Biological Information Examined: High

##### Threatened and Endangered Species Information

Total # of potential Species: 16    Terrestrial: 13    Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

There is a small potential for shortnose sturgeon and Maryland darters near the power plant, but since the Susquehanna river is dammed below the power plant site, these species are unlikely. Terrestrial species potentially in the area include the bald eagle, bog turtle, and possibly the Delmarva peninsula fox squirrel, swamp pink, and puritan tiger beetle.

##### Conclusions:

Adverse impacts to threatened or endangered aquatic species are considered unlikely. The USFWS only listed the bald eagle and bog turtle as likely to be in the area, along with several former candidate 2 species. The other species were identified via the GEN&SIS runs. The transmission lines are relatively short, therefore the potential for adverse impacts to threatened or endangered species is considered low.

##### Additional Information Required:

Transmission line route, habitats along the line, distributions and habitat requirements of species along the lines.

**D.47 PERRY**

**Priority Level:** Moderate - High

**Level of Effort Required:** Moderate

**Background Information**

**FES Date:** April 1974

**Commercial Operation:** 1987

**Location:** Northeastern Lake County, Ohio, about 35 miles northeast of Cleveland. The 1,100-acre site, fronts on Lake Erie.

Total Licensed Thermal Power (MWt): 3579

Cooling System: Natural Draft Cooling Towers

Water Source: Lake Erie

Intake/Discharge: Intake via submerged multi-port structure 777 m offshore, discharge via submerged diffuse 503 m offshore

Length of transmission lines (miles): 93

**Consultation History**

No records of consultations with the USFWS were found, but the Ohio DNR indicated in 1981 that Indiana bats were found in the adjacent township, that suitable habitat existed at the site, and that their presence should be assumed.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	61	Aquatic Score 2:	63
	Terrestrial Score 1:	16	Terrestrial Score 2:	19

**Quality of Biological Information Examined:** Moderate to High

**Threatened and Endangered Species Information**

Total # of potential Species: 11    Terrestrial: 8    Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are likely to be near the power plant site. Indiana bats are known from the near vicinity, and other likely terrestrial species include bald eagles, piping plovers, peregrine falcons, northern wild monkshood, and Mitchell's satyr butterfly.

**Conclusions:**

Adverse impacts to threatened or endangered aquatic species are considered highly unlikely. Several species may be affected by transmission line operation and maintenance, and the transmission lines are moderately long. The Indiana bat is known to be in the area and would be subject to impacts from facility operations or transmission line maintenance. Therefore, the potential for adverse impacts on threatened or endangered species is considered moderate to high.

**Additional Information Required:**

Maps of potential Indiana bat habitat near the power plant and transmission lines, other habitats along the lines, and the distribution of other rare species in the area.

#### D.48 PILGRIM

**Priority Level:** Moderate - High

**Level of Effort Required:** Moderate

##### Background Information

**FES Date:** Unit 1 - May 1972

**Commercial Operation:** 1972

**Location:** Western Shore of Cape Cod Bay at Rocky Point, Plymouth County, MA.

Total Licensed Thermal Power (MWt): 1998

Cooling System: Once Through

Water Source: Cape Cod Bay

Intake/Discharge: Intake from Bay protected by breakwater, discharge via 260 m canal.

Length of transmission lines (miles): 34 miles

##### Consultation History

No records of previous interactions with USFWS were found, but the USFWS indicated that an informal consultation concerning maintenance dredging occurred in 1994..

<b><u>Ranking Results</u></b>	Aquatic Score 1:	7	Aquatic Score 2:	12
	Terrestrial Score 1:	51	Terrestrial Score 2:	52

**Quality of Biological Information Examined:** Low

##### Threatened and Endangered Species Information

Total # of potential Species: 20      Terrestrial: 12      Aquatic: 8

Species most likely in vicinity of the power plant site or transmission lines:

Aquatic species in the area include the right and humpback whales, and Kemp's ridley, green, loggerhead, and leatherback sea turtles. Cape Cod Bay is designated critical habitat for the Right whale. Terrestrial species in the vicinity include piping plover and the Plymouth red-belly turtle.

##### Conclusions:

The sea turtles are potentially affected by facility operations. Whales in Cape Cod Bay could be affected by alterations to the food base. Piping plovers primarily occur on the shoreline so they could be affected by facility operations but are not likely to be affected by transmission lines. The Plymouth red-belly turtle occurs in coastal plain ponds throughout Plymouth county, and could therefore be impacted by transmission line maintenance if the line is near appropriate habitat. Therefore, there are potential ESA issues associated with this site, and the potential for adverse impacts on threatened or endangered species is considered moderate to high.

##### Additional Information Required:

Location of transmission lines in relation to suitable red-belly turtle habitat, Records of sea turtle occurrences near the intake or discharge points.

#### **D.49 POINT BEACH**

**Priority Level:** Low

**Level of Effort Required:** Moderate

##### **Background Information**

**FES Date:** May 1972

**Commercial Operation:** Unit 1 - 1970, Unit 2 - 1972

**Location:** West shore of Lake Michigan, in Manitowoc County, WI, 30 miles SE of Green Bay.

Total Licensed Thermal Power (MWt): 3038

Cooling System: Once Through

Water Source: Lake Michigan

Intake/Discharge: Intake via structure 7 m deep, 533 m from shore, discharge via flumes 46 m off shore

Length of transmission lines (miles): 210

##### **Consultation History**

No records of previous interactions with USFWS were identified.

##### **Ranking Results**

Aquatic Score 1: 70.5    Aquatic Score 2: 70.5

Terrestrial Score 1: 25    Terrestrial Score 2: 10

**Quality of Biological Information Examined:** Low

##### **Threatened and Endangered Species Information**

Total # of potential Species: 10    Terrestrial: 10    Aquatic: 0

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are known from the vicinity. Terrestrial species known to be in the area are Pitcher's thistle, and the bald Eagle. The eastern prairie fringed orchid may occur along the transmission lines that run toward Milwaukee to the south.

##### **Conclusions:**

Adverse impacts to threatened or endangered aquatic species are considered highly unlikely. Pitcher's thistle is known from Manitowoc county, but not from the immediate vicinity of the power plant site or transmission lines. The eastern prairie fringed orchid could be affected by transmission line maintenance. Therefore, there are potential ESA issues associated with this site, but the potential for adverse impacts to threatened or endangered species is considered low.

##### **Additional Information Required:**

Locations of potential eastern prairie fringed orchid habitat in relation to the transmission lines.



## **D.50 PRAIRIE ISLAND**

**Priority Level:** Moderate - Low

**Level of Effort Required:** Moderate to High

### **Background Information**

**FES Date:** May 1972

**Commercial Operation:** Unit 1 - 1973, Unit 2 - 1974

**Location:** Approximately 35 miles SE of Minneapolis-St. Paul on the Mississippi River (RM 798.4), Burnside Township, Goodhue County, Minnesota.

Total Licensed Thermal Power (MWt): 3300

Cooling System: Once Through with Mechanical Draft Cooling Towers

Water Source: Mississippi River

Intake/Discharge: Intake via short canal, discharge to basin, then to towers and/or river

Length of transmission lines (miles): 78

### **Consultation History**

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	31.5	Aquatic Score 2:	30.5
	Terrestrial Score 1:	42	Terrestrial Score 2:	37

**Quality of Biological Information Examined:** Moderate

### **Threatened and Endangered Species Information**

Total # of potential Species: 9      Terrestrial: 7      Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

The Higgin's eye pearly mussel potentially occurs in the vicinity of the power plant. Terrestrial species known from the area include the bald eagle, which nests near the power plant site, and the peregrine falcon. GEN&SIS identified several remnant prairie species that could be in the vicinity of the transmission lines.

### **Conclusions:**

The USFWS indicated that the Higgin's eye pearly mussel has not been found in the immediate vicinity of the power plant. They also stated that changes in facility operation could modify the ice cover in winter and therefore affect bald eagle feeding areas. The presence of remnant prairie species in the vicinity of the power plant or transmission lines is questionable. Therefore, there are possible ESA issues associated with this site, but the potential for adverse impacts to threatened or endangered species is considered moderate to low.

### **Additional Information Required:**

Habitats along transmission lines, potential remnant prairie sites near the transmission lines.  
Survey data for Higgin's eye pearly mussel in the vicinity of the power plant.

## D.51 QUAD CITIES

**Priority Level:** Moderate - High

**Level of Effort Required:** Moderate to High

### Background Information

**FES Date:** September 1972

**Commercial Operation:** Units 1 & 2 - 1973

**Location:** On the Mississippi River (Mile 506.5) Rock Island County, IL 3 miles north of Cordova, IL, and about 20 miles northeast of the Quad-Cities-Bettendorf area.

Total Licensed Thermal Power (MWt): 5022

Cooling System: Once Through

Water Source: Mississippi River

Intake/Discharge: Intake from crib at river shore, discharge via 4300 m spray canal.

Length of transmission lines (miles): 125

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	19	Aquatic Score 2:	11
	Terrestrial Score 1:	47	Terrestrial Score 2:	36

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 12      Terrestrial: 9      Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

The Higgin's eye pearly mussel is known to occur near the power plant site, although there is no designated critical habitat this species, the recovery team has designated 2 reaches of the Mississippi river within Rock Island County as essential to the recovery of the species, one of these is from river mile 503 to 505.4L and is therefore within 1.1 mile of the Quad-Cities facilities. Terrestrial species in the vicinity include the bald eagle, and potentially prairie fringed orchid and prairie bush clover.

### Conclusions:

Terrestrial concerns are not major, although some remnant prairie species may be present along transmission lines. Important areas for the recovery of the Higgin's eye pearly mussel are near the power plant site. Therefore, the potential for adverse impacts to threatened or endangered species is considered moderate to high.

### Additional Information Required:

Survey data for Higgin's eye pearly mussel near the power plant site, distribution of potential remnant prairie stands in the vicinity of the transmission lines.

## D.52 RANCHO SECO

Priority Level: Low

Level of Effort Required: None

### Background Information

FES Date: March 1973

Commercial Operation: 1975

Location: SE part of Sacramento County, CA, 26 miles NE of Stockton, 25 miles SE of Sacramento.

Total Licensed Thermal Power (MWt): 2772

Cooling System: Natural Draft Cooling Towers

Water Source: Folsom Canal

Intake/Discharge: 5.6 km pipeline from Folsom Canal, discharge via 2.4 km pipeline to reservoir

Length of transmission lines (miles): 44

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	10	Aquatic Score 2:	15
	Terrestrial Score 1:	15	Terrestrial Score 2:	22

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 17    Terrestrial: 12    Aquatic: 5

Species most likely in vicinity of the power plant site or transmission lines:

Several aquatic species are in the area (vernal pool tadpole and fairy shrimps, delta smelt, chinook salmon, Sacramento splittail) but these are unlikely to be affected by the power plant because of the water intake and discharge system. Terrestrial species potentially in the area include the California tiger salamander, Aleutian Canada goose, valley elderberry beetle, peregrine falcon, bald eagle, San Joaquin woodrat, California red-legged frog, riparian brush rabbit, giant garter snake, San Joaquin kit fox, and Sacramento orcutt grass.

### Conclusions:

The facility is under decommissioning, therefore adverse effects on aquatic species is highly unlikely. The transmission lines are moderately short, so the potential for affects on terrestrial species is relatively small. Further consideration of potential ESA issues may be performed as part of the decommissioning documentation.

### Additional Information Required:

None

### **D.53 RIVER BEND**

**Priority Level: High**

**Level of Effort Required: Low**

#### **Background Information**

**FES Date:** July 1984

**Commercial Operation:** 1986

**Location:** Mississippi river (mile 263) near St. Francisville, West Feliciana Parish, Louisiana

Total Licensed Thermal Power (MWt): 2894

Cooling System: Mechanical Draft Cooling Towers

Water Source: Mississippi River

Intake/Discharge: Intake at river bank, discharge via pipe extending into river.

Length of transmission lines (miles): > 30 (84?)

#### **Consultation History**

The USFWS indicated in 1983 that red-cockaded woodpeckers may be present at or near the site and suggested that evaluations be performed.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	40	Aquatic Score 2:	45
	Terrestrial Score 1:	58.5	Terrestrial Score 2:	58.5

**Quality of Biological Information Examined: Low**

#### **Threatened and Endangered Species Information**

Total # of potential Species: 12    Terrestrial: 8    Aquatic: 4

Species most likely in vicinity of the power plant site or transmission lines:

The pallid sturgeon is likely to be found near the facility. Terrestrial species known from the area include the Louisiana black bear, and potentially red-cockaded woodpeckers, bald eagles, and peregrine falcons. Forested wetlands near the power plant site have been proposed as critical habitat for the Louisiana black bear.

#### **Conclusions:**

Pallid sturgeons may be in the vicinity, but because the facility uses a closed cycle cooling system, the potential for impingements or other adverse impacts to this species is probably low. The primary concern for this site is the proposed critical habitat for Louisiana black bear in the vicinity of the power plant. It is possible that facility operations or transmission line operations and maintenance could have an impact on this species or its critical habitat. The FES did not provide details about the routes or overall length of the transmission system. If the proposed habitat is not near the transmission lines or would not be otherwise impacted by site operations then the overall potential for adverse impacts to threatened or endangered species is low.

#### **Additional Information Required:**

Location and distribution of proposed Louisiana black bear critical habitat, detailed maps of transmission line routes.

## **D.54 ROBINSON**

**Priority Level: Moderate - High**

**Level of Effort Required: Moderate**

### **Background Information**

**FES Date:** April 1975

**Commercial Operation:** 1971

**Location:** NW corner of Darlington County, South Carolina, five miles WNW of Hartsville. The power plant site encompasses 4,750 acres including the 2250-acre Lake Robinson.

Total Licensed Thermal Power (MWt): 2300

Cooling System: Once Through

Water Source: Lake Robinson

Intake/Discharge: Intake from edge of lake, discharge via 6.8 km canal to lake.

Length of transmission lines (miles): 84

### **Consultation History**

No records of previous interactions with USFWS were identified. But the licensee indicated to NRC in 1983 that the red-cockaded woodpecker is located on site, and that they would carefully evaluate activities within 2000 feet of nest trees.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	47	Aquatic Score 2:	48
	Terrestrial Score 1:	31	Terrestrial Score 2:	32

**Quality of Biological Information Examined: Moderate**

### **Threatened and Endangered Species Information**

Total # of potential Species: 20      Terrestrial: 17      Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are likely to be in the vicinity. Terrestrial species in the area include the red-cockaded woodpecker, bald eagles, peregrine falcon, and Rough leafed loosestrife. GEN&SIS identified a number of additional rare plant species in the vicinity of the power plant and transmission lines.

### **Conclusions:**

Adverse impacts to threatened or endangered aquatic species are considered highly unlikely. The red-cockaded woodpecker can probably be considered managed at this site. The primary concern is the potential for rare plant species to inhabit the transmission line rights of way. The transmission line length is moderately long, therefore the potential for adverse impacts to threatened or endangered species is considered moderate to high.

### **Additional Information Required:**

Detailed maps of transmission line routes, potential distribution of rare plant species and habitat. Also plans and procedures for managing impacts to red-cockaded woodpeckers.

**D.55 SALEM**

**Priority Level: High**

**Level of Effort Required: Moderate**

**Background Information**

**FES Date:** April 1973

**Commercial Operation:** Unit 1 - 1977, Unit 2 - 1981

**Location:** East Shore of Delaware River Estuary, Lower Alloways Creek Township, Salem County, NJ. 7.5 Miles SE of Salem, NJ.

Total Licensed Thermal Power (MWt): 6822

Cooling System: Once Through

Water Source: Delaware River

Intake/Discharge: Intake structure at river shore, discharge via submerged pipes 1250 m off shore

Length of transmission lines (miles): 106

**Consultation History**

Long history of interactions concerning sturgeons and sea turtles. Updated biological opinion from NMFS in 1993 included incidental take statement for shortnose sturgeon, and loggerhead, green, and Kemp's ridley sea turtles.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	13	Aquatic Score 2:	4
	Terrestrial Score 1:	12.5	Terrestrial Score 2:	15

**Quality of Biological Information Examined: Moderate**

**Threatened and Endangered Species Information**

Total # of potential Species: 22    Terrestrial: 15    Aquatic: 7

Species most likely in vicinity of the power plant site or transmission lines:

Shortnose sturgeon, and green, loggerhead, and Kemp's ridley sea turtles occur at the site and have been taken. Terrestrial species known to be in the area include the bald eagle, bog turtle, swamp pink, bog asphodel, and Knieskern's beaked-rush. GEN&SIS identified several additional rare plant species that may occur near the transmission lines.

**Conclusions:**

Potential impacts to aquatic species of concern have been addressed several times at this site, therefore all of the aquatic species of concern likely to be in the area are considered managed. The transmission lines are likely to cross habitat for 5 to 7 terrestrial species of concern, therefore the potential for adverse impacts to these species is considered high.

**Additional Information Required:**

Detailed routes of the transmission lines, habitats encountered along the lines, and known/potential distributions of the terrestrial species of concern and their habitats.

**D.56 SAN ONOFRE**

**Priority Level: High**

**Level of Effort Required: High**

**Background Information**

**FES Date:** Unit 1 - October 1973, Units 2&3 - March 1973

**Commercial Operation:** Unit 1 - 1968, Units 2 - 1983, Unit 3 - 1984

**Location:** Shore of Pacific Ocean, San Diego County, CA about 4 miles SW of San Clemente, Adjacent to Camp Pendleton.

Total Licensed Thermal Power (MWt): 9027

Cooling System: Once Through

Water Source: Pacific Ocean

Intake/Discharge: Unit 1 - intake 980 m from shore, discharge 790 m off shore; Units 2&3 - Intake 1040 m offshore 9 m deep, discharge via diffuser ports between 1160 and 2590 m offshore.

Length of transmission lines (miles): 103

**Consultation History**

No records of previous interactions with USFWS were identified. The EA / FONSI for the full-term operating license for Unit 1 full term licensee recommended consultation for green sea turtle. The USFWS indicated that they had provided a letter concerning the SONGS firing range in 1995.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	5	Aquatic Score 2:	5
	Terrestrial Score 1:	5	Terrestrial Score 2:	8

**Quality of Biological Information Examined: High**

**Threatened and Endangered Species Information**

Total # of potential Species: 88      Terrestrial: 71      Aquatic: 17

Species most likely in vicinity of the power plant site or transmission lines:

Aquatic species potentially in the vicinity include green and olive ridley sea turtles, harbor seals, California sealions, and southern sea otters. Terrestrial species potentially in the area include California gnatcatcher, least tern, least Bell's vireo, brown pelican, California red-legged frog, western snowy plover, light-footed clapper rail, pacific pocket mouse, and between 10 and 25 threatened or endangered plant species.

**Conclusions:**

Potential adverse impacts exist for several aquatic and many terrestrial species. The length of the transmission lines are moderately long, and habitat heterogeneity in the area is high. Therefore the potential for adverse impacts to threatened or endangered species is considered high.

**Additional Information Required:**

Detailed routes of transmission lines, distribution of rare terrestrial species and potential habitats for those species. Information about potential effects on near shore ecology and population levels of rare aquatic species in the area.



## D.57 SEABROOK

**Priority Level:** Low

**Level of Effort Required:** Moderate

### Background Information

**FES Date:** December 1974

**Commercial Operation:** ?

**Location:** Atlantic Coast, Rockingham county, at Seabrook, NH, 11 miles S of Portsmouth NH.

Total Licensed Thermal Power (MWt): 3411

Cooling System: Once Through

Water Source: Atlantic Ocean

Intake/Discharge: Intake via submerged structure 2.1 km off shore, discharge via submerged structure 1.7 km off shore.

Length of transmission lines (miles): 86

### Consultation History

Informal interactions with USFWS and NMFS in 1981, species identified were bald eagle, peregrine falcon, small-whorled pogonia, shortnose sturgeon, leatherback sea turtle, and the humpback, right, and fin whales. Concluded that no significant impacts would occur. Apparently NMFS also had an informal consultation with EPA in 1993 concerning this site.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	26	Aquatic Score 2:	24
	Terrestrial Score 1:	49.5	Terrestrial Score 2:	42

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 19      Terrestrial: 10      Aquatic: 9

Species most likely in vicinity of the power plant site or transmission lines:

The leatherback sea turtle and shortnose sturgeon (in Merrimack river) are in the vicinity of the power plant, as well as humpback and fin whales; other sea turtles may also be present. Terrestrial species include piping plover, bald eagle, peregrine falcon, and small-whorled pogonia.

### Conclusions:

The design of the intake structure, with a velocity cap, makes sea turtle and sturgeon impingements less likely than other intake arrangements. Eagles and falcons are mainly transient in the area, and the small-whorled pogonia is primarily known from historical records. Piping plovers are known to occur in Newburyport, MA, and were historically known from Seabrook. Therefore, potential ESA issues associated with this site are probably minor, and the potential for adverse impacts to threatened or endangered species is considered low.

### Additional Information Required:

Transmission line routes and potential habitat for small-whorled pogonia. Population levels of sea turtles and whales in the Seabrook area, and potential effects of facility operations on these species.

## D.58 SEQUOYAH

**Priority Level:** Moderate - High      **Level of Effort Required:** Moderate to High

### Background Information

**FES Date:** February 1974

**Commercial Operation:** Unit 1 - 1981, Unit 2 - 1982

**Location:** 525 acres on a peninsula at Tennessee River Mile 484.5 on the west shore of Chickamauga Lake about 18 miles NE of downtown Chattanooga, TN in Hamilton County.

Total Licensed Thermal Power (MWt): 6822

Cooling System: Once Through and/or Natural Draft Cooling Towers

Water Source: Chickamauga Lake (Tennessee River)

Intake/Discharge: Intake and discharge to lake

Length of transmission lines (miles): 139

### Consultation History

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	25	Aquatic Score 2:	21
	Terrestrial Score 1:	17	Terrestrial Score 2:	14

**Quality of Biological Information Examined:** Low

### Threatened and Endangered Species Information

Total # of potential Species: 62      Terrestrial: 24      Aquatic: 38

Species most likely in vicinity of the power plant site or transmission lines:

Historically there were a great number of rare mussel and fish species in the vicinity, however these are unlikely to currently inhabit Chickamauga Lake, which was created prior to the construction of the power plant. Terrestrial species likely in the area include the bald eagle, small-whorled pogonia, and large-flowered skullcap. Other species potentially in the area are the gray and Indiana bats, and possibly up to 15 additional plant species. These were identified by the GEN&SIS runs.

### Conclusions:

Adverse impacts to threatened or endangered aquatic species are probably unlikely. At least 2, and possibly many more, rare plant species are known from the vicinity of the power plant or transmission lines, and the transmission corridors are relatively long. Therefore, the potential for adverse impacts to threatened or endangered species is considered moderate to high.

### Additional Information Required:

Habitats along the transmission corridors, and locations of potential habitat for rare plant species in relation to the transmission corridors. Data from recent fish and mussel surveys in the area would help to assure that aquatic T&E species are not being impacted.

**D.59 SHOREHAM**

**Priority Level:** Low

**Level of Effort Required:** None

**Background Information**

**FES Date:** September 1972

**Commercial Operation:** none

**Location:** North Shore of Long Island, NY, at Brookhaven, Suffolk County, NY.

Total Licensed Thermal Power (MWt): 2436

Cooling System: Once Through

Water Source: Long Island Sound

Intake/Discharge: Intake canal, discharge via diffuse system

Length of transmission lines (miles): 1

**Consultation History**

No records of previous interactions with USFWS were identified.

**Ranking Results**

Aquatic Score 1: 12      Aquatic Score 2: 18

Terrestrial Score 1: 73      Terrestrial Score 2: 74

**Quality of Biological Information Examined:** Moderate

**Threatened and Endangered Species Information**

Total # of potential Species: 15      Terrestrial: 10      Aquatic: 5

Species most likely in vicinity of the power plant site or transmission lines:

The only threatened or endangered terrestrial species likely to be in the vicinity is the seabeach amaranth. Aquatic species likely to be in the area include the shortnose sturgeon, and the green, loggerhead, leatherback, and Kemp's ridley sea turtles.

**Conclusions:**

The transmission lines are extremely short, therefore adverse impacts to terrestrial species are highly unlikely. The facility has never been brought to full power, and it probably never will. Therefore the potential for adverse impacts to aquatic organisms is very low.

**Additional Information Required:**

none.

**D.60 SOUTH TEXAS**

**Priority Level: High**

**Level of Effort Required: Moderate**

**Background Information**

**FES Date:** March 1975

**Commercial Operation:** Unit 1 - 1988, Unit 2 - 1989

**Location:** West side of Colorado River, 12 miles south of Bay City, TX in Matagorda County

Total Licensed Thermal Power (MWt): 7600

Cooling System: Closed cycle cooling reservoir

Water Source: Colorado River

Intake/Discharge: Intake and discharge to bank of river

Length of transmission lines (miles): 398

**Consultation History**

1985 response from USFWS listed whooping crane, Attwater's prairie chicken, bald eagle, brown pelican, and jaquarundi as in the project area.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	6	Aquatic Score 2:	9
	Terrestrial Score 1:	2	Terrestrial Score 2:	3

**Quality of Biological Information Examined: High**

**Threatened and Endangered Species Information**

Total # of potential Species: 31      Terrestrial: 23      Aquatic: 8

Species most likely in vicinity of the power plant site or transmission lines:

Several sea turtle species are known from Matagordo bay, within 10 miles of power plant site, but these are unlikely to be found in the cooling reservoir or the adjacent Colorado river. Terrestrial species likely to be found in the vicinity of the power plant or transmission lines include whooping crane, Attwater's prairie chicken, bald eagle, brown pelican, piping plover, mountain plover, peregrine falcon, Gulf Coast hog nosed skunk, jaquarundi, and slender rush pea. Critical habitat for whooping cranes is located in adjacent counties.

**Conclusions:**

Adverse impacts to threatened or endangered aquatic species are unlikely. The transmission lines are long and there are a large number of terrestrial species potentially affected by transmission line operation and maintenance. Therefore, the potential for adverse impacts to threatened or endangered species is considered high.

**Additional Information Required:**

Distribution of known populations and potential habitat areas for each of the rare terrestrial species, and detailed maps of the transmission lines and habitats near the corridors.

**D.61 ST. LUCIE**

**Priority Level: High**

**Level of Effort Required: Moderate**

**Background Information**

**FES Date:** Unit 1 - June 1973, Unit 2 - May 1974

**Commercial Operation:** Unit 1 - 1976, Unit 2 - 1983

**Location:** Hutchinson Island in St. Lucie County, FL, halfway between Fort Pierce and Stuart.

Total Licensed Thermal Power (MWt): 5400

Cooling System: Once Through

Water Source: Atlantic Ocean

Intake/Discharge: Intake 370 m off-shore, discharge for unit 1 is 370 m off shore, for unit 2 900 m off shore.

Length of transmission lines (miles): 12.5

**Consultation History**

Interactions with USFWS and NMFS in 1981 and 1982 concerning potential disruption of sea turtle nesting, and monitoring programs were developed. Manatee had been observed in cooling water intake canal. No records were found in NUDOCs, but turtles have been impinged recently.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	8	Aquatic Score 2:	10
	Terrestrial Score 1:	8	Terrestrial Score 2:	34

**Quality of Biological Information Examined: Moderate**

**Threatened and Endangered Species Information**

Total # of potential Species: 54    Terrestrial: 46    Aquatic: 8

Species most likely in vicinity of the power plant site or transmission lines:

Manatees, and green, loggerhead, leatherback, hawksbill, and Kemp's ridley sea turtles are known to be at the power plant site. Terrestrial species include Florida scrub jay, piping plover, peregrine falcon, bald eagle, wood stork, red-cockaded woodpecker, Audubon's crested caracara, Everglade snail kite, roseate tern, Bachman's warbler, eastern indigo snake, southeastern beach mouse, Florida black bear, four-petal pawpaw, fragrant prickly-apple, scrub mint, and Lakala's mint. Critical habitats for West Indian manatee and Everglades snail kite are in St. Lucie County.

**Conclusions:**

Adverse impacts to sea turtles are occurring, and interactions with NMFS have been initiated. Many rare terrestrial species are in the vicinity of the site, but the transmission lines are short, these combine to result in a moderate potential for adverse impacts to terrestrial species of concern. Overall, the potential for adverse impacts to threatened or endangered species is considered high.

**Additional Information Required:**

Status of consultations with NMFS/USFWS concerning sea turtles, distribution of rare terrestrial species near the power plant site.

**D.62 SUMMER**

**Priority Level: Moderate - High**

**Level of Effort Required: Moderate**

**Background Information**

**FES Date:** January 1973

**Commercial Operation:** 1984

**Location:** Fairfield County, SC, 26 miles NNW of Columbia, S.C. The licensee owns or controls about 11,000 acres of land.

Total Licensed Thermal Power (MWt): 2775

Cooling System: Once Through

Water Source: Lake Monticello (reservoir)

Intake/Discharge: Intake at shoreline, discharge via holding pond.

Length of transmission lines (miles): 129

**Consultation History**

No records of previous interactions with USFWS were identified.

**Ranking Results**

Aquatic Score 1: 57      Aquatic Score 2: 59.5

Terrestrial Score 1: 34      Terrestrial Score 2: 29

**Quality of Biological Information Examined: Moderate**

**Threatened and Endangered Species Information**

Total # of potential Species: 24      Terrestrial: 22      Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are likely to be in the vicinity. Terrestrial species include the bald eagle, and the GEN&SIS runs identified red-cockaded woodpeckers and between 7 and 15 rare plant species that may be in the vicinity.

**Conclusions:**

Adverse impacts to threatened or endangered aquatic species are considered highly unlikely. There is a potential for adverse impacts to several rare plant species and red-cockaded woodpeckers along the transmission lines. Total length of the transmission lines is relatively long, and the terrain crossed by the lines is predominantly forested. Therefore, the potential for adverse impacts to threatened or endangered species is considered moderate to high.

**Additional Information Required:**

Detailed maps of the transmission lines and distribution of populations and potential habitats of rare plant species and red-cockaded woodpeckers near the transmission lines.

**D.63 SURRY**

**Priority Level: Moderate - High**

**Level of Effort Required: Moderate to High**

**Background Information**

**FES Date:** Unit 1 - May 1972, Unit 2 - June 1972

**Commercial Operation:** Unit 1 - 1972, Unit 2 - 1973

**Location:** Gravel Neck Peninsula, in the James River, Surry County, VA. 25 river miles from confluence of James River and Chesapeake Bay.

Total Licensed Thermal Power (MWt): 4882

Cooling System: Once Through

Water Source: James River

Intake/Discharge: Intake via 2.7 km canal, discharge via 880 m canal.

Length of transmission lines (miles): > 35

**Consultation History**

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	9	Aquatic Score 2:	7
	Terrestrial Score 1:	48	Terrestrial Score 2:	51

**Quality of Biological Information Examined: Moderate**

**Threatened and Endangered Species Information**

Total # of potential Species: 24      Terrestrial: 15      Aquatic: 9

Species most likely in vicinity of the power plant site or transmission lines:

All five species of east coast sea turtles are potentially in the vicinity of the power plant site. Terrestrial species known to occur in the vicinity include the bald eagle and sensitive joint-vetch. Red-cockaded woodpeckers and several other rare plant species may occur in areas near the transmission lines.

**Conclusions:**

Sea turtles may be affected by facility operations, however, the use of an intake canal probably lessens the likelihood of incidental takes. The total length and routing of the transmission lines are unclear from the description in the FES, they are at least 35 miles long and may be up to 100 miles long. Total acreage of the corridors is 4420 acres. Rare plant species, red-cockaded woodpeckers and bald eagles may be affected by maintenance of these lines. Therefore, the potential for adverse impacts to threatened or endangered species is considered moderate to high.

**Additional Information Required:**

Routes, and lengths of the transmission lines, habitats within or near the corridors, and distribution of populations and potential habitat for terrestrial species of concern. Status of sea turtle populations in the vicinity of the power plant.



## **D.64 SUSQUEHANNA**

**Priority Level:** Low

**Level of Effort Required:** Moderate

### **Background Information**

**FES Date:** June 1973

**Commercial Operation:** Unit 1 - 1983, Unit 2 - 1984

**Location:** 5 miles east of Berwick, PA on west bank of Susquehanna River, Salem Township, Luzerne County, PA. 20 Miles SW of Wilkes-Barre

Total Licensed Thermal Power (MWt): 6586

Cooling System: Natural Draft Cooling Towers

Water Source: Susquehanna River

Intake/Discharge: Intake at river shore, discharge via diffuser pipe 73 m from shore.

Length of transmission lines (miles): 60

### **Consultation History**

No records of previous interactions with USFWS were identified.

### **Ranking Results**

Aquatic Score 1: 58      Aquatic Score 2: 56

Terrestrial Score 1: 33      Terrestrial Score 2: 43

**Quality of Biological Information Examined:** Low

### **Threatened and Endangered Species Information**

Total # of potential Species: 6      Terrestrial: 5      Aquatic: 1

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are likely to be in the vicinity. Terrestrial species that may be in the area include the Indiana bat and northeastern bulrush. Bald eagles and peregrine falcons are transient in the area.

### **Conclusions:**

Adverse impacts to threatened or endangered aquatic species are highly unlikely. The northeastern bulrush may be affected by transmission line maintenance if the lines pass through wetlands inhabited by this species. However, the potential for adverse impacts to threatened or endangered species is considered low.

### **Additional Information Required:**

Detailed routes of the transmission lines and locations of wetlands in or near the transmission corridors.

**D.65 THREE MILE ISLAND**

**Priority Level:** Low

**Level of Effort Required:** Moderate

**Background Information**

**FES Date:** December 1972

**Commercial Operation:** 1974

**Location:** On the Susquehanna River, 3 miles south of Middletown, PA, in Londonderry Township, Dauphin County.

Total Licensed Thermal Power (MWt): 2568

Cooling System: Natural Draft Cooling Towers

Water Source: Susquehanna River

Intake/Discharge: Intake and discharge from river shoreline.

Length of transmission lines (miles): 90

**Consultation History**

No records of previous interactions with USFWS were identified.

**Ranking Results**

Aquatic Score 1: 61      Aquatic Score 2: 61.5

Terrestrial Score 1: 29      Terrestrial Score 2: 27

**Quality of Biological Information Examined:** Low

**Threatened and Endangered Species Information**

Total # of potential Species: 12      Terrestrial: 10      Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are likely to be in the vicinity. Terrestrial species that likely to be in the area include bald eagles and bog turtles. The northeastern bulrush, Indiana bat, and peregrine falcon also are potentially present in the area.

**Conclusions:**

Adverse impacts to threatened or endangered aquatic species are highly unlikely. The northeastern bulrush and bog turtles may be affected by transmission line maintenance if the lines pass through wetlands inhabited by these species. However, the potential for adverse impacts to threatened or endangered species is considered low.

**Additional Information Required:**

Detailed routes of the transmission lines and locations of wetlands in or near the transmission corridors.

**D.66 TROJAN**

**Priority Level: Low**

**Level of Effort Required: None**

**Background Information**

**FES Date: 1973**

**Commercial Operation: 1976**

**Location:** South shore of Columbia River, 4.5 miles SE of Rainier OR, 40 miles NNW of Portland, OR.

Total Licensed Thermal Power (MWt): 3411

Cooling System: Natural Draft Cooling Towers

Water Source: Columbia River

Intake/Discharge: Intake at river bank, discharge via pipe 110 m from shoreline.

Length of transmission lines (miles): 47

**Consultation History**

Recent interaction occurred in 1995 concerning decommissioning. USFWS also recommended that platforms be placed on cooling tower to promote peregrine falcon nesting.

**Ranking Results**

Aquatic Score 1: 28      Aquatic Score 2: 29

Terrestrial Score 1: 23      Terrestrial Score 2: 26

**Quality of Biological Information Examined: Moderate to High**

**Threatened and Endangered Species Information**

Total # of potential Species: 20      Terrestrial: 16      Aquatic: 4

Species most likely in vicinity of the power plant site or transmission lines:

Aquatic species in the vicinity of the site include Snake River runs of coho, sockeye, and chinook salmon. Terrestrial species in the vicinity include peregrine falcon, bald eagle, Columbian white-tailed deer, Aleutian Canada goose, water howelia, and Bradshaw's lomatium.

**Conclusions:**

The facility is being decommissioned, therefore the potential for adverse impacts to aquatic threatened or endangered species is unlikely. Several species may be affected by transmission lines, but these issues have or will be considered as part of the decommissioning environmental documentation.

**Additional Information Required:**

None.

**D.67 TURKEY POINT**

**Priority Level:** High

**Level of Effort Required:** Moderate

**Background Information**

**FES Date:** July 1972

**Commercial Operation:** Unit 3 - 1972, Unit 4 - 1973

**Location:** Biscayne Bay, Dade, County, FL. 25 miles S of Miami, 8 miles east of Florida City.

Total Licensed Thermal Power (MWt): 4400

Cooling System: Closed Cycle Canals

Water Source: Biscayne Bay

Intake/Discharge: Intake and discharge via 1600 ha canal system.

Length of transmission lines (miles): 19

**Consultation History**

Informal consultation with USFWS in 1980-81 concerned Manatee, brown pelican, alligators, crocodiles, bald eagle, eastern indigo snake, reddish egret, and green, leatherback, hawksbill, and Kemp's ridley sea turtles. Concluded no adverse impacts to species considered.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	3	Aquatic Score 2:	6
	Terrestrial Score 1:	7	Terrestrial Score 2:	24

**Quality of Biological Information Examined:** Moderate

**Threatened and Endangered Species Information**

Total # of potential Species: 41      Terrestrial: 32      Aquatic: 9

Species most likely in vicinity of the power plant site or transmission lines:

American crocodiles inhabit the cooling canal system. Other aquatic species known in the vicinity include manatees and all 5 species of east coast sea turtles. Terrestrial species include Cape Sable seaside sparrow, piping plover, bald eagles, wood storks, roseate tern, Everglades snail kite, Bachman's warbler, eastern indigo snake, Florida mastiff bat, Florida panther, Key deer, Florida black bear, crenulate lead plant, deltoid spurge, Garber's spurge, Small's milkpea, beach jacquemontia, and tiny polygala. Biscayne Bay is critical habitat for Manatees and Crocodiles. Critical habitats for the Cape Sable seaside sparrow and everglades snail kite are in Dade county.

**Conclusions:**

Crocodiles and manatees are monitored and managed. Sea turtles are not likely to be impacted because of the unique cooling canal system. Many terrestrial species are potentially impacted by transmission lines, but potential impacts are moderated because the lines are short. Overall, the potential for adverse impacts to threatened or endangered species is considered to be high.

**Additional Information Required:**

Use of the area by manatees, crocodiles, and sea turtles. Distribution of populations and potential habitat of terrestrial species in relation to the transmission lines.

**D.68 VERMONT YANKEE**

**Priority Level:** Low

**Level of Effort Required:** Moderate to High

**Background Information**

**FES Date:** July 1972

**Commercial Operation:** 1972

**Location:** West shore of Connecticut River, in Vernon, Windham County, VT. 4 miles N of Massachusetts border.

Total Licensed Thermal Power (MWt): 1593

Cooling System: Once Through with helper towers

Water Source: Connecticut River

Intake/Discharge: Intake and discharge at river shore.

Length of transmission lines (miles): 51 (?)

**Consultation History**

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	44	Aquatic Score 2:	47
	Terrestrial Score 1:	68.5	Terrestrial Score 2:	69.5

**Quality of Biological Information Examined:** Moderate

**Threatened and Endangered Species Information**

Total # of potential Species: 12      Terrestrial: 10      Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

There is a small potential that the dwarf wedgemussel may be in the vicinity of the power plant site. The only terrestrial species likely to be in the area is the bald eagle. The northeastern bulrush, and small-whorled pogonia may occur along the transmission lines.

**Conclusions:**

The USFWS suggested a survey for dwarf wedgemussel in the vicinity of the power plant, but they felt the potential for occurrence was slight. Bald eagles will probably not be significantly impacted by power plant or transmission line operation and maintenance. The northeastern bulrush and small-whorled pogonia may be affected by transmission line maintenance. The FES was unclear as to the amount of transmission corridor included in the license purview. It could be 51 miles, but is probably only one mile. Therefore, the potential for adverse impacts to threatened or endangered species is considered low.

**Additional Information Required:**

Actual lengths and routes of transmission lines, and habitats occurring near these lines. A diving survey for dwarf wedgemussel would determine presence or absence of dwarf wedgemussel.

## D.69 VOGTLE

**Priority Level:** High

**Level of Effort Required:** Moderate

### Background Information

**FES Date:** March 1974

**Commercial Operation:** Unit 1 - 1987, Unit 2 - 1989

**Location:** Burke County, GA, Savannah River mile 151. 15 miles ENE of Waynesboro, GA.

Total Licensed Thermal Power (MWt): 6822

Cooling System: Natural Draft Cooling Towers

Water Source: Savannah River

Intake/Discharge: Intake at river bank, single point discharge pipe near shoreline.

Length of transmission lines (miles): 557

### Consultation History

1984 consultation with USFWS concerning bald eagle, red-cockaded woodpecker, and wood stork, which are known from power plant site or transmission lines. Interaction with NMFS in 1985 concerned shortnose sturgeon in the Savannah River. Conclusions were that facility operation would not impact these species.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	31.5	Aquatic Score 2:	30.5
	Terrestrial Score 1:	4	Terrestrial Score 2:	2

**Quality of Biological Information Examined:** High

### Threatened and Endangered Species Information

Total # of potential Species: 25      Terrestrial: 23      Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

The shortnose sturgeon is known from the vicinity of the site. Terrestrial species likely to be found near the power plant or transmission lines include eastern indigo snake, gray bat, bald eagle, wood stork, red-cockaded woodpecker, Little amphianthus, blackspored quillwort, mat-forming quillwort, pondberry, Canby's dropwort, harperella, and relict trillium. The GEN&SIS runs identified 7 additional rare plant species that may occur near transmission lines.

### Conclusions:

Impacts to the shortnose sturgeon are probably minimal because of the closed cycle cooling system. Numerous terrestrial species are potentially affected by facility and transmission line operations and maintenance. The transmission line are very long, and traverse much of central Georgia. Therefore, the potential for adverse impacts to threatened or endangered species is considered high.

### Additional Information Required:

Detailed maps of transmission lines, habitats along the corridors, especially wetlands, distribution of known populations and potential habitats for the terrestrial species of concern.

## D.70 WATERFORD

**Priority Level:** Low

**Level of Effort Required:** Moderate to Low

### Background Information

**FES Date:** March 1973

**Commercial Operation:** 1985

**Location:** Mississippi River mile 129.6, St. Charles Parish, about 25 miles NW of New Orleans and 50 miles SSE of Baton Rouge, LA. The site comprises more than 3600 acres of flatland.

Total Licensed Thermal Power (MWt): 3390

Cooling System: Once Through

Water Source: Mississippi River

Intake/Discharge: Intake and discharge at river bank.

Length of transmission lines (miles): 23.5

### Consultation History

Some interaction with USFWS occurred in 1979 - 1980, but records were not recovered.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	23	Aquatic Score 2:	20
	Terrestrial Score 1:	62	Terrestrial Score 2:	62

**Quality of Biological Information Examined:** Moderate

### Threatened and Endangered Species Information

Total # of potential Species: 11      Terrestrial: 8      Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

Both the pallid sturgeon and gulf sturgeon are likely to be in the vicinity of the power plant. The bald eagle is probably the only threatened or endangered terrestrial species in the area, although the peregrine falcon is potentially present.

### Conclusions:

The two sturgeon species are potentially affected by facility operation, and records should be examined for potential takes or other effects. Water use by the facility is low compared to the volume of the Mississippi River at the site, and the intake velocity is relatively slow (1.25 - 1.7 feet per second), therefore the likelihood of incidental take is relatively low. The site should consider preparing procedures for managing incidental takes if they do occur. Impacts to rare terrestrial species are expected to be low, and the overall potential for adverse impacts to threatened or endangered species is considered low.

### Additional Information Required:

Data concerning population levels of sturgeons near the power plant site.



## D.71 WATTS BAR

**Priority Level:** Low

**Level of Effort Required:** None

### Background Information

**FES Date:** April 1995

**Commercial Operation:** 1995?

**Location:** Rhea County, TN, Tennessee River mile 528. 2 miles south of Watts Bar Dam.

Total Licensed Thermal Power (MWt): 3411

Cooling System: Natural Draft Cooling Towers

Water Source: Chickamauga Lake (Tennessee River)

Intake/Discharge: Intake from lake shore, discharge via holding pond.

Length of transmission lines (miles): 300

### Consultation History

Formal consultation with USFWS in 1994 as part of operating license. Biological Opinion covered snail darter, bald eagle, gray bat, dromedary pearlymussel, pink mucket pearlymussel, rough pigtoe, and fanshell. Concluded no adverse impacts and included incidental take permit.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	15	Aquatic Score 2:	17
	Terrestrial Score 1:	30	Terrestrial Score 2:	16

**Quality of Biological Information Examined:** Moderate

### Threatened and Endangered Species Information

Total # of potential Species: 60    Terrestrial: 22    Aquatic: 38

Species most likely in vicinity of the power plant site or transmission lines:

Snail darters, rough pigtoe, dromedary pearlymussel, pink mucket pearlymussel, and fanshells are known from the vicinity of the power plant. The USFWS in 1996 added the orange-footed pearlymussel. Prior to the construction of dams on the Tennessee River there were probably many other rare mussel and fish species in the vicinity. Terrestrial species in the area include the gray bat, bald eagle, possibly the small-whorled pogonia, large-flowered skullcap, and Virginia spirea.

### Conclusions:

Potential effects of this facility on threatened and endangered species were examined in detail in connection with the granting of the full-power operating license in 1995. Subsequent data collection did not indicate that any species are likely to be affected by facility or transmission line operation or maintenance that were not considered within the scope of the 1994-95 formal consultation. The orange footed pearly mussel is unlikely to be affected differently than the other mussel species considered.

### Additional Information Required:

None.

**D.72 WNP-2**

**Priority Level:** Low

**Level of Effort Required:** None

**Background Information**

**FES Date:** December 1972 / December 1981

**Commercial Operation:** 1984

**Location:** West bank of Columbia River, Benton County, WA. 12 Miles N of Richland, WA.

Total Licensed Thermal Power (MWt): 3323

Cooling System: Mechanical Draft Cooling Towers

Water Source: Columbia River

Intake/Discharge: Intake via 2 perforated pipe inlets 270 m from shore, discharge via pipeline 53 m from shore.

Length of transmission lines (miles): 10?

**Consultation History**

USFWS in 1980 identified the bald eagle as the only listed species in the area.

**Ranking Results**

Aquatic Score 1: 21.5    Aquatic Score 2: 28

Terrestrial Score 1: 60    Terrestrial Score 2: 64

**Quality of Biological Information Examined:** High

**Threatened and Endangered Species Information**

Total # of potential Species: 11    Terrestrial: 8    Aquatic: 3

Species most likely in vicinity of the power plant site or transmission lines:

The only threatened or endangered terrestrial species known from the area is the bald eagle. Peregrine falcons are occasional migrants in the area. Aquatic species of concern are the bull trout, sockeye salmon, and chinook salmon.

**Conclusions:**

Bald eagle populations in the area have increased since commercial operation began, indicating that this species is not being adversely impacted by facility operations. The salmon runs in the Columbia river adjacent to the power plant are not currently listed, although runs up the Snake River approximately 25 miles downstream are listed. A total of 2 bull trout were collected during preoperational monitoring, and these were apparently ocean run fish that may not be included in the populations that are currently considered candidates for listing under the ESA. Therefore, the potential for adverse impacts to threatened or endangered species is considered low.

**Additional Information Required:**

None.

### **D.73 WOLF CREEK**

**Priority Level:** Moderate - Low

**Level of Effort Required:** Moderate

#### **Background Information**

**FES Date:** October 1975 / June 1982

**Commercial Operation:** 1985

**Location:** Coffey County, KS, Near Burlington. 75 miles SW of Kansas City, 53 Miles S of Topeka, 90 miles ENE of Wichita.

Total Licensed Thermal Power (MWt): 3411

Cooling System: Closed Cycle Cooling Lake

Water Source: Wolf Creek

Intake/Discharge: Intake at shore of lake, discharge to 2060 ha cooling lake

Length of transmission lines (miles): 151

#### **Consultation History**

In 1981 the USFWS identified bald eagles and peregrine falcons as occurring in the area.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	38	Aquatic Score 2:	39
	Terrestrial Score 1:	18	Terrestrial Score 2:	12

**Quality of Biological Information Examined:** High

#### **Threatened and Endangered Species Information**

Total # of potential Species: 11    Terrestrial: 9    Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

The Neosho madtom occurs in the Neosho River very near the confluence with Wolf Creek. Terrestrial species in the vicinity include bald eagles (which nest on Wolf Creek reservoir), peregrine falcons, Mead's milkweed, and western prairie fringed orchid.

#### **Conclusions:**

The Neosho madtom could be affected by alterations of the release rate from Wolf Creek reservoir, but it is probably not adversely affected by facility operations. Bald eagles and peregrine falcons are probably not significantly affected by facility or transmission line operation and maintenance. The two plant species could be affected by transmission line maintenance if remnant tallgrass prairies stands occur along the transmission corridors. Therefore there are potential ESA issues associated with this site, but the potential for adverse impacts to threatened or endangered species is considered moderate to low.

#### **Additional Information Required:**

detailed maps of transmission lines, and potential habitat areas for Mead's milkweed and western prairie fringed orchid.

**D.74 YANKEE ROWE**

**Priority Level:** Low

**Level of Effort Required:** None

**Background Information**

**FES Date:**

**Commercial Operation:** 1961

**Location:** Franklin County, MA, 21 miles NE of Pittsfield on Deerfield River (Sherman Pond).

Total Licensed Thermal Power (MWt): 600

Cooling System: Once Through

Water Source: Deerfield River

Intake/Discharge: Intake and discharge to Sherman Pond

Length of transmission lines (miles): Short?

**Consultation History**

No records of previous interactions with USFWS were identified.

**Ranking Results**

Aquatic Score 1: 54.5    Aquatic Score 2: 54

Terrestrial Score 1: 68.5    Terrestrial Score 2: 69.5

**Quality of Biological Information Examined:** Low

**Threatened and Endangered Species Information**

Total # of potential Species: 11    Terrestrial: 9    Aquatic: 2

Species most likely in vicinity of the power plant site or transmission lines:

There are no threatened or endangered aquatic species likely to occur in the vicinity. The bald eagle is probably the only terrestrial threatened or endangered species in the area, except for transient peregrine falcons. The GEN&SIS runs identified several rare plant species the Karner Blue butterfly, and the Indian bat as potentially occurring within 20 miles of the site.

**Conclusions:**

Adverse impacts to threatened or endangered aquatic species are considered highly unlikely. The facility is being decommissioned, therefore potential impacts to terrestrial species should be considered during the decommissioning process. The potential for adverse impacts to threatened or endangered species is considered low.

**Additional Information Required:**

None.

**D.75 ZION**

**Priority Level:** Moderate - Low

**Level of Effort Required:** Moderate

**Background Information**

**FES Date:** December 1972

**Commercial Operation:** Unit 1 - 1973, Unit 2 - 1974

**Location:** Shore of Lake Michigan, in Zion Township, Lake County, IL, at edge of Zion, IL.

Total Licensed Thermal Power (MWt): 6500

Cooling System: Once Through

Water Source: Lake Michigan

Intake/Discharge: Intake from 6.7 m deep structure 790 m from shore, discharge 230 m off shore.

Length of transmission lines (miles): 89

**Consultation History**

No records of previous interactions with USFWS were identified.

<b><u>Ranking Results</u></b>	Aquatic Score 1:	70.5	Aquatic Score 2:	70.5
	Terrestrial Score 1:	24	Terrestrial Score 2:	23

**Quality of Biological Information Examined:** Moderate to High

**Threatened and Endangered Species Information**

Total # of potential Species: 10    Terrestrial: 10    Aquatic: 0

Species most likely in vicinity of the power plant site or transmission lines:

No threatened or endangered aquatic species are known from the vicinity. Terrestrial species known from the area include eastern prairie fringed orchid, Pitcher's thistle, and Karner blue butterfly. GEN&SIS indicated that piping plovers and Indiana bats may be in the area. The FES indicated that bald eagles are residents in the area, but neither the USFWS nor GEN&SIS identified this species.

**Conclusions:**

Adverse impacts to threatened or endangered aquatic species are considered highly unlikely. The prairie fringed orchid, Pitcher's thistle, and Karner blue butterfly may be affected by transmission line maintenance. However, the general area through which the transmission lines pass is generally populated and developed, so the amount of remnant native plant communities is probably small. Therefore, there are ESA issues associated with this site, and the potential for adverse impacts to threatened or endangered species is considered moderate to low.

**Additional Information Required:**

Locations of remnant prairie stands in the vicinity of the transmission lines, and the distribution of known populations of prairie fringed orchid, Pitcher's thistle, and Karner blue butterflies.

**APPENDIX E**

**Species Identified as Potentially Occurring near each Site**

# Arkansas

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E				X	X	
Birds	<i>Sterna antillarum</i>	Tern, least	E				X	X	
Clams	<i>Lampsilis orbiculata</i>	Pearlymussel, pink mucket	E					X	
Clams	<i>Lampsilis powelli</i>	Fatmucket, Arkansas	T					X	
Clams	<i>Lampsilis streckeri</i>	Pocketbook, speckled	E					X	
Crustaceans	<i>Cambarus zophonastes</i>	Crayfish, cave [no common name]	E					X	
Fishes	<i>Percina pantherina</i>	Darter, leopard	T					X	
Insects	<i>Nicrophorus americanus</i>	Beetle, American burying (=giant carrion)	E				X	X	
Mammals	<i>Myotis grisescens</i>	Bat, gray	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E					X	
Mammals	<i>Plecotus townsendii ingens</i>	Bat, Ozark big-eared	E					X	
Plants	<i>Aster furcatus</i>	Aster	SC	X					
Plants	<i>Castanea pumila ozarkensis</i>	Chinquapin, Ozark	SC	X					
Plants	<i>Geocarpon minimum</i>	None	T					X	
Plants	<i>Phlox bifida stellaria</i>	Phlox, cleft,	SC	X					
Plants	<i>Ptilimnium nodosum</i>	Harperella	E				X	X	
Snails	<i>Mesodon magazinensis</i>	Shagreen, Magazine Mountain	T				X	X	

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# Arnold

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E				X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	X
Clams	<i>Lampsilis higginsii</i>	Pearlymussel, Higgins' eye	E					X	
Clams	<i>Potamilus capax</i>	Pocketbook, fat	E				X	X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Aconitum noveboracense</i>	Northern wild monkshood	T				X	X	
Plants	<i>Aster furcatus</i>	Aster	SC	X					
Plants	<i>Eleocharis wolfii</i>		SC	X					
Plants	<i>Juglans cinerea</i>	Butternut	SC	X					
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T				X	X	X
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T				X	X	
Plants	<i>Platanthera praeclara</i>	Western prairie fringed orchid	T				X	X	X
Snails	<i>Discus macclintocki</i>	Snail, Iowa Pleistocene	E					X	

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Arnold

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# Beaver Valley

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Dendroica kirtlandii</i>	Warbler, Kirtland's	E		X				
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E		X		X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Clams	<i>Cyprogenia stegaria</i>	Fanshell	E						X
Clams	<i>Epioblasma torulosa rangiana</i>	Riffleshell, Northern	E					X	
Clams	<i>Lampsilis orbiculata</i>	Pearlymussel, pink mucket	E		X				X
Clams	<i>Obovaria retusa</i>	Mussel, ring pink (=golf stick pearlymussel)	E						X
Clams	<i>Plethobasus cooperianus</i>	Pearlymussel, orange-foot pimpleback	E		X				X
Clams	<i>Pleurobema clava</i>	Clubshell	E					X	
Clams	<i>Pleurobema plenum</i>	Pigtoe, rough	E		X				X
Fishes	<i>Acipenser fulvescens</i>	Lake sturgeon	SC	X					
Fishes	<i>Polyodon spathula</i>	Paddlefish	SC	X					
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E		X		X	X	
Plants	<i>Aconitum noveboracense</i>	Northern wild monkshood	T					X	
Plants	<i>Delphinium exaltatum</i>	Larkspur, tall	SC						X
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T		X			X	

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# Big Rock Point

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T						X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	
Clams	<i>Cyprogenia stegaria</i>	Fanshell	E					X	
Clams	<i>Epioblasma sulcata delicata</i>	Pearlymussel, White cat's paw	E					X	
Clams	<i>Epioblasma torulosa torulosa</i>	Pearlymussel, tubercled-blossom	E					X	
Clams	<i>Pleurobema clava</i>	Clubshell	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Cypripedium arietinum</i>								X
Plants	<i>Potamogeton hillii</i>								X
Plants	<i>Solidago houghtonii</i>	Houghton's goldenrod	T						X
Plants	<i>Trifolium stoloniferum</i>	Running buffalo clover	E					X	
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T					X	

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# Braidwood

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Ammodramus henslowii</i>	Sparrow, Henslow's	SC						X
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Dendroica cerulea</i>	Cerulean warbler	SC						X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T		X		X	X	X
Birds	<i>Lanius ludovicianus</i>	Shrike, Loggerhead	SC						X
Clams	<i>Plethobasus cicatricosus</i>	Pearlymussel, white wartyback	E					X	
Insects	<i>Aflexia rubranura</i>	Redveined prairie leafhopper	SC						X
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E					X	
Insects	<i>Papaipema eryngii</i>	Rattlesnake-master borer moth	SC						X
Insects	<i>Somatochlora hineana</i>	Dragonfly, Hine's (=Ohio) emerald	E				X	X	X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E		X		X	X	
Plants	<i>Agalinis skinneriana</i>	False-foxglove, purple	SC						X
Plants	<i>Asclepias meadii</i>	Mead's milkweed	T				X	X	X
Plants	<i>Aster furcatus</i>	Aster	SC						X
Plants	<i>Boltonia decurrens</i>	Decurrent false aster	T				X	X	
Plants	<i>Cirsium hillii</i>	Thistle, Hill's	SC						X
Plants	<i>Cirsium pitcheri</i>	Pitcher's thistle	T					X	
Plants	<i>Dalea foliosa</i>	Leafy prairie-clover	E						X
Plants	<i>Hymenoxys acaulis glabra</i>	Lakeside daisy	T				X	X	X
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T					X	
Plants	<i>Napaea dioica</i>		SC						X
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T				X	X	X
Reptiles	<i>Clonophis kirtlandii</i>	Kirtland's snake	SC						X
Reptiles	<i>Emydoidea blandingii</i>	Blanding's turtle	SC						X
Reptiles	<i>Sistrurus catenatus catenatus</i>	Eastern massasauga	SC						X

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# Browns Ferry

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	X
Birds	<i>Mycteria americana</i>	Stork, wood	E				X	X	
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E				X	X	X
Clams	<i>Conradilla caelata</i>	Pearlymussel, birdwing	E					X	
Clams	<i>Cyprogenia stegaria</i>	Fanshell	E					X	
Clams	<i>Epioblasma capsaeformis</i>	Oyster mussel	E					X	
Clams	<i>Epioblasma florentina curtisi</i>	Pearlymussel, Curtis'	E					X	
Clams	<i>Epioblasma metastrata</i>	Combshell, upland	E					X	
Clams	<i>Epioblasma penita</i>	Combshell, southern (=penitent mussel)	E					X	
Clams	<i>Epioblasma walkeri</i>	Riffleshell, tan	E					X	
Clams	<i>Fusconaia cuneolus</i>	Pigtoe, fine-rayed	E					X	
Clams	<i>Fusconaia edgariana</i>	Pigtoe, shiny	E				X	X	
Clams	<i>Hemistena lata</i>	Pearlymussel, cracking	E					X	
Clams	<i>Lampsilis altilis</i>	Pocketbook, fine-lined	T					X	
Clams	<i>Lampsilis orbiculata</i>	Pearlymussel, pink mucket	E				X	X	
Clams	<i>Lampsilis perovalis</i>	Mucket, orange-nacre	T					X	
Clams	<i>Lampsilis virescens</i>	Lampmussel, Alabama (=Pearlymussel,	E					X	
Clams	<i>Medionidus acutissimus</i>	Moccasinshell, Alabama	T					X	
Clams	<i>Medionidus parvulus</i>	Moccasinshell, Coosa	E					X	
Clams	<i>Obovaria retusa</i>	Mussel, ring pink (=golf stick pearlymussel)	E					X	
Clams	<i>Plethobasus cicatricosus</i>	Pearlymussel, white wartyback	E				X	X	
Clams	<i>Plethobasus cooperianus</i>	Pearlymussel, orange-foot pimpleback	E				X	X	
Clams	<i>Pleurobema decisum</i>	Clubshell, southern	E					X	
Clams	<i>Pleurobema furvum</i>	Pigtoe, dark	E					X	
Clams	<i>Pleurobema perovatum</i>	Clubshell, ovate	E					X	

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# Browns Ferry

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Clams	<i>Pleurobema plenum</i>	Pigtoe, rough	E				X	X	
Clams	<i>Pleurobema taitianum</i>	Pigtoe, heavy (=Judge Tait's mussel)	E					X	
Clams	<i>Ptychobranhus greeni</i>	Kidneyshell, triangular	E					X	
Clams	<i>Quadrula intermedia</i>	Pearlymussel, Cumberland monkeyface	E					X	
Clams	<i>Toxolasma cylindrellus</i>	Pearlymussel, pale lilliput	E					X	
Crustaceans	<i>Palaemonias alabamiae</i>	Shrimp, Alabama cave	E					X	
Fishes	<i>Etheostoma boschungii</i>	Darter, slackwater	T				X	X	
Fishes	<i>Etheostoma nuchale</i>	Darter, watercress	E					X	
Fishes	<i>Etheostoma (wapiti)</i>	Darter, boulder (=Elk River)	E				X	X	
Fishes	<i>Hybopsis monacha</i>	Chub, spotfin (=turquoise shiner)	T					X	
Fishes	<i>Percina tanasi</i>	Darter, snail	T				X	X	
Fishes	<i>Polyodon spathula</i>	Paddlefish	SC	X					
Fishes	<i>Speoplatyrhinus poulsoni</i>	Cavefish, Alabama	E				X	X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Myotis grisescens</i>	Bat, gray	E				X	X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Apios priceana</i>	Price's potato-bean	T					X	
Plants	<i>Clematis morefieldii</i>	Morefield's leather-flower	E					X	
Plants	<i>Dalea foliosa</i>	Leafy prairie-clover	E				X	X	
Plants	<i>Lesquerella lyrata</i>	Lyrate bladderpod	T				X	X	
Plants	<i>Marshallia mohrii</i>	Mohr's Barbara's buttons	T					X	
Plants	<i>Phyllitis scolopendrium americana</i>	Fern, American Hart's-tongue	T				X	X	
Plants	<i>Ptilimnium nodosum</i>	Harperella	E					X	
Plants	<i>Sagittaria secundifolia</i>	Kral's water-plantain	T					X	
Plants	<i>Sarracenia oreophila</i>	Green pitcher-plant	E					X	
Plants	<i>Thelypteris pilosa alabamensis</i>	Alabama streak-sorus fern	T					X	

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# Browns Ferry

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Trillium reliquum</i>	Relict trillium	E						X
Plants	<i>Xyris tennesseensis</i>	Tennessee yellow-eyed grass	E				X	X	
Reptiles	<i>Drymarchon corais couperi</i>	Snake, eastern indigo	T						X
Reptiles	<i>Sternotherus depressus</i>	Turtle, flattened musk	T					X	
Snails	<i>Anguispira picta</i>	Snail, painted snake coiled forest	T					X	
Snails	<i>Athearnia anthonyi</i>	Riversnail, Anthony's	E				X	X	

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Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Rana areolata capito</i>	Carolina crawfish (=gopher) frog	SC						X
Birds	<i>Aimophila aestivalis</i>	Bachman's sparrow	SC	X					X
Birds	<i>Ammodramus henslowii</i>	Sparrow, Henslow's	SC						X
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Mycteria americana</i>	Stork, wood	E				X	X	X
Birds	<i>Passerina ciris ciris</i>	Eastern painted bunting	SC	X					
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E	X			X	X	X
Clams	<i>Elliptio waccamawensis</i>	Waccamaw spike (mussel)	SC						X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E				X	X	X
Fishes	<i>Elassoma boehlkei</i>	Carolina (=barred) pygmy sunfish	SC						X
Fishes	<i>Menidia extensa</i>	Silverside, Waccamaw	T					X	
Insects	<i>Agrotis buchholzi</i>	Buchholz' dart moth	SC						X
Insects	<i>Problema bulenta</i>	Rare skipper	SC						X
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E				X	X	X
Mammals	<i>Trichechus manatus</i>	Manatee, West Indian (=Florida)	E				X	X	X
Plants	<i>Amaranthus pumilus</i>	Seabeach amaranth	T				X	X	X
Plants	<i>Amorpha georgiana georgiana</i>	Lead-plant, Georgia	SC						X
Plants	<i>Asplenium heteroresiliens</i>	Carolina spleenwort	SC						X
Plants	<i>Astragalus michauxii</i>	Milk-vetch, sandhills	SC						X
Plants	<i>Balduina atropurpurea</i>	Honeycomb Head	SC						X
Plants	<i>Campylopus carolinae</i>	Campylopus, savannah	SC						X
Plants	<i>Carex chapmanii</i>	Sedge, Chapman's	SC						X
Plants	<i>Dionaea muscipula</i>	Venus' fly-trap	SC	X					X
Plants	<i>Fimbristylis perpusilla</i>	Fimbristylis, Harper's	SC						X

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Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E					X	
Plants	<i>Kalmia cuneata</i>	White-wicky	SC						X
Plants	<i>Lindera melissifolia</i>	Pondberry	E					X	
Plants	<i>Litsea aestivalis</i>	Pondspice	SC						X
Plants	<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E				X	X	X
Plants	<i>Macbridea caroliniana</i>	Carolina birds-in-a-nest	SC						X
Plants	<i>Myriophyllum laxum</i>	Loose watermilfoil	SC						X
Plants	<i>Oxypolis canbyi</i>	Canby's dropwort	E					X	
Plants	<i>Oxypolis ternata</i>	Piedmont cowbane	SC						X
Plants	<i>Parnassia caroliniana</i>	Grass-of-parnassus, Carolina	SC						X
Plants	<i>Plantago sparsiflora</i>	Plantain, pineland	SC						X
Plants	<i>Rhexia aristosa</i>	Meadowbeauty, awned	SC						X
Plants	<i>Rhynchospora decurrens</i>	Beaked-rush	SC						X
Plants	<i>Rhynchospora thornei</i>	Beaked-rush, Thorne's	SC						X
Plants	<i>Rudbeckia heliopsidis</i>	Blackeyed Susan	SC						X
Plants	<i>Schwalbea americana</i>	American chaffseed	E					X	
Plants	<i>Solidago pulchra</i>	Goldenrod, Carolina	SC						X
Plants	<i>Solidago verna</i>	Goldenrod, spring-flowering	SC						X
Plants	<i>Sporobolus teretifolius</i>	Dropseed, wireleaf	SC						X
Plants	<i>Stylisma pickeringii</i>	Morning-glory, Pickering's	SC						X
Plants	<i>Thalictrum cooleyi</i>	Cooley's meadowrue	E				X	X	X
Plants	<i>Tofieldia glabra</i>	Bog-asphodel, smooth	SC						X
Plants	<i>Trichostema</i> sp.	Blue curls, undescribed species	SC						X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T				X	X	X
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T	X			X	X	X
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E				X	X	X

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Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E						X
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E				X	X	X
Reptiles	<i>Ophisaurus mimicus</i>	Mimic glass lizard	SC						X
Reptiles	<i>Pituophis melanoleucus melanoleucus</i>	Northern pine snake	SC	X					
Snails	<i>Planorbella magnifica</i>	Magnificent (=Cape Fear) rams-horn (snail)	SC						X
Snails	<i>Taphius eucosmius eucosmius</i>	Rams-horn, Greenfield	SC						X
Snails	<i>Triodopsis soelneri</i>	Cape Fear threetooth (snail)	SC						X

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# Byron

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	X
Clams	<i>Cyprogenia stegaria</i>	Fanshell	E					X	
Clams	<i>Lampsilis higginsii</i>	Pearlymussel, Higgins' eye	E					X	
Clams	<i>Potamilus capax</i>	Pocketbook, fat	E					X	
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E					X	
Insects	<i>Somatochlora hineana</i>	Dragonfly, Hine's (=Ohio) emerald	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	X
Plants	<i>Aconitum noveboracense</i>	Northern wild monkshood	T					X	
Plants	<i>Boltonia decurrens</i>	Decurrent false aster	T					X	
Plants	<i>Dalea foliosa</i>	Leafy prairie-clover	E						X
Plants	<i>Hymenoxys acaulis glabra</i>	Lakeside daisy	T					X	
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T				X	X	X
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T					X	X
Plants	<i>Platanthera praeclara</i>	Western prairie fringed orchid	T					X	
Snails	<i>Discus macclintocki</i>	Snail, Iowa Pleistocene	E					X	

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Byron

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# Callaway

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Ammodramus henslowii</i>	Sparrow, Henslow's	SC	X					X
Birds	<i>Dendroica cerulea</i>	Cerulean warbler	SC						X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X				X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Sterna antillarum</i>	Tern, least	E	X					
Clams	<i>Cumberlandia monodonta</i>	Spectacle case (pearlymussel)	SC						X
Clams	<i>Epioblasma triquetra</i>	Snuffbox mussel	SC						X
Clams	<i>Lampsilis higginsii</i>	Pearlymussel, Higgins' eye	E					X	
Clams	<i>Lampsilis orbiculata</i>	Pearlymussel, pink mucket	E				X	X	X
Clams	<i>Potamilus capax</i>	Pocketbook, fat	E					X	
Clams	<i>Simpsonaias ambigua</i>	Salamander mussel	SC						X
Fishes	<i>Acipenser fulvescens</i>	Lake sturgeon	SC						X
Fishes	<i>Crystallaria asprella</i>								X
Fishes	<i>Cycleptus elongatus</i>	Blue sucker	SC						X
Fishes	<i>Etheostoma nianguae</i>	Darter, Niangua	T					X	
Fishes	<i>Fundulus sciadicus</i>	Plains topminnow	SC						X
Fishes	<i>Hybognathus argyritis</i>	Western silvery minnow	SC						X
Fishes	<i>Hybognathus placitus</i>	Plains minnow	SC						X
Fishes	<i>Macrhybopsis gelida</i>	Sturgeon chub	C						X
Fishes	<i>Macrhybopsis meeki</i>	Sicklefin chub	C						X
Fishes	<i>Percina cymatotaenia</i>	Bluestripe darter	SC						X
Fishes	<i>Platygobio gracilis</i>	Flathead chub	SC						X
Fishes	<i>Polyodon spathula</i>	Paddlefish	SC	X					X
Fishes	<i>Scaphirhynchus albus</i>	Sturgeon, pallid	E				X	X	X
Insects	<i>Nicrophorus americanus</i>	Beetle, American burying (=giant carrion)	E					X	
Mammals	<i>Myotis grisescens</i>	Bat, gray	E	X			X	X	

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# Callaway

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E	X				X	X
Plants	<i>Boltonia decurrens</i>	Decurrent false aster	T					X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T					X	
Plants	<i>Trifolium stoloniferum</i>	Running buffalo clover	E				X	X	
Reptiles	<i>Macrolemys temmincki</i>	Alligator snapping turtle	SC	X					
Reptiles	<i>Sistrurus catenatus catenatus</i>	Eastern massasauga	SC	X					

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# Calvert Cliffs

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E				X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Clams	<i>Alasmidonta heterodon</i>	Mussel, dwarf wedge	E				X	X	
Crustaceans	<i>Stygobromus hayi</i>	Amphipod, Hay's Spring	E					X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E					X	
Fishes	<i>Etheostoma sellare</i>	Darter, Maryland	E					X	
Insects	<i>Cicindela dorsalis dorsalis</i>	Beetle, northeastern beach tiger	T				X	X	X
Insects	<i>Cicindela puritana</i>	Beetle, Puritan tiger	T				X	X	X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E					X	
Mammals	<i>Sciurus niger cinereus</i>	Squirrel, Delmarva Peninsula fox	E				X	X	X
Plants	<i>Aeschynomene virginica</i>	Sensitive joint-vetch	T					X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E					X	
Plants	<i>Amaranthus pumilus</i>	Seabeach amaranth	T					X	
Plants	<i>Helonias bullata</i>	Swamp pink	T				X	X	X
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	
Plants	<i>Oxypolis canbyi</i>	Canby's dropwort	E				X	X	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T				X	X	X
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E					X	
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E				X	X	X

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# Catawba

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Arachnids	<i>Microhexura montivaga</i>	Spider, spruce-fir moss	E					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T					X	X
Birds	<i>Lanius ludovicianus</i>	Shrike, Loggerhead	SC						X
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E				X	X	
Clams	<i>Lasmigona decorata</i>	Heelsplitter, Carolina	E				X	X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E					X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Myotis austroriparius</i>	Southeastern myotis (bat)	SC						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Amphianthus pusillus</i>	Little amphianthus	T				X	X	X
Plants	<i>Aster georgianus</i>	Aster, Georgia	SC						X
Plants	<i>Echinacea laevigata</i>	Smooth coneflower	E				X	X	
Plants	<i>Geum radatum</i>	Spreading avens	E					X	
Plants	<i>Gymnoderma lineare</i>	Lichen, rock gnome	E					X	
Plants	<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E				X	X	X
Plants	<i>Hexastylis naniflora</i>	Dwarf-flowered heartleaf	T				X	X	
Plants	<i>Hudsonia montana</i>	Mountain golden heather	T					X	
Plants	<i>Hymenocallis coronaria</i>	Spider-lily, shoals	SC						X
Plants	<i>Isoetes melanospora</i>	Black-spored quillwort	E				X	X	
Plants	<i>Isoetes virginica</i>	Quillwort,	SC						X
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	
Plants	<i>Liatris helleri</i>	Heller's blazingstar	T					X	
Plants	<i>Lotus purshianus helleri</i>	Trefoil, Heller's	SC						X
Plants	<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E					X	
Plants	<i>Oxypolis canbyi</i>	Canby's dropwort	E					X	

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# Catawba

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Rhus michauxii</i>	Michaux's sumac	E					X	
Plants	<i>Sisyrinchium dichotomum</i>	White irisette	E					X	
Plants	<i>Solidago spithamea</i>	Blue Ridge goldenrod	T					X	
Plants	<i>Tomanthera auriculata</i>	False-foxglove, auriculate	SC						X

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# Clinton

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Clams	<i>Plethobasus cicatricosus</i>	Pearlymussel, white wartyback	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E	X			X	X	X
Plants	<i>Asclepias meadii</i>	Mead's milkweed	T					X	
Plants	<i>Boltonia decurrens</i>	Decurrent false aster	T					X	
Plants	<i>Hymenoxys acaulis glabra</i>	Lakeside daisy	T					X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T					X	

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Clinton

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# Comanche Peak

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Chlidonias niger</i>	Black tern	SC						X
Birds	<i>Dendroica chrysoparia</i>	Warbler, golden-cheeked	E	X		X	X	X	X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X		X			
Birds	<i>Grus americana</i>	Crane, whooping	E	X		X	X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X		X	X	X	X
Birds	<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike	SC						X
Birds	<i>Mycteria americana</i>	Stork, wood	E	X		X			
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E				X	X	
Birds	<i>Plegadis chihi</i>	White-faced ibis	SC	X		X			X
Birds	<i>Sterna antillarum</i>	Tern, least	E	X		X			
Birds	<i>Vireo atricapillus</i>	Vireo, black-capped	E				X	X	X
Fishes	<i>Cycleptus elongatus</i>	Blue sucker	SC	X					
Fishes	<i>Notropis buccula</i>	Smalleye shiner	SC						X
Fishes	<i>Notropis oxyrhynchus</i>	Sharpnose shiner	SC						X
Plants	<i>Dalea reverchonii</i>	Prairie-clover, Comanche-peak	SC						X
Reptiles	<i>Nerodia harteri harteri</i>	Brazos water snake	SC	X		X			X
Reptiles	<i>Nerodia harteri paucimaculata</i>	Snake, Concho water	T					X	
Reptiles	<i>Phrynosoma cornutum</i>	Texas horned lizard	SC	X		X			X
Reptiles	<i>Thamnophis sirtalis annectens</i>	Texas garter snake	SC						X

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# Cook

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	
Clams	<i>Epioblasma torulosa torulosa</i>	Pearlymussel, tubercled-blossom	E					X	
Clams	<i>Pleurobema clava</i>	Clubshell	E					X	X
Fishes	<i>Acipenser fulvescens</i>	Lake sturgeon	SC	X					X
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E					X	
Insects	<i>Neonympha mitchellii mitchellii</i>	Butterfly, Mitchell's satyr	E				X	X	
Insects	<i>Somatochlora hineana</i>	Dragonfly, Hine's (=Ohio) emerald	E					X	
Insects	<i>Speyeria idalia</i>	Regal fritillary (butterfly)	SC						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Cirsium hillii</i>	Thistle, Hill's	SC						X
Plants	<i>Cirsium pitcheri</i>	Pitcher's thistle	T				X	X	X
Plants	<i>Hymenoxys acaulis glabra</i>	Lakeside daisy	T					X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	X
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T					X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T					X	
Reptiles	<i>Nerodia erythrogaster neglecta</i>	Northern copperbelly water snake	T				X	X	

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# Cooper

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X				X	X
Birds	<i>Grus americana</i>	Crane, whooping	E					X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Sterna antillarum</i>	Tern, least	E					X	X
Fishes	<i>Acipenser fulvescens</i>	Lake sturgeon	SC	X					
Fishes	<i>Cycleptus elongatus</i>	Blue sucker	SC	X		X			
Fishes	<i>Hybognathus argyritis</i>	Western silvery minnow	SC			X			
Fishes	<i>Hybognathus placitus</i>	Plains minnow	SC			X			
Fishes	<i>Macrhybopsis gelida</i>	Sturgeon chub	C			X			X
Fishes	<i>Macrhybopsis meeki</i>	Sicklefin chub	C						X
Fishes	<i>Platygobio gracilis</i>	Flathead chub	SC	X		X			
Fishes	<i>Polyodon spathula</i>	Paddlefish	SC	X		X			
Fishes	<i>Scaphirhynchus albus</i>	Sturgeon, pallid	E				X	X	X
Insects	<i>Nicrophorus americanus</i>	Beetle, American burying (=giant carrion)	E					X	X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T				X	X	
Plants	<i>Platanthera praeclara</i>	Western prairie fringed orchid	T				X	X	X

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# Crystal River

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Ammodramus savannarum floridanus</i>	Sparrow, Florida grasshopper	E					X	
Birds	<i>Aphelocoma coerulescens coerulescens</i>	Jay, Florida scrub	T				X	X	
Birds	<i>Caracara cheriway audubonii</i>	Caracara, Audobon's crested	T					X	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	
Birds	<i>Mycteria americana</i>	Stork, wood	E				X	X	
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E				X	X	
Birds	<i>Rostrhamus sociabilis plumbeus</i>	Kite, Everglade snail	E				X	X	
Crustaceans	<i>Palaemonetes cummingsi</i>	Shrimp, Squirrel Chimney Cave (=Florida	T					X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E					X	
Fishes	<i>Acipenser oxyrinchus desotoi</i>	Sturgeon, Gulf	T				X	X	X
Mammals	<i>Microtus pennsylvanicus dukecampbelli</i>	Vole, Florida salt marsh	E				X	X	
Mammals	<i>Mustela frenata peninsulae</i>	Florida long-tailed weasel	SC	X					
Mammals	<i>Neofiber alleni</i>	Round-tailed muskrat	SC	X					
Mammals	<i>Peromyscus floridanus</i>	Florida mouse	SC	X					
Mammals	<i>Sigmodon hispidus insulicola</i>	Insular hispid cotton rat	SC	X					
Mammals	<i>Trichechus manatus</i>	Manatee, West Indian (=Florida)	E				X	X	X
Plants	<i>Bonamia grandiflora</i>	Florida bonamia	T				X	X	
Plants	<i>Campanula robiniae</i>	Brooksville (=Robins') bellflower	E				X	X	
Plants	<i>Chionanthus pygmaeus</i>	Pygmy fringe-tree	E					X	
Plants	<i>Chrysopsis floridana</i>	Florida golden aster	E					X	
Plants	<i>Conradina brevifolia</i>	Short-leaved rosemary	E					X	
Plants	<i>Conradina etonia</i>	Etonia rosemary	E					X	
Plants	<i>Crotalaria avonensis</i>	Avon Park harebells	E					X	
Plants	<i>Dicerandra cornutissima</i>	Longspurred mint	E				X	X	
Plants	<i>Eriogonum longifolium gnaphalifolium</i>	Scrub buckwheat	T				X	X	

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# Crystal River

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Eryngium cuneifolium</i>	Snakeroot	E					X	
Plants	<i>Hypericum cumulicola</i>	Highlands scrub hypericum	E					X	
Plants	<i>Justicia cooley</i>	Cooley's water-willow	E				X	X	
Plants	<i>Liatris ohlingerae</i>	Scrub blazingstar	E					X	
Plants	<i>Lupinus aridorum</i>	Scrub lupine	E					X	
Plants	<i>Nolina brittoniana</i>	Britton's beargrass	E				X	X	
Plants	<i>Paronychia chartacea</i>	Papery whitlow-wort	T					X	
Plants	<i>Polygala lewtonii</i>	Lewton's polygala	E				X	X	
Plants	<i>Polygonella basiramia</i>	Wireweed	E					X	
Plants	<i>Prunus geniculata</i>	Scrub plum	E					X	
Plants	<i>Warea amplexifolia</i>	Wide-leaf warea	E					X	
Plants	<i>Warea carteri</i>	Carter's mustard	E					X	
Plants	<i>Ziziphus celata</i>	Florida ziziphus	E					X	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T				X	X	X
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T				X	X	X
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E				X	X	X
Reptiles	<i>Drymarchon corais couperi</i>	Snake, eastern indigo	T				X	X	
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E				X	X	X
Reptiles	<i>Eumeces egregius lividus</i>	Skink, bluetail (=blue-tailed mole	T					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E				X	X	X
Reptiles	<i>Neoseps reynoldsi</i>	Skink, sand	T				X	X	

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# Davis-Besse

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Aimophila aestivalis</i>	Bachman's sparrow	SC						X
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T	X				X	X
Birds	<i>Chlidonias niger</i>	Black tern	SC						X
Birds	<i>Dendroica kirtlandii</i>	Warbler, Kirtland's	E	X					
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Lanius ludovicianus</i>	Shrike, Loggerhead	SC	X					X
Birds	<i>Laterallus jamaicensis</i>	Black rail	SC	X					
Birds	<i>Sterna hirundo</i>	Common tern (Great Lakes population)	SC	X					X
Birds	<i>Thryomanes bewickii altus</i>	Appalachian Bewick's wren	SC	X					X
Clams	<i>Epioblasma torulosa rangiana</i>	Riffleshell, Northern	E				X	X	
Clams	<i>Epioblasma triquetra</i>	Snuffbox mussel	SC						X
Clams	<i>Pleurobema clava</i>	Clubshell	E					X	
Clams	<i>Villosa fabalis</i>	Rayed bean (mussel)	SC						X
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E				X	X	X
Insects	<i>Somatochlora hineana</i>	Dragonfly, Hine's (=Ohio) emerald	E				X	X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	X
Plants	<i>Agalinis skinneriana</i>	False-foxglove, purple	SC						X
Plants	<i>Hymenoxys acaulis glabra</i>	Lakeside daisy	T				X	X	X
Plants	<i>Juglans cinerea</i>	Butternut	SC						X
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T				X	X	X
Reptiles	<i>Clonophis kirtlandii</i>	Kirtland's snake	SC						X
Reptiles	<i>Emydoidea blandingii</i>	Blanding's turtle	SC						X
Reptiles	<i>Nerodia sipedon insularum</i>	Lake Erie water snake	PT				X	X	X
Reptiles	<i>Sistrurus catenatus catenatus</i>	Eastern massasauga	SC						X

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# Diablo Canyon

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Ambystoma californiense</i>	California tiger salamander	C						X
Amphibians	<i>Ambystoma macrodactylum croceum</i>	Salamander, Santa Cruz long-toed	E					X	
Amphibians	<i>Bufo microscaphus californicus</i>	Toad, Arroyo southwestern	E				X	X	
Amphibians	<i>Rana aurora draytoni</i>	California red-legged frog	T						X
Birds	<i>Amphispiza belli belli</i>	Bell's sage sparrow	SC	X					
Birds	<i>Aphelocoma coerulescens cana</i>	Eagle Mountain scrub jay	SC	X					
Birds	<i>Athene cunicularia hypugea</i>	Western burrowing owl	SC	X					
Birds	<i>Brachyramphus marmoratus marmoratus</i>	Murrelet, marbled	T				X	X	
Birds	<i>Branta canadensis leucopareia</i>	Goose, Aleutian Canada	T				X	X	
Birds	<i>Charadrius alexandrinus nivosus</i>	Plover, western snowy	T				X	X	X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X	X	X	X	X	X
Birds	<i>Gymnogyps californianus</i>	Condor, California	E	X			X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	
Birds	<i>Laterallus jamaicensis</i>	Black rail	SC			X			
Birds	<i>Passerculus sandwichensis beldingi</i>	Belding's savannah sparrow	SC	X					
Birds	<i>Pelecanus occidentalis</i>	Pelican, brown	E	X	X	X	X	X	X
Birds	<i>Rallus longirostris levipes</i>	Rail, light-footed clapper	E				X	X	
Birds	<i>Rallus longirostris obsoletus</i>	Rail, California clapper	E				X	X	
Birds	<i>Sterna antillarum brownii</i>	Tern, least	E		X		X	X	
Birds	<i>Vireo bellii pusillus</i>	Vireo, least Bell's	E				X	X	X
Crustaceans	<i>Branchinecta longiantenna</i>	Fairy shrimp, longhorn	E				X	X	X
Crustaceans	<i>Branchinecta lynchi</i>	Fairy shrimp, vernal pool	T					X	X
Crustaceans	<i>Lepidurus packardii</i>	Tadpole shrimp, vernal pool	E						X
Crustaceans	<i>Linderiella occidentalis</i>	California linderiella	SC				X	X	
Fishes	<i>Eucyclogobius newberryi</i>	Goby, tidewater	E			X			X
Fishes	<i>Gasterosteus aculeatus williamsoni</i>	Stickleback, unarmored threespine	E				X	X	

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# Diablo Canyon

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Fishes	<i>Salmo aguabonita whitei</i>	Trout, Little Kern golden	T					X	
Fishes	<i>Salmo clarki seleniris</i>	Trout, Paiute cutthroat	T					X	
Insects	<i>Desmocerus californicus dimorphus</i>	Beetle, valley elderberry longhorn	T					X	X
Insects	<i>Euphilotes enoptes smithi</i>	Butterfly, Smith's blue	E					X	
Insects	<i>Euproserpinus euterpe</i>	Moth, Kern primrose sphinx	T					X	
Mammals	<i>Ammospermophilus nelsoni</i>	Nelson's antelope ground squirrel	SC			X			
Mammals	<i>Arctocephalus townsendi</i>	Seal, guadalupe fur	T				X	X	
Mammals	<i>Dipodomys heermanni morroensis</i>	Kangaroo rat, Morro Bay	E				X	X	X
Mammals	<i>Dipodomys ingens</i>	Kangaroo rat, giant	E				X	X	X
Mammals	<i>Dipodomys merriami collinus</i>	Kangaroo rat, Earthquake Merriam's	SC	X					
Mammals	<i>Dipodomys merriami parvus</i>	Kangaroo rat, San Bernadino Merriam's	C	X					
Mammals	<i>Dipodomys nitratoides exilis</i>	Kangaroo rat, Fresno	E					X	X
Mammals	<i>Dipodomys nitratoides nitratoides</i>	Kangaroo rat, Tipton	E					X	X
Mammals	<i>Enhydra lutris nereis</i>	Otter, Southern sea	T		X		X	X	X
Mammals	<i>Eschrichtius robustus</i>	Whale, Gray	E		X				
Mammals	<i>Eumops perotis californicus</i>	Greater western mastiff-bat	SC	X					
Mammals	<i>Felis concolor browni</i>	Yuma puma	SC	X					
Mammals	<i>Lepus californicus bennettii</i>	San Diego black-tailed jackrabbit	SC	X					
Mammals	<i>Microtus californicus stephensi</i>	Stephens' California vole (=meadow mouse)	SC	X					
Mammals	<i>Myotis evotis</i>	Long-eared myotis (bat)	SC	X					
Mammals	<i>Myotis lucifugus occultus</i>	Occult little brown bat	SC	X					
Mammals	<i>Myotis thysanodes</i>	Fringed myotis (bat)	SC	X					
Mammals	<i>Myotis volans</i>	Long-legged myotis (bat)	SC	X					
Mammals	<i>Neotoma fuscipes luciana</i>	Monterey dusky-footed woodrat	SC	X					
Mammals	<i>Neotoma lepida intermedia</i>	San Diego desert woodrat	SC	X					
Mammals	<i>Perognathus californicus femoralis</i>	Dulzura California pocket mouse	SC	X					

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# Diablo Canyon

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Mammals	<i>Perognathus longimembris</i>	Mouse, Little pocket	SC	X					
Mammals	<i>Peromyscus maniculatus clementis</i>	San Clemente deer mouse	SC	X					
Mammals	<i>Sorex ornatus relictus</i>	Buena Vista Lake ornate shrew	C	X					X
Mammals	<i>Sylvilagus bachmani riparius</i>	Riparian brush rabbit	C	X					
Mammals	<i>Vulpes macrotis mutica</i>	Fox, San Joaquin kit	E	X			X	X	X
Plants	<i>Allium tuolumnense</i>	Onion, Rawhide Hill	PT				X	X	
Plants	<i>Arctostaphylos glandulosa crassifolia</i>	Manzanita, Del Mar (=Costa Baja,	E	X					
Plants	<i>Arctostaphylos hookeri hearstiorum</i>	Manzanita, Hearsts'	SC			X			
Plants	<i>Arctostaphylos morroensis</i>	Manzanita, Morro	T				X	X	X
Plants	<i>Arenaria paludicola</i>	Marsh sandwort	E				X	X	X
Plants	<i>Bloomeria humilis</i>	Goldenstar, dwarf	SC			X			
Plants	<i>Brodiaea pallida</i>	Brodiaea, Chinese Camp	PE				X	X	
Plants	<i>Calyptidium pulchellum</i>	Pussy-paws, Mariposa	PE				X	X	X
Plants	<i>Carpenteria californica</i>	Carpenteria	PT					X	X
Plants	<i>Castilleja campestris succulenta</i>	Owl's-clover, fleshy	PT					X	X
Plants	<i>Caulanthus californicus</i>	California jewelflower	E				X	X	X
Plants	<i>Ceanothus cuneatus rigidus</i>	Ceanothus, Monterey	SC	X					
Plants	<i>Ceanothus foliosus vineatus</i>	Ceanothus, Vine Hill	SC	X					
Plants	<i>Ceanothus hearstiorum</i>	Ceanothus, Hearst's	SC			X			
Plants	<i>Ceanothus maritimus</i>	California-lilac, maritime	SC			X			
Plants	<i>Chlorogalum purpureum reductum</i>	Amole, Cammatta Canyon	C			X			
Plants	<i>Chorizanthe pungens pungens</i>	Spineflower, Monterey	T					X	X
Plants	<i>Chorizanthe robusta</i>	Spineflower, Robust (incl. Scotts Valley)	E					X	
Plants	<i>Cirsium fontinale obispoense</i>	Thistle, Chorro Creek bog	E				X	X	X
Plants	<i>Cirsium loncholepis</i>	Thistle, La Graciosa	C			X			X
Plants	<i>Cirsium rhotophilum</i>	Thistle, surf	C			X			

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# Diablo Canyon

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				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Clarkia speciosa immaculata</i>	Clarkia, Pismo	E				X	X	X
Plants	<i>Clarkia springvillensis</i>	Clarkia, Springville	PT				X	X	
Plants	<i>Cordylanthus maritimus maritimus</i>	Salt marsh bird's-beak	E				X	X	X
Plants	<i>Cordylanthus palmatus</i>	Bird's-beak, Palmate-bracted	E					X	X
Plants	<i>Dithyrea maritima</i>	Spectacle-pod, beach	SC			X			
Plants	<i>Dudleya abramsii affinis</i>	Dudleya, San Bernardino Mountains	SC	X					
Plants	<i>Dudleya setchellii</i>	Santa Clara Valley dudleya	E					X	
Plants	<i>Dudleya traskiae</i>	Santa Barbara Island liveforever	E				X	X	
Plants	<i>Eremalche kernensis</i>	Kern mallow	E					X	X
Plants	<i>Eriastrum hooveri</i>	Hoover's woolly-star	T				X	X	X
Plants	<i>Eriodictyon altissimum</i>	Mountain balm, Indian Knob	E				X	X	X
Plants	<i>Erysimum menziesii</i>	Menzies' wallflower	E					X	
Plants	<i>Fritillaria striata</i>	Adobe-lily, Greenhorn	PT					X	X
Plants	<i>Gilia tenuiflora arenaria</i>	Monterey gilia	E					X	
Plants	<i>Horkelia cuneata sericea</i>	Horkelia, wedge-leaved	SC	X					
Plants	<i>Juglans californica hindsii</i>	Walnut, Northern California black	SC	X					
Plants	<i>Lasthenia conjugens</i>	Goldfields, Contra Costa	PT				X	X	
Plants	<i>Layia carnosa</i>	Beach layia	E				X	X	
Plants	<i>Lembertia congdonii</i>	San Joaquin woolly-threads	E				X	X	X
Plants	<i>Lupinus citrinus deflexus</i>	Lupine, Mariposa	PE				X	X	
Plants	<i>Lupinus nipomensis</i>	Lupine, Nipomo Mesa	C			X			X
Plants	<i>Lupinus tidestromii</i>	Clover lupine	E					X	
Plants	<i>Mimulus shevockii</i>	Monkey-flower, Kelso Creek	PE				X	X	
Plants	<i>Navarretia leucocephala pauciflora</i>	Navarretia, few-flowered	PE				X	X	
Plants	<i>Navarretia leucocephala plieantha</i>	Navarretia, many-flowered	PE				X	X	
Plants	<i>Navarretia setiloba</i>	Navarretia, Piute Mountains	PT				X	X	X

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# Diablo Canyon

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Opuntia treleasei</i>	Bakersfield cactus	E					X	X
Plants	<i>Orcuttia inequalis</i>	Orcutt grass, San Joaquin	PE						X
Plants	<i>Parvisedum leiocarpum</i>	Stonecrop, Lake County	PE				X	X	
Plants	<i>Pedicularis dudleyi</i>	Lousewort, Dudley's	SC			X			
Plants	<i>Pseudobahia bahiifolia</i>	Sunburst, Hartweg's golden	E						X
Plants	<i>Pseudobahia peirsonii</i>	Sunburst, San Joaquin adobe	T						X
Plants	<i>Puccinellia parishii</i>	Alkali grass, Parish's	PE					X	
Plants	<i>Quercus dumosa</i>	Oak, Nuttall's scrub	SC	X					
Plants	<i>Rorippa gambellii</i>	Gambel's watercress	E				X	X	X
Plants	<i>Sanicula maritima</i>	Sanicle, adobe	PE			X			
Plants	<i>Sidalcea hickmanii anomala</i>	Sidalcea, Cuesta Pass	SC			X			
Plants	<i>Suaeda californica</i>	Seablite, California	E				X	X	X
Plants	<i>Verbena californica</i>	Vervain, Red Hills	PT				X	X	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T		X				
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T		X				
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E		X				
Reptiles	<i>Gambelia silus</i>	Lizard, blunt-nosed leopard	E	X			X	X	X
Reptiles	<i>Gopherus agassizii</i>	Tortoise, desert	E					X	
Reptiles	<i>Lepidochelys olivacea</i>	Turtle, olive (=Pacific) ridley sea	E		X			X	
Reptiles	<i>Sceloporus graciosus graciosus</i>	Northern sagebrush lizard	SC	X					
Reptiles	<i>Thamnophis gigas</i>	Snake, giant garter	T	X				X	X
Reptiles	<i>Xantusia riversiana</i>	Lizard, Island night	T				X	X	
Snails	<i>Helminthoglypta walkeriana</i>	Snail, Morro shoulderband (=Banded dune)	E				X	X	X

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# Dresden

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T		X		X	X	X
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E					X	
Insects	<i>Somatochlora hineana</i>	Dragonfly, Hine's (=Ohio) emerald	E				X	X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	X
Plants	<i>Asclepias meadii</i>	Mead's milkweed	T					X	
Plants	<i>Boltonia decurrens</i>	Decurrent false aster	T				X	X	X
Plants	<i>Cirsium pitcheri</i>	Pitcher's thistle	T					X	
Plants	<i>Hymenoxys acaulis glabra</i>	Lakeside daisy	T		X		X	X	
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T					X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T		X		X	X	X

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Dresden

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# Farley

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Aimophila aestivalis</i>	Bachman's sparrow	SC	X					
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Mycteria americana</i>	Stork, wood	E				X	X	
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E	X			X	X	X
Birds	<i>Vermivora bachmanii</i>	Warbler, Bachman's	E	X					
Clams	<i>Lampsilis orbiculata</i>	Pearlymussel, pink mucket	E					X	
Fishes	<i>Acipenser oxyrhynchus desotoi</i>	Sturgeon, Gulf	T	X			X	X	
Fishes	<i>Elassoma alabamae</i>	Spring pygmy sunfish	SC	X					
Fishes	<i>Etheostoma okaloosae</i>	Darter, Okaloosa	E					X	
Mammals	<i>Felis concolor coryi</i>	Panther, Florida	E	X					
Mammals	<i>Myotis grisescens</i>	Bat, gray	E				X	X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Mammals	<i>Neotoma floridana magister</i>	Alleghany (=Eastern) woodrat	SC	X					
Mammals	<i>Peromyscus polionotus alloparys</i>	Mouse, Choctawahatchee beach	E					X	
Mammals	<i>Trichechus manatus</i>	Manatee, West Indian (=Florida)	E					X	
Plants	<i>Brickellia cordifolia</i>	Brickell-bush, Fly's	SC	X					
Plants	<i>Castanea pumila ozarkensis</i>	Chinquapin, Ozark	SC	X					
Plants	<i>Conradina glabra</i>	Apalachicola rosemary	E					X	
Plants	<i>Euphorbia telephiodides</i>	Telephus spurge	T					X	
Plants	<i>Harperocallis flava</i>	Harper's beauty	E					X	
Plants	<i>Macbridea alba</i>	White birds-in-a-nest	T					X	
Plants	<i>Myriophyllum laxum</i>	Loose watermilfoil	SC	X					
Plants	<i>Oxypolis canbyi</i>	Canby's dropwort	E					X	
Plants	<i>Pinguicula ionantha</i>	Godfrey's butterwort	T					X	
Plants	<i>Rhododendron chapmanii</i>	Chapman rhododendron	E					X	

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# Farley

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Schwalbea americana</i>	American chaffseed	E					X	
Plants	<i>Scutellaria floridana</i>	Florida skullcap	T					X	
Plants	<i>Silene polypetala</i>	Fringed campion	E					X	
Plants	<i>Spigelia gentianoides</i>	Gentian pinkroot	E				X	X	
Plants	<i>Thalictrum cooley</i>	Cooley's meadowrue	E					X	
Plants	<i>Torreyia taxifolia</i>	Florida torreyia	E				X	X	
Plants	<i>Trillium reliquum</i>	Relict trillium	E				X	X	X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T					X	
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T					X	
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E					X	
Reptiles	<i>Drymarchon corais couperi</i>	Snake, eastern indigo	T				X	X	X
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E					X	

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# Fermi

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E				X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	X
Birds	<i>Sterna hirundo</i>	Common tern (Great Lakes population)	SC						X
Clams	<i>Epioblasma sulcata delicata</i>	Pearlymussel, White cat's paw	E					X	X
Clams	<i>Epioblasma torulosa rangiana</i>	Riffleshell, Northern	E				X	X	
Clams	<i>Epioblasma triquetra</i>	Snuffbox mussel	SC						X
Clams	<i>Pleurobema clava</i>	Clubshell	E					X	
Clams	<i>Simpsonaias ambigua</i>	Salamander mussel	SC						X
Clams	<i>Villosa fabalis</i>	Rayed bean (mussel)	SC						X
Fishes	<i>Acipenser fulvescens</i>	Lake sturgeon	SC						X
Fishes	<i>Moxostoma valenciennesi</i>	Greater redhorse	SC	X					
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E				X	X	
Insects	<i>Neonympha mitchellii mitchellii</i>	Butterfly, Mitchell's satyr	E					X	
Insects	<i>Somatochlora hineana</i>	Dragonfly, Hine's (=Ohio) emerald	E				X	X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Hymenoxys acaulis glabra</i>	Lakeside daisy	T				X	X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T				X	X	X
Plants	<i>Poa paludigena</i>	Bluegrass, bog	SC	X					
Plants	<i>Potamogeton confervoides</i>	Pondweed,	SC	X					
Plants	<i>Solidago sphathulata gillmanii</i>	Goldenrod	SC	X					
Reptiles	<i>Nerodia erythrogaster neglecta</i>	Northern copperbelly water snake	T					X	
Reptiles	<i>Nerodia sipedon insularum</i>	Lake Erie water snake	PT				X	X	

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# Fitzpatrick

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Fishes	<i>Acipenser fulvescens</i>	Lake sturgeon	SC	X					
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	
Plants	<i>Phyllitis scolopendrium americana</i>	Fern, American Hart's-tongue	T				X	X	
Plants	<i>Sedum integrifolium leedyi</i>	Leedy's roseroot	T				X	X	
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs	X					X
Snails	<i>Succinea chittenangoensis</i>	Snail, Chittenango ovate amber	T					X	

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GS32K & GS100K = LLNL GEN&SIS runs at 32 and 100 km 1996 FWS or NMFS = 1996 Information Request.

# Fort Calhoun

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E						X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Sterna antillarum</i>	Tern, least	E				X	X	X
Fishes	<i>Cycleptus elongatus</i>	Blue sucker	SC	X		X			
Fishes	<i>Hybognathus argyritis</i>	Western silvery minnow	SC			X			
Fishes	<i>Hybognathus placitus</i>	Plains minnow	SC			X			
Fishes	<i>Macrhybopsis gelida</i>	Sturgeon chub	C			X			X
Fishes	<i>Macrhybopsis meeki</i>	Sicklefin chub	C						X
Fishes	<i>Platygobio gracilis</i>	Flathead chub	SC			X			
Fishes	<i>Polyodon spathula</i>	Paddlefish	SC			X			
Fishes	<i>Scaphirhynchus albus</i>	Sturgeon, pallid	E				X	X	X
Insects	<i>Nicrophorus americanus</i>	Beetle, American burying (=giant carrion)	E						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T				X	X	
Plants	<i>Platanthera praeclara</i>	Western prairie fringed orchid	T				X	X	X

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# Fort St. Vrain

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X					
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X					
Fishes	<i>Fundulus sciadicus</i>	Plains topminnow	SC	X					
Mammals	<i>Canis lupus</i>	Wolf, gray	E,T	X					
Mammals	<i>Myotis evotis</i>	Long-eared myotis (bat)	SC	X					
Mammals	<i>Myotis volans</i>	Long-legged myotis (bat)	SC	X					

\*FES = FES or other site documentation, FWS = previous consultations, Other = other info sources,  
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Fort St. Vrain

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# Ginna

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	
Fishes	<i>Acipenser fulvescens</i>	Lake sturgeon	SC	X					
Fishes	<i>Coregonus kiyi</i>	Kiyi	SC	X					
Fishes	<i>Coregonus reighardi</i>	Shortnose cisco	SC	X					
Mammals	<i>Myotis leibii</i>	Eastern small-footed bat	SC	X					
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	
Plants	<i>Phyllitis scolopendrium americana</i>	Fern, American Hart's-tongue	T					X	
Plants	<i>Sedum integrifolium leedyi</i>	Leedy's roseroot	T					X	
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs	X					X
Reptiles	<i>Emydoidea blandingii</i>	Blanding's turtle	SC	X					
Reptiles	<i>Thamnophis brachystoma</i>	Short-headed garter snake	SC	X					

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# Grand Gulf

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	
Birds	<i>Falco sparverius paulus</i>	Southeastern American kestrel	SC	X					
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	
Birds	<i>Lanius ludovicianus</i>	Shrike, Loggerhead	SC	X					
Birds	<i>Mycteria americana</i>	Stork, wood	E	X					
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E	X				X	
Birds	<i>Sterna antillarum</i>	Tern, least	E					X	
Birds	<i>Sterna antillarum brownii</i>	Tern, least	E				X	X	
Birds	<i>Vermivora bachmanii</i>	Warbler, Bachman's	E	X					
Fishes	<i>Acipenser oxyrinchus desotoi</i>	Sturgeon, Gulf	T				X	X	
Fishes	<i>Etheostoma rubrum</i>	Darter, bayou	T		X		X	X	
Fishes	<i>Polyodon spathula</i>	Paddlefish	SC	X					
Fishes	<i>Scaphirhynchus albus</i>	Sturgeon, pallid	E				X	X	
Mammals	<i>Myotis austroriparius</i>	Southeastern myotis (bat)	SC	X					
Mammals	<i>Plecotus rafinesquii</i>	Rafinesque's (=southeastern) big-eared bat	SC	X					
Mammals	<i>Ursus americanus</i>	Bear, American black	T,SA					X	
Mammals	<i>Ursus americanus luteolus</i>	Bear, Louisiana black	T				X	X	
Plants	<i>Crataegus triflora</i>		SC	X					
Plants	<i>Lindera melissifolia</i>	Pondberry	E					X	
Reptiles	<i>Graptemys oculifera</i>	Turtle, ringed map (=sawback)	T				X	X	
Reptiles	<i>Macrolemys temmincki</i>	Alligator snapping turtle	SC	X					

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# Haddam Neck

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	X
Birds	<i>Sterna dougallii dougallii</i>	Tern, roseate	E,T				X	X	
Clams	<i>Lampsilis cariosa</i>	Yellow lampmussel	SC	X					
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E	X			X	X	X
Insects	<i>Cicindela puritana</i>	Beetle, Puritan tiger	T				X	X	X
Insects	<i>Nicrophorus americanus</i>	Beetle, American burying (=giant carrion)	E					X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E					X	
Plants	<i>Amaranthus pumilus</i>	Seabeach amaranth	T					X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	
Plants	<i>Scirpus ancistrochaetus</i>	Northeastern (=Barbed bristle) bulrush	E					X	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T					X	
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T					X	
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs	X					
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E					X	

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# Harris

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Aimophila aestivalis</i>	Bachman's sparrow	SC						X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X	X		X	X	X
Birds	<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike	SC	X					
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E	X	X		X	X	X
Birds	<i>Vermivora bachmanii</i>	Warbler, Bachman's	E				X	X	
Clams	<i>Alasmidonta heterodon</i>	Mussel, dwarf wedge	E				X	X	X
Clams	<i>Alasmidonta varicosa</i>	Brook floater (mussel)	SC						X
Clams	<i>Elliptio judithae</i>	Neuse slabshell (mussel)	SC						X
Clams	<i>Elliptio lanceolata</i>	Yellow lance (mussel)	SC						X
Clams	<i>Elliptio steinstansana</i>	Spinymussel, Tar River	E					X	
Clams	<i>Fusconaia masoni</i>	Atlantic pigtoe (mussel)	SC						X
Clams	<i>Lampsilis cariosa</i>	Yellow lampmussel	SC						X
Clams	<i>Lasmigona subviridis</i>	Green floater (mussel)	SC						X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E					X	
Fishes	<i>Moxostoma robustum</i>	Robust (=bighead) redhorse	SC	X					
Fishes	<i>Notropis mekistocholas</i>	Shiner, Cape Fear	E	X			X	X	X
Fishes	<i>Noturus insignis</i>	Spotted madtom	SC	X					
Insects	<i>Gomphus septima</i>	Septima's clubtail (dragonfly)	SC						X
Insects	<i>Speyeria diana</i>	Diana fritillary (butterfly)	SC						X
Mammals	<i>Canis rufus</i>	Wolf, red	E				X	X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Myotis austroriparius</i>	Southeastern myotis (bat)	SC						X
Mammals	<i>Neotoma floridana haematoreia</i>	Southern Appalachian eastern woodrat	SC	X					
Plants	<i>Amorpha georgiana georgiana</i>	Lead-plant, Georgia	SC						X
Plants	<i>Astragalus michauxii</i>	Milk-vetch, sandhills	SC						X
Plants	<i>Echinacea laevigata</i>	Smooth coneflower	E				X	X	

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Harris

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# Harris

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Eupatorium resinosum</i>	Boneset, pine barrens	SC						X
Plants	<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E					X	
Plants	<i>Isoetes virginica</i>	Quillwort,	SC						X
Plants	<i>Lilium iridollae</i>	Lily, panhandle	SC						X
Plants	<i>Lindera melissifolia</i>	Pondberry	E					X	
Plants	<i>Lindera subcoriacea</i>	Bog spicebush	SC						X
Plants	<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E				X	X	
Plants	<i>Monotropsis odorata</i>	Pinesap, Sweet	SC						X
Plants	<i>Oxypolis canbyi</i>	Canby's dropwort	E					X	
Plants	<i>Oxypolis ternata</i>	Piedmont cowbane	SC						X
Plants	<i>Parnassia caroliniana</i>	Grass-of-parnassus, Carolina	SC						X
Plants	<i>Parthenium radfordii</i>	Wild-quinine, wavyleaf	SC						X
Plants	<i>Ptilimnium nodosum</i>	Harperella	E		X		X	X	X
Plants	<i>Pyxidanthra barbulata brevifolia</i>	Pixie-moss, Well's (sandhill)	SC						X
Plants	<i>Rhus michauxii</i>	Michaux's sumac	E		X		X	X	X
Plants	<i>Rudbeckia heliopsidis</i>	Blackeyed Susan	SC						X
Plants	<i>Schwalbea americana</i>	American chaffseed	E				X	X	
Plants	<i>Solidago verna</i>	Goldenrod, spring-flowering	SC						X
Plants	<i>Stylisma pickeringii</i>	Morning-glory, Pickering's	SC						X
Plants	<i>Tofieldia glabra</i>	Bog-asphodel, smooth	SC						X
Plants	<i>Trillium pusillum pusillum</i>	Trillium, Carolina	SC		X				X
Plants	<i>Xyris scabrifolia</i>	Roughleaf yelloweyed grass	SC						X

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# Hatch

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Ambystoma cingulatum</i>	Flatwoods salamander	SC						X
Amphibians	<i>Notophthalmus perstriatus</i>	Striped newt	SC						X
Amphibians	<i>Rana areolata aesopus</i>	Florida crawfish (=gopher) frog	SC						X
Amphibians	<i>Rana areolata capito</i>	Carolina crawfish (=gopher) frog	SC						X
Birds	<i>Aimophila aestivalis</i>	Bachman's sparrow	SC						X
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Dendroica kirtlandii</i>	Warbler, Kirtland's	E					X	X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Falco sparverius paulus</i>	Southeastern American kestrel	SC						X
Birds	<i>Grus americana</i>	Crane, whooping	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Mycteria americana</i>	Stork, wood	E				X	X	X
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E	X			X	X	X
Birds	<i>Thryomanes bewickii altus</i>	Appalachian Bewick's wren	SC						X
Birds	<i>Vermivora bachmanii</i>	Warbler, Bachman's	E	X				X	
Clams	<i>Alasmidonta arcula</i>	Altamaha arc-mussel	SC						X
Clams	<i>Elliptio shepardiana</i>	Altamaha lance (mussel)	SC						X
Clams	<i>Elliptio spinosa</i>	Altamaha spiny mussel (=Georgia spiny	SC	X					X
Clams	<i>Toxolasma pullus</i>	Savannah lilliput (mussel)	SC						X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E	X			X	X	X
Fishes	<i>Cyprinella callisema</i>	Ocmulgee shiner	SC						X
Insects	<i>Cordulegaster sayi</i>	Say's spiketail (dragonfly)	SC						X
Mammals	<i>Neotoma magister</i>	Alleghany (=Eastern) woodrat	SC	X					
Mammals	<i>Plecotus townsendii virginianus</i>	Bat, Virginia big-eared	E					X	
Mammals	<i>Trichechus manatus</i>	Manatee, West Indian (=Florida)	E					X	
Plants	<i>Agriponia incisa</i>	Groovebur, incised	SC						X

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# Hatch

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Balduina atropurpurea</i>	Honeycomb Head	SC						X
Plants	<i>Baptisia arachnifera</i>	Hairy rattleweed	E				X	X	X
Plants	<i>Calamintha ashei</i>	Ashe savory	SC						X
Plants	<i>Lindera melissifolia</i>	Pondberry	E				X	X	X
Plants	<i>Litsea aestivalis</i>	Pondspice	SC						X
Plants	<i>Marshallia ramosa</i>	Southern Marshallia	SC						X
Plants	<i>Matelea alabamensis</i>	Anglepod,	SC						X
Plants	<i>Myriophyllum laxum</i>	Loose watermilfoil	SC						X
Plants	<i>Oxypolis canbyi</i>	Canby's dropwort	E					X	
Plants	<i>Rudbeckia nitida nitida</i>	Coneflower, yellow	SC						X
Plants	<i>Salix floridana</i>	Willow, Florida	SC						X
Plants	<i>Scutellaria ocmulgee</i>	Skullcap, Ocmulgee	SC						X
Plants	<i>Stylisma pickeringii</i>	Morning-glory, Pickering's	SC						X
Plants	<i>Trillium reliquum</i>	Relict trillium	E						X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T					X	
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T					X	
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E					X	
Reptiles	<i>Drymarchon corais couperi</i>	Snake, eastern indigo	T				X	X	X
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E					X	
Reptiles	<i>Gopherus polyphemus</i>	Tortoise, gopher	SC						X
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E					X	
Reptiles	<i>Ophisaurus compressus</i>	Island glass lizard	SC						X
Reptiles	<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	SC						X

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# Hope Creek

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E				X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Numenius borealis</i>	Curlew, Eskimo	E					X	
Clams	<i>Alasmodonta heterodon</i>	Mussel, dwarf wedge	E					X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E		X		X	X	X
Fishes	<i>Etheostoma sellare</i>	Darter, Maryland	E					X	
Insects	<i>Agrotis buchholzi</i>	Buchholz' dart moth	SC						X
Insects	<i>Catocala pretiosa pretiosa</i>	Precious underwing (moth)	SC						X
Insects	<i>Cicindela puritana</i>	Beetle, Puritan tiger	T				X	X	
Insects	<i>Merolonche dolli</i>	Doll's merolonche	SC						X
Insects	<i>Problema bulenta</i>	Rare skipper	SC						X
Insects	<i>Spartiniphaga carterae</i>	Carter's noctuid moth	SC						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E					X	
Mammals	<i>Sciurus niger cinereus</i>	Squirrel, Delmarva Peninsula fox	E				X	X	
Plants	<i>Aeschynomene virginica</i>	Sensitive joint-vetch	T				X	X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E					X	
Plants	<i>Bidens bidentoides bidentoides</i>	Bur-marigold,	SC						X
Plants	<i>Eupatorium resinosum</i>	Boneset, pine barrens	SC						X
Plants	<i>Helonias bullata</i>	Swamp pink	T				X	X	X
Plants	<i>Hypericum adpressum</i>	Hypericum	SC						X
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	
Plants	<i>Juncus caesariensis</i>	Rush, New Jersey	SC						X
Plants	<i>Lobelia boykinii</i>	Lobelia, Boykin's	SC						X
Plants	<i>Nartheicum americanum</i>	Bog asphodel	C						X
Plants	<i>Rhynchospora knieskernii</i>	Knieskern's beaked-rush	T					X	X

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# Hope Creek

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Schwalbea americana</i>	American chaffseed	E					X	
Plants	<i>Scirpus longii</i>	Bulrush, Long's	SC						X
Plants	<i>Stylisma pickeringii</i>	Morning-glory, Pickering's	SC						X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T		X		X	X	X
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T						X
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs	X					X
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E		X		X	X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E		X		X	X	X
Reptiles	<i>Malaclemys terrapin terrapin</i>	Northern diamondback terrapin	SC	X					X
Reptiles	<i>Pituophis melanoleucus melanoleucus</i>	Northern pine snake	SC						X

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# Indian Point

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E				X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	
Birds	<i>Sterna dougallii dougallii</i>	Tern, roseate	E,T					X	
Clams	<i>Alasmidonta heterodon</i>	Mussel, dwarf wedge	E				X	X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E	X			X	X	X
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Aconitum noveboracense</i>	Northern wild monkshood	T					X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E					X	
Plants	<i>Amaranthus pumilus</i>	Seabeach amaranth	T					X	
Plants	<i>Helonias bullata</i>	Swamp pink	T					X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	
Plants	<i>Rhynchospora knieskernii</i>	Knieskern's beaked-rush	T					X	
Plants	<i>Scirpus ancistrochaetus</i>	Northeastern (=Barbed bristle) bulrush	E					X	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T					X	
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E					X	

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# Kewaunee

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Accipiter gentilis</i>	Northern goshawk	SC	X					
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Chlidonias niger</i>	Black tern	SC	X					
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T					X	X
Birds	<i>Sterna hirundo</i>	Common tern (Great Lakes population)	SC	X					
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E					X	
Insects	<i>Somatochlora hineana</i>	Dragonfly, Hine's (=Ohio) emerald	E					X	
Mammals	<i>Canis lupus</i>	Wolf, gray	E,T					X	
Plants	<i>Cirsium pitcheri</i>	Pitcher's thistle	T	X			X	X	X
Plants	<i>Gnaphalium obtusifolium saxicola</i>	Catfoot, rock,	SC	X					
Plants	<i>Iris lacustris</i>	Dwarf lake iris	T				X	X	X
Plants	<i>Mimulus glabratus michiganensis</i>	Michigan monkey-flower	E					X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T					X	X
Reptiles	<i>Emydoidea blandingii</i>	Blanding's turtle	SC	X					

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# LaCrosse

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Dendroica kirtlandii</i>	Warbler, Kirtland's	E					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T		X		X	X	X
Clams	<i>Lampsilis higginsii</i>	Pearlymussel, Higgins' eye	E		X		X	X	X
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E				X	X	
Plants	<i>Aconitum noveboracense</i>	Northern wild monkshood	T				X	X	X
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T				X	X	
Plants	<i>Platanthera praeclara</i>	Western prairie fringed orchid	T				X	X	
Plants	<i>Sedum integrifolium leedyi</i>	Leedy's roseroot	T					X	
Snails	<i>Discus macclintocki</i>	Snail, Iowa Pleistocene	E				X	X	

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# LaSalle

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X				X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Clams	<i>Cyprogenia stegaria</i>	Fanshell	E					X	
Clams	<i>Epioblasma sulcata delicata</i>	Pearlymussel, White cat's paw	E					X	
Clams	<i>Epioblasma torulosa torulosa</i>	Pearlymussel, tubercled-blossom	E					X	
Clams	<i>Obovaria retusa</i>	Mussel, ring pink (=golf stick pearlymussel)	E					X	
Clams	<i>Plethobasus cicatricosus</i>	Pearlymussel, white wartyback	E					X	
Clams	<i>Pleurobema clava</i>	Clubshell	E					X	
Clams	<i>Pleurobema plenum</i>	Pigtoe, rough	E					X	
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E					X	
Insects	<i>Somatochlora hineana</i>	Dragonfly, Hine's (=Ohio) emerald	E				X	X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E	X			X	X	X
Plants	<i>Asclepias meadii</i>	Mead's milkweed	T				X	X	
Plants	<i>Boltonia decurrens</i>	Decurrent false aster	T				X	X	X
Plants	<i>Cirsium pitcheri</i>	Pitcher's thistle	T					X	
Plants	<i>Dalea foliosa</i>	Leafy prairie-clover	E						X
Plants	<i>Hymenoxys acaulis glabra</i>	Lakeside daisy	T				X	X	
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T					X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T				X	X	

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# Limerick

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Cryptobranchus alleganiensis</i>	Hellbender	SC	X					
Birds	<i>Accipiter gentilis</i>	Northern goshawk	SC	X					
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E				X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike	SC	X					
Birds	<i>Laterallus jamaicensis</i>	Black rail	SC	X					
Birds	<i>Thryomanes bewickii altus</i>	Appalachian Bewick's wren	SC	X					
Crustaceans	<i>Stygobromus pizzinii</i>	Pizzini's amphipod	SC						X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E		X			X	
Fishes	<i>Etheostoma sellare</i>	Darter, Maryland	E					X	
Insects	<i>Cicindela puritana</i>	Beetle, Puritan tiger	T					X	
Insects	<i>Phyciodes batesi</i>	Tawny crescent butterfly	SC						X
Insects	<i>Speyeria idalia</i>	Regal fritillary (butterfly)	SC						X
Mammals	<i>Myotis leibii</i>	Eastern small-footed bat	SC	X					
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Mammals	<i>Sciurus niger cinereus</i>	Squirrel, Delmarva Peninsula fox	E				X	X	
Mammals	<i>Sylvilagus transitionalis</i>	New England cottontail rabbit	SC	X					
Plants	<i>Aeschynomene virginica</i>	Sensitive joint-vetch	T					X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E					X	
Plants	<i>Aster depauperatus</i>	Aster, serpentine	SC						X
Plants	<i>Delphinium exaltatum</i>	Larkspur, tall	SC	X					
Plants	<i>Helonias bullata</i>	Swamp pink	T					X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	
Plants	<i>Juglans cinerea</i>	Butternut	SC	X					
Plants	<i>Poa paludigena</i>	Bluegrass, bog	SC						X

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# Limerick

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Rhynchospora knieskernii</i>	Knieskern's beaked-rush	T					X	
Plants	<i>Schwalbea americana</i>	American chaffseed	E					X	
Plants	<i>Scirpus ancistrochaetus</i>	Northeastern (=Barbed bristle) bulrush	E					X	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T					X	
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs	X					X
Reptiles	<i>Clonophis kirtlandii</i>	Kirtland's snake	SC	X					
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E					X	

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# Maine Yankee

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E		X		X	X	
Fishes	<i>Salmo salar</i>	Atlantic salmon (Dennys, Machias, East	PT			X			
Mammals	<i>Felis concolor couguar</i>	Cougar, eastern	E				X	X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	

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# McGuire

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Arachnids	<i>Microhexura montivaga</i>	Spider, spruce-fir moss	E					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T					X	
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E					X	
Clams	<i>Lasmigona decorata</i>	Heelsplitter, Carolina	E				X	X	X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E					X	
Fishes	<i>Moxostoma robustum</i>	Robust (=bighead) redhorse	SC	X					
Fishes	<i>Notropis mekistocholas</i>	Shiner, Cape Fear	E					X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Glaucomys sabrinus coloratus</i>	Squirrel, Carolina northern flying	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E					X	
Mammals	<i>Neotoma magister</i>	Alleghany (=Eastern) woodrat	SC						X
Mammals	<i>Plecotus townsendii virginianus</i>	Bat, Virginia big-eared	E					X	
Plants	<i>Amphianthus pusillus</i>	Little amphianthus	T				X	X	
Plants	<i>Aster georgianus</i>	Aster, Georgia	SC						X
Plants	<i>Delphinium exaltatum</i>	Larkspur, tall	SC						X
Plants	<i>Echinacea laevigata</i>	Smooth coneflower	E					X	
Plants	<i>Geum radiatum</i>	Spreading avens	E					X	
Plants	<i>Gymnoderma lineare</i>	Lichen, rock gnome	E					X	
Plants	<i>Hedyotis purpurea montana</i>	Roan Mountain bluet	E					X	
Plants	<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E				X	X	X
Plants	<i>Hexastylis naniflora</i>	Dwarf-flowered heartleaf	T				X	X	X
Plants	<i>Hudsonia montana</i>	Mountain golden heather	T					X	
Plants	<i>Isoetes melanospora</i>	Black-spored quillwort	E					X	
Plants	<i>Isoetes virginica</i>	Quillwort,	SC						X
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	

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# McGuire

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Liatris helleri</i>	Heller's blazingstar	T					X	
Plants	<i>Lotus purshianus helleri</i>	Trefoil, Heller's	SC						X
Plants	<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E					X	
Plants	<i>Rhus michauxii</i>	Michaux's sumac	E				X	X	X
Plants	<i>Sisyrinchium dichotomum</i>	White irisette	E					X	
Plants	<i>Solidago spithamea</i>	Blue Ridge goldenrod	T					X	
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs						X

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# Millstone

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E				X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	X
Birds	<i>Sterna dougallii dougallii</i>	Tern, roseate	E,T				X	X	X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E				X	X	X
Insects	<i>Cicindela dorsalis dorsalis</i>	Beetle, northeastern beach tiger	T					X	
Insects	<i>Cicindela puritana</i>	Beetle, Puritan tiger	T				X	X	
Insects	<i>Nicrophorus americanus</i>	Beetle, American burying (=giant carrion)	E				X	X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E				X	X	
Plants	<i>Amaranthus pumilus</i>	Seabeach amaranth	T				X	X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T		X			X	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T				X	X	X
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T				X	X	X
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E						X
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E				X	X	X

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# Monticello

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E				X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	X
Clams	<i>Lampsilis higginsii</i>	Pearlymussel, Higgins' eye	E					X	
Clams	<i>Quadrula fragosa</i>	Mussel, winged mapleleaf	E					X	
Fishes	<i>Moxostoma valenciennesi</i>	Greater redhorse	SC	X					
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E				X	X	
Mammals	<i>Canis lupus</i>	Wolf, gray	E,T					X	
Plants	<i>Erythronium propullans</i>	Minnesota trout lily	E					X	
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T					X	
Plants	<i>Platanthera praeclara</i>	Western prairie fringed orchid	T				X	X	

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# Nine Mile Point

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Fishes	<i>Acipenser fulvescens</i>	Lake sturgeon	SC	X					
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	
Plants	<i>Phyllitis scolopendrium americana</i>	Fern, American Hart's-tongue	T					X	
Plants	<i>Sedum integrifolium leedyi</i>	Leedy's roseroot	T				X	X	
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs	X					X
Snails	<i>Succinea chittenangoensis</i>	Snail, Chittenango ovate amber	T					X	

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# North Anna

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Cryptobranchus alleganiensis</i>	Hellbender	SC	X					
Amphibians	<i>Plethodon shenandoah</i>	Salamander, Shenandoah	E					X	
Birds	<i>Aimophila aestivalis</i>	Bachman's sparrow	SC	X					X
Birds	<i>Contopus borealis</i>	Fly-catcher, Olive-sided	SC	X					
Birds	<i>Dendroica cerulea</i>	Cerulean warbler	SC	X					
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X				X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike	SC	X					X
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E					X	
Birds	<i>Thryomanes bewickii altus</i>	Appalachian Bewick's wren	SC	X					
Clams	<i>Alasmodonta heterodon</i>	Mussel, dwarf wedge	E			X	X	X	X
Clams	<i>Elliptio lanceolata</i>	Yellow lance (mussel)	SC			X			X
Clams	<i>Fusconaia masoni</i>	Atlantic pigtoe (mussel)	SC						X
Clams	<i>Lasmigona subviridis</i>	Green floater (mussel)	SC						X
Clams	<i>Pleurobema collina</i>	Spiny mussel, James River (=Virginia)	E				X	X	X
Crustaceans	<i>Antrolana lira</i>	Isopod, Madison Cave	T					X	
Crustaceans	<i>Stygobromus indentatus</i>	Tidewater amphipod	SC						X
Fishes	<i>Noturus insignis</i>	Spotted madtom	SC	X					
Fishes	<i>Percina rex</i>	Logperch, Roanoke	E					X	
Insects	<i>Cicindela dorsalis dorsalis</i>	Beetle, northeastern beach tiger	T					X	
Insects	<i>Speyeria idalia</i>	Regal fritillary (butterfly)	SC						X
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E					X	
Mammals	<i>Plecotus townsendii virginianus</i>	Bat, Virginia big-eared	E					X	
Mammals	<i>Sciurus niger cinereus</i>	Squirrel, Delmarva Peninsula fox	E					X	
Plants	<i>Aeschynomene virginica</i>	Sensitive joint-vetch	T					X	X

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# North Anna

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Arabis serotina</i>	Shale barren rock-cress	E					X	
Plants	<i>Echinacea laevigata</i>	Smooth coneflower	E					X	
Plants	<i>Helonias bullata</i>	Swamp pink	T				X	X	X
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	X
Plants	<i>Juglans cinerea</i>	Butternut	SC	X					X
Plants	<i>Juncus caesariensis</i>	Rush, New Jersey	SC						X
Plants	<i>Monotropsis odorata</i>	Pinesap, Sweet	SC						X
Plants	<i>Oxypolis canbyi</i>	Canby's dropwort	E					X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T					X	
Plants	<i>Poa paludigena</i>	Bluegrass, bog	SC						X
Plants	<i>Prunus alleghaniensis</i>	Plum, Alleghany	SC						X
Plants	<i>Scirpus ancistrochaetus</i>	Northeastern (=Barbed bristle) bulrush	E					X	
Plants	<i>Trillium pusillum virginianum</i>	Trillium, Virginia least	SC						X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T					X	
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs	X					
Reptiles	<i>Malaclemys terrapin terrapin</i>	Northern diamondback terrapin	SC	X					
Reptiles	<i>Pituophis melanoleucus melanoleucus</i>	Northern pine snake	SC	X					
Snails	<i>Somatogyrus virginicus</i>	Panhandle pebblesnail	SC						X

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# Oconee

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Aneides aeneus</i>	Green salamander	SC	X					X
Amphibians	<i>Cryptobranchus alleganiensis</i>	Hellbender	SC						X
Arachnids	<i>Microhexura montivaga</i>	Spider, spruce-fir moss	E					X	
Birds	<i>Aimophila aestivalis</i>	Bachman's sparrow	SC	X					
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E				X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Lanius ludovicianus</i>	Shrike, Loggerhead	SC						X
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E					X	
Clams	<i>Alasmidonta raveneliana</i>	Elktoe, Appalachian	E				X	X	
Clams	<i>Cyprogenia stegaria</i>	Fanshell	E					X	
Clams	<i>Pegias fabula</i>	Pearlymussel, little-wing	E				X	X	
Fishes	<i>Hybopsis monacha</i>	Chub, spotfin (=turquoise shiner)	T				X	X	
Fishes	<i>Percina antesella</i>	Darter, amber	E					X	
Mammals	<i>Canis rufus</i>	Wolf, red	E					X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E				X	X	
Mammals	<i>Glaucomys sabrinus coloratus</i>	Squirrel, Carolina northern flying	E				X	X	
Mammals	<i>Myotis grisescens</i>	Bat, gray	E					X	
Mammals	<i>Myotis leibii</i>	Eastern small-footed bat	SC						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	X
Mammals	<i>Neotoma floridana haematoresia</i>	Southern Appalachian eastern woodrat	SC	X					X
Mammals	<i>Plecotus rafinesquii</i>	Rafinesque's (=southeastern) big-eared bat	SC						X
Mammals	<i>Sylvilagus obscurus</i>	Appalachian cottontail	SC						X
Plants	<i>Amphianthus pusillus</i>	Little amphianthus	T					X	
Plants	<i>Aster avitus</i>	Rock-aster, Alexander's	SC						X
Plants	<i>Aster georgianus</i>	Aster, Georgia	SC						X
Plants	<i>Cardamine clematitis</i>	Bittercress, mountain	SC						X

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# Oconee

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Carex amplisquama</i>	Sedge	SC						X
Plants	<i>Carex manhartii</i>	Sedge, Manhart's	SC						X
Plants	<i>Echinacea laevigata</i>	Smooth coneflower	E				X	X	X
Plants	<i>Geum radiatum</i>	Spreading avens	E				X	X	
Plants	<i>Gymnoderma lineare</i>	Lichen, rock gnome	E				X	X	
Plants	<i>Helonias bullata</i>	Swamp pink	T				X	X	
Plants	<i>Hexastylis naniflora</i>	Dwarf-flowered heartleaf	T				X	X	X
Plants	<i>Hymenocallis coronaria</i>	Spider-lily, shoals	SC						X
Plants	<i>Hymenophyllum tunbrigense</i>	Fern, Tunbridge	SC	X					
Plants	<i>Isoetes melanospora</i>	Black-spored quillwort	E					X	
Plants	<i>Isoetes tegetiformans</i>	Mat-forming quillwort	E					X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	X
Plants	<i>Juglans cinerea</i>	Butternut	SC						X
Plants	<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E					X	
Plants	<i>Lysimachia fraseri</i>	Loosestrife,	SC						X
Plants	<i>Plagiochila caduciloba</i>	Gorge leafy liverwort	SC						X
Plants	<i>Rhus michauxii</i>	Michaux's sumac	E					X	
Plants	<i>Ribes echinellum</i>	Miccosukee gooseberry	T					X	
Plants	<i>Rudbeckia heliopsidis</i>	Blackeyed Susan	SC						X
Plants	<i>Sagittaria fasciculata</i>	Bunched arrowhead	E				X	X	
Plants	<i>Sarracenia oreophila</i>	Green pitcher-plant	E					X	
Plants	<i>Sarracenia rubra jonesii</i>	Mountain-sweet pitcher-plant	E				X	X	X
Plants	<i>Senecio millefolium</i>	Ragwort, divided-leaf	SC						X
Plants	<i>Shortia galacifolia</i>	Oconee-bells	SC	X					X
Plants	<i>Sisyrinchium dichotomum</i>	White irisette	E				X	X	
Plants	<i>Spiraea virginiana</i>	Virginia spiraea	T				X	X	

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# Oconee

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Trillium persistens</i>	Persistent trillium	E				X	X	X
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs	X					X
Reptiles	<i>Pituophis melanoleucus melanoleucus</i>	Northern pine snake	SC	X					
Snails	<i>Mesodon clarki nantahala</i>	Snail, noonday	T					X	

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# Oyster Creek

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E				X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	
Birds	<i>Numenius borealis</i>	Curlew, Eskimo	E					X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E				X	X	
Insects	<i>Agrotis buchholzi</i>	Buchholz' dart moth	SC						X
Insects	<i>Crambus daeckeellus</i>	Daecke's pyralid moth	SC						X
Insects	<i>Spartiniphaga carterae</i>	Carter's noctuid moth	SC						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E					X	
Plants	<i>Aeschynomene virginica</i>	Sensitive joint-vetch	T				X	X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E					X	
Plants	<i>Amaranthus pumilus</i>	Seabeach amaranth	T					X	
Plants	<i>Eupatorium resinosum</i>	Boneset, pine barrens	SC						X
Plants	<i>Helonias bullata</i>	Swamp pink	T				X	X	X
Plants	<i>Juncus caesariensis</i>	Rush, New Jersey	SC						X
Plants	<i>Narthecium americanum</i>	Bog asphodel	C						X
Plants	<i>Rhynchospora knieskernii</i>	Knieskern's beaked-rush	T				X	X	X
Plants	<i>Schwalbea americana</i>	American chaffseed	E				X	X	
Plants	<i>Scirpus longii</i>	Bulrush, Long's	SC						X
Plants	<i>Stylisma pickeringii</i>	Morning-glory, Pickering's	SC						X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T		X		X	X	X
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T		X				X
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs						X
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E		X			X	X
Reptiles	<i>Malaclemys terrapin terrapin</i>	Northern diamondback terrapin	SC						X
Reptiles	<i>Pituophis melanoleucus melanoleucus</i>	Northern pine snake	SC			X			X

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# Palisades

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	
Birds	<i>Sterna hirundo</i>	Common tern (Great Lakes population)	SC	X					
Clams	<i>Epioblasma torulosa torulosa</i>	Pearlymussel, tubercled-blossom	E					X	
Clams	<i>Pleurobema clava</i>	Clubshell	E					X	
Fishes	<i>Coregonus kiyi</i>	Kiyi	SC	X					
Fishes	<i>Coregonus reighardi</i>	Shortnose cisco	SC	X					
Fishes	<i>Coregonus zenithicus</i>	Shortjaw cisco	SC	X					
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E				X	X	
Insects	<i>Neonympha mitchellii mitchellii</i>	Butterfly, Mitchell's satyr	E				X	X	
Insects	<i>Nicrophorus americanus</i>	Beetle, American burying (=giant carrion)	E						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E					X	
Plants	<i>Cirsium hillii</i>	Thistle, Hill's	SC						X
Plants	<i>Cirsium pitcheri</i>	Pitcher's thistle	T				X	X	X
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T					X	
Reptiles	<i>Nerodia erythrogaster neglecta</i>	Northern copperbelly water snake	T				X	X	

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# Palo Verde

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Scaphiopus hammondi</i>	western spadefoot (toad)	SC	X					
Birds	<i>Athene cunicularia hypugea</i>	Western burrowing owl	SC	X					
Birds	<i>Buteo regalis</i>	Ferruginous hawk	SC	X					
Birds	<i>Colinus virginianus ridgwayi</i>	Bobwhite, masked (quail	E	X				X	
Birds	<i>Empidonax traillii extimus</i>	Flycatcher, southwestern willow	E						X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	X
Birds	<i>Glaucidium brasilianum cactorum</i>	Cactus ferruginous pygmy-owl	E	X			X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Lanius ludovicianus</i>	Shrike, Loggerhead	SC	X					
Birds	<i>Pelecanus occidentalis</i>	Pelican, brown	E					X	
Birds	<i>Plegadis chihi</i>	White-faced ibis	SC	X					
Birds	<i>Rallus longirostris yumanensis</i>	Rail, Yuma clapper	E	X			X	X	X
Birds	<i>Strix occidentalis lucida</i>	Owl, Mexican spotted	T	X			X	X	X
Fishes	<i>Cyprinodon macularius</i>	Pupfish, desert	E	X			X	X	X
Fishes	<i>Meda fulgida</i>	Spikedace	T	X				X	
Fishes	<i>Poeciliopsis occidentalis occidentalis</i>	Topminnow, Gila (incl. Yaqui)	E	X			X	X	X
Fishes	<i>Ptychocheilus lucius</i>	Squawfish, Colorado	E	X				X	
Fishes	<i>Salmo gilae</i>	Trout, Gila	E					X	
Fishes	<i>Tiaroga cobitis</i>	Minnow, loach	T					X	
Fishes	<i>Xyrauchen texanus</i>	Sucker, razorback	E	X				X	X
Mammals	<i>Antilocapra americana sonoriensis</i>	Pronghorn, Sonoran	E				X	X	X
Mammals	<i>Cynomys ludovicianus arizonensis</i>	Arizona black-tailed prairie dog	SC	X					
Mammals	<i>Euderma maculatum</i>	Spotted bat	SC	X					
Mammals	<i>Leptonycteris sanborni yerbabuenae</i>	Bat, lesser (=Sanborn's) long-nosed	E				X	X	X
Plants	<i>Agave arizonica</i>	Arizona agave	E				X	X	X
Plants	<i>Amsonia kearneyana</i>	Kearney's blue-star	E					X	

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# Palo Verde

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Coryphantha scheeri robustispina</i>	Pima pineapple cactus	E					X	
Plants	<i>Echinocactus horizonthalonius nicholii</i>	Nichol's Turk's head cactus	E					X	
Plants	<i>Echinocereus triglochidiatus arizonicus</i>	Arizona hedgehog cactus	E				X	X	X
Plants	<i>Purshia subintegra</i>	Arizona cliffrose	E				X	X	X
Reptiles	<i>Gopherus agassizii</i>	Tortoise, desert	E	X					
Reptiles	<i>Heloderma suspectum cinctum</i>	Banded Gila monster (Pops. W & N of	SC	X					
Reptiles	<i>Phrynosoma mcallii</i>	Flat-tailed horned lizard	PT	X				X	
Reptiles	<i>Sauromalus obesus</i>	Chuckwalla	SC	X					
Snails	<i>Sonorella eremita</i>	San Xavier talussnail	PE					X	

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# Peach Bottom

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Cryptobranchus alleganiensis</i>	Hellbender	SC	X					
Birds	<i>Chlidonias niger</i>	Black tern	SC	X					
Birds	<i>Dendroica cerulea</i>	Cerulean warbler	SC	X					
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike	SC	X					
Clams	<i>Alasmidonta heterodon</i>	Mussel, dwarf wedge	E					X	
Crustaceans	<i>Stygobromus pizzinii</i>	Pizzini's amphipod	SC						X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E				X	X	
Fishes	<i>Etheostoma sellare</i>	Darter, Maryland	E				X	X	
Flatworms	<i>Sphalloplana pricei</i>	Refton Cave planarian	SC						X
Insects	<i>Cicindela puritana</i>	Beetle, Puritan tiger	T				X	X	
Mammals	<i>Myotis leibii</i>	Eastern small-footed bat	SC	X					
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Mammals	<i>Neotoma magister</i>	Alleghany (=Eastern) woodrat	SC						X
Mammals	<i>Sciurus niger cinereus</i>	Squirrel, Delmarva Peninsula fox	E	X			X	X	
Plants	<i>Aeschynomene virginica</i>	Sensitive joint-vetch	T					X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E				X	X	
Plants	<i>Aster depauperatus</i>	Aster, serpentine	SC						X
Plants	<i>Cerastium arvense villosissimum</i>	Chickweed, Long-hairy	SC						X
Plants	<i>Euphorbia purpurea</i>	Spurge, Darlington's	SC						X
Plants	<i>Helonias bullata</i>	Swamp pink	T				X	X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	
Plants	<i>Oxypolis canbyi</i>	Canby's dropwort	E					X	
Plants	<i>Rhynchospora knieskernii</i>	Knieskern's beaked-rush	T					X	
Plants	<i>Scirpus ancistrochaetus</i>	Northeastern (=Barbed bristle) bulrush	E					X	

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# Peach Bottom

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T				X	X	
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs	X					X
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E					X	

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# Perry

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T	X				X	X
Birds	<i>Chlidonias niger</i>	Black tern	SC	X					
Birds	<i>Dendroica cerulea</i>	Cerulean warbler	SC	X					
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Sterna hirundo</i>	Common tern (Great Lakes population)	SC	X					
Clams	<i>Epioblasma obliquata obliquata</i>	Pearlymussel, purple cat's paw	E					X	
Clams	<i>Epioblasma torulosa rangiana</i>	Riffleshell, Northern	E					X	
Clams	<i>Epioblasma triquetra</i>	Snuffbox mussel	SC						X
Clams	<i>Pleurobema clava</i>	Clubshell	E				X	X	
Clams	<i>Simpsonaias ambigua</i>	Salamander mussel	SC						X
Fishes	<i>Etheostoma pellucidum</i>	Eastern sand darter	SC						X
Fishes	<i>Polyodon spathula</i>	Paddlefish	SC						X
Insects	<i>Neonympha mitchellii mitchellii</i>	Butterfly, Mitchell's satyr	E						X
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E	X		X	X	X	X
Plants	<i>Aconitum noveboracense</i>	Northern wild monkshood	T				X	X	X
Plants	<i>Astragalus neglectus</i>	Milk-vetch, Cooper's	SC						X
Plants	<i>Juglans cinerea</i>	Butternut	SC	X					X
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T					X	
Plants	<i>Poa paludigena</i>	Bluegrass, bog	SC						X
Reptiles	<i>Clonophis kirtlandii</i>	Kirtland's snake	SC	X					
Reptiles	<i>Emydoidea blandingii</i>	Blanding's turtle	SC	X					
Reptiles	<i>Sistrurus catenatus catenatus</i>	Eastern massasauga	SC	X					

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# Pilgrim

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	X
Birds	<i>Numenius borealis</i>	Curlew, Eskimo	E					X	
Birds	<i>Sterna dougallii dougallii</i>	Tern, roseate	E,T				X	X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E				X	X	
Insects	<i>Cicindela dorsalis dorsalis</i>	Beetle, northeastern beach tiger	T					X	
Insects	<i>Nicrophorus americanus</i>	Beetle, American burying (=giant carrion)	E					X	
Insects	<i>Papaipema sulphurata</i>	Decodon borer moth	SC						X
Mammals	<i>Eubalaena glacialis</i>	Whale, Right	E						X
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Megaptera novaeangliae</i>	Whale, Humpback	E						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E					X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E				X	X	
Plants	<i>Eupatorium leucolepis novae-angliae</i>	Thoroughwort, New England white-bracted,	SC						X
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T				X	X	X
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T					X	X
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E						X
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E				X	X	X
Reptiles	<i>Pseudemys rubriventris bangsi</i>	Turtle, Plymouth redbelly (=red-bellied)	E					X	X

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# Point Beach

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Accipiter gentilis</i>	Northern goshawk	SC	X					
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Chlidonias niger</i>	Black tern	SC	X					
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T					X	X
Birds	<i>Sterna hirundo</i>	Common tern (Great Lakes population)	SC	X					
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E					X	
Insects	<i>Somatochlora hineana</i>	Dragonfly, Hine's (=Ohio) emerald	E					X	
Mammals	<i>Canis lupus</i>	Wolf, gray	E,T					X	
Plants	<i>Cirsium pitcheri</i>	Pitcher's thistle	T	X			X	X	X
Plants	<i>Gnaphalium obtusifolium saxicola</i>	Catfoot, rock,	SC	X					
Plants	<i>Iris lacustris</i>	Dwarf lake iris	T				X	X	X
Plants	<i>Mimulus glabratus michiganensis</i>	Michigan monkey-flower	E					X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T					X	X
Reptiles	<i>Emydoidea blandingii</i>	Blanding's turtle	SC	X					

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# Prairie Island

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Accipiter gentilis</i>	Northern goshawk	SC	X					
Birds	<i>Chlidonias niger</i>	Black tern	SC	X					
Birds	<i>Contopus borealis</i>	Fly-catcher, Olive-sided	SC	X					
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Clams	<i>Lampsilis higginsii</i>	Pearlymussel, Higgins' eye	E	X			X	X	X
Clams	<i>Quadrula fragosa</i>	Mussel, winged mapleleaf	E					X	
Fishes	<i>Moxostoma valenciennesi</i>	Greater redhorse	SC	X					
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E				X	X	
Plants	<i>Erythronium propullans</i>	Minnesota trout lily	E				X	X	
Plants	<i>Juglans cinerea</i>	Butternut	SC	X					
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T				X	X	
Plants	<i>Platanthera praeclara</i>	Western prairie fringed orchid	T				X	X	
Plants	<i>Sedum integrifolium leedyi</i>	Leedy's roseroot	T					X	
Reptiles	<i>Emydoidea blandingii</i>	Blanding's turtle	SC	X					
Reptiles	<i>Graptemys pseudogeographica</i>	False map turtle	SC	X					
Reptiles	<i>Sistrurus catenatus catenatus</i>	Eastern massasauga	SC	X					

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# Quad Cities

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E				X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	X
Clams	<i>Cyprogenia stegaria</i>	Fanshell	E				X	X	
Clams	<i>Lampsilis higginsii</i>	Pearlymussel, Higgins' eye	E				X	X	X
Clams	<i>Potamilus capax</i>	Pocketbook, fat	E				X	X	
Fishes	<i>Polyodon spathula</i>	Paddlefish	SC	X					
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	X
Plants	<i>Aconitum noveboracense</i>	Northern wild monkshood	T					X	
Plants	<i>Boltonia decurrens</i>	Decurrent false aster	T					X	
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T				X	X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T				X	X	
Plants	<i>Platanthera praeclara</i>	Western prairie fringed orchid	T				X	X	
Snails	<i>Discus macclintocki</i>	Snail, Iowa Pleistocene	E				X	X	

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# Rancho Seco

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Ambystoma californiense</i>	California tiger salamander	C						X
Amphibians	<i>Rana aurora draytoni</i>	California red-legged frog	T						X
Amphibians	<i>Rana boylei</i>	Foothill yellow-legged frog	SC						X
Amphibians	<i>Scaphiopus hammondi</i>	western spadefoot (toad)	SC						X
Birds	<i>Agelaius tricolor</i>	Tricolored blackbird	SC						X
Birds	<i>Athene cunicularia hypugea</i>	Western burrowing owl	SC						X
Birds	<i>Branta canadensis leucopareia</i>	Goose, Aleutian Canada	T						X
Birds	<i>Buteo regalis</i>	Ferruginous hawk	SC						X
Birds	<i>Charadrius montanus</i>	Mountain plover	C	X					X
Birds	<i>Empidonax traillii brewsteri</i>	Little willow flycatcher	SC						X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E						X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T						X
Birds	<i>Lanius ludovicianus</i>	Shrike, Loggerhead	SC	X					
Birds	<i>Plegadis chihi</i>	White-faced ibis	SC						X
Crustaceans	<i>Branchinecta lynchi</i>	Fairy shrimp, vernal pool	T						X
Crustaceans	<i>Lepidurus packardii</i>	Tadpole shrimp, vernal pool	E						X
Fishes	<i>Acipenser medirostris</i>	Green sturgeon	SC						X
Fishes	<i>Anthicus antiochensis</i>	Antioch Dunes anthicid (beetle)	SC						X
Fishes	<i>Hypomesus transpacificus</i>	Smelt, delta	T						X
Fishes	<i>Lampetra ayresi</i>	River Lamprey	SC						X
Fishes	<i>Lampetra hubbsi</i>	Kern Brook lamprey	SC						X
Fishes	<i>Lampetra tridentata</i>	Pacific lamprey	SC						X
Fishes	<i>Oncorhynchus tshawytscha</i>	Salmon, chinook	E,T						X
Fishes	<i>Pogonichthys macrolepidotus</i>	Sacramento splittail	PT						X
Fishes	<i>Spirinchus thaleichthys</i>	Longfin smelt (Delta population)	SC						X
Insects	<i>Anthicus sacramento</i>	Sacramento anthicid (beetle)	SC						X

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# Rancho Seco

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Insects	<i>Desmocerus californicus dimorphus</i>	Beetle, valley elderberry longhorn	T						X
Insects	<i>Lytta molesta</i>	Molestan blister beetle	SC						X
Mammals	<i>Eumops perotis californicus</i>	Greater western mastiff-bat	SC						X
Mammals	<i>Myotis ciliolabrum</i>	Small-footed myotis (bat)	SC						X
Mammals	<i>Myotis evotis</i>	Long-eared myotis (bat)	SC						X
Mammals	<i>Myotis thysanodes</i>	Fringed myotis (bat)	SC						X
Mammals	<i>Myotis volans</i>	Long-legged myotis (bat)	SC						X
Mammals	<i>Myotis yumanensis</i>	Yuma myotis (bat)	SC						X
Mammals	<i>Neotoma fuscipes riparia</i>	San Joaquin Valley woodrat	C						X
Mammals	<i>Perognathus inoratus</i>	San Joaquin pocket mouse (includes all ssp.)	SC						X
Mammals	<i>Plecotus townsendii townsendii</i>	Pacific Townsend's big-eared bat	SC						X
Mammals	<i>Sylvilagus bachmani riparius</i>	Riparian brush rabbit	C						X
Mammals	<i>Vulpes macrotis mutica</i>	Fox, San Joaquin kit	E						X
Plants	<i>Eryngium racemosum</i>	Coyote-thistle, Delta	SC						X
Plants	<i>Legenere limosa</i>	Legenere	SC						X
Plants	<i>Orcuttia viscida</i>	Orcutt grass, Sacramento	PE						X
Plants	<i>Sagittaria sanfordii</i>	Sagittaria, valley	SC						X
Reptiles	<i>Anniella pulchra pulchra</i>	Silvery legless lizard	SC						X
Reptiles	<i>Clemmys marmorata marmorata</i>	Northwestern pond turtle	SC						X
Reptiles	<i>Clemmys marmorata pallida</i>	Southwestern pond turtle	SC						X
Reptiles	<i>Phrynosoma coronatum frontale</i>	California horned lizard	SC						X
Reptiles	<i>Thamnophis gigas</i>	Snake, giant garter	T						X

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# River Bend

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	
Birds	<i>Pelecanus occidentalis</i>	Pelican, brown	E					X	
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E		X		X	X	
Clams	<i>Margaritifera hembeli</i>	Pearlshell, Louisiana	T					X	
Clams	<i>Potamilus inflatus</i>	Heelsplitter, inflated	T				X	X	
Fishes	<i>Acipenser oxyrhynchus desotoi</i>	Sturgeon, Gulf	T				X	X	
Fishes	<i>Scaphirhynchus albus</i>	Sturgeon, pallid	E				X	X	X
Mammals	<i>Ursus americanus</i>	Bear, American black	T,SA					X	
Mammals	<i>Ursus americanus luteolus</i>	Bear, Louisiana black	T				X	X	X
Plants	<i>Isoetes louisianensis</i>	Louisiana quillwort	E					X	
Reptiles	<i>Gopherus polyphemus</i>	Tortoise, gopher	SC					X	
Reptiles	<i>Graptemys oculifera</i>	Turtle, ringed map (=sawback)	T					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E					X	

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# Robinson

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	
Birds	<i>Lanius ludovicianus</i>	Shrike, Loggerhead	SC						X
Birds	<i>Mycteria americana</i>	Stork, wood	E					X	
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E	X			X	X	X
Clams	<i>Lasmigona decorata</i>	Heelsplitter, Carolina	E					X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E					X	X
Fishes	<i>Notropis mekistocholas</i>	Shiner, Cape Fear	E					X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E				X	X	
Mammals	<i>Plecotus rafinesquii</i>	Rafinesque's (=southeastern) big-eared bat	SC						X
Plants	<i>Amaranthus pumilus</i>	Seabeach amaranth	T					X	
Plants	<i>Amorpha georgiana georgiana</i>	Lead-plant, Georgia	SC						X
Plants	<i>Amphianthus pusillus</i>	Little amphianthus	T				X	X	
Plants	<i>Aster georgianus</i>	Aster, Georgia	SC						X
Plants	<i>Astragalus michauxii</i>	Milk-vetch, sandhills	SC						X
Plants	<i>Balduina atropurpurea</i>	Honeycomb Head	SC						X
Plants	<i>Echinacea laevigata</i>	Smooth coneflower	E				X	X	
Plants	<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E					X	
Plants	<i>Isoetes melanospora</i>	Black-spored quillwort	E				X	X	
Plants	<i>Isoetes virginica</i>	Quillwort,	SC						X
Plants	<i>Kalmia cuneata</i>	White-wicky	SC						X
Plants	<i>Lindera melissifolia</i>	Pondberry	E					X	
Plants	<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E				X	X	X
Plants	<i>Macbridea caroliniana</i>	Carolina birds-in-a-nest	SC						X
Plants	<i>Oxypolis canbyi</i>	Canby's dropwort	E				X	X	

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# Robinson

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Oxypolis ternata</i>	Piedmont cowbane	SC						X
Plants	<i>Pyxidanthra barbulata brevifolia</i>	Pixie-moss, Well's (sandhill)	SC						X
Plants	<i>Rhexia aristosa</i>	Meadowbeauty, awned	SC						X
Plants	<i>Rhus michauxii</i>	Michaux's sumac	E				X	X	
Plants	<i>Schwalbea americana</i>	American chaffseed	E					X	
Plants	<i>Solidago verna</i>	Goldenrod, spring-flowering	SC						X
Plants	<i>Thalictrum cooley</i>	Cooley's meadowrue	E					X	
Plants	<i>Tofieldia glabra</i>	Bog-asphodel, smooth	SC						X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T					X	
Reptiles	<i>Ophisaurus mimicus</i>	Mimic glass lizard	SC	X					

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# Salem

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Numenius borealis</i>	Curlew, Eskimo	E					X	
Clams	<i>Alasmidonta heterodon</i>	Mussel, dwarf wedge	E					X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E		X		X	X	X
Fishes	<i>Etheostoma sellare</i>	Darter, Maryland	E					X	
Insects	<i>Agrotis buchholzi</i>	Buchholz' dart moth	SC						X
Insects	<i>Catocala pretiosa pretiosa</i>	Precious underwing (moth)	SC						X
Insects	<i>Cicindela puritana</i>	Beetle, Puritan tiger	T				X	X	
Insects	<i>Merolonche dolli</i>	Doll's merolonche	SC						X
Insects	<i>Problema bulenta</i>	Rare skipper	SC						X
Insects	<i>Spartiniphaga carterae</i>	Carter's noctuid moth	SC						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E					X	
Mammals	<i>Sciurus niger cinereus</i>	Squirrel, Delmarva Peninsula fox	E				X	X	
Plants	<i>Aeschynomene virginica</i>	Sensitive joint-vetch	T				X	X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E					X	
Plants	<i>Bidens bidentoides bidentoides</i>	Bur-marigold,	SC						X
Plants	<i>Eupatorium resinosum</i>	Boneset, pine barrens	SC						X
Plants	<i>Helonias bullata</i>	Swamp pink	T				X	X	X
Plants	<i>Hypericum adpressum</i>	Hypericum	SC						X
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	
Plants	<i>Juncus caesariensis</i>	Rush, New Jersey	SC						X
Plants	<i>Lobelia boykinii</i>	Lobelia, Boykin's	SC						X
Plants	<i>Narthecium americanum</i>	Bog asphodel	C						X
Plants	<i>Rhynchospora knieskernii</i>	Knieskern's beaked-rush	T					X	X

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# Salem

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Schwalbea americana</i>	American chaffseed	E					X	
Plants	<i>Scirpus longii</i>	Bulrush, Long's	SC						X
Plants	<i>Stylisma pickeringii</i>	Morning-glory, Pickering's	SC						X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T		X		X	X	X
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T						X
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs	X					X
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E		X		X	X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E		X		X	X	X
Reptiles	<i>Malaclemys terrapin terrapin</i>	Northern diamondback terrapin	SC	X					X
Reptiles	<i>Pituophis melanoleucus melanoleucus</i>	Northern pine snake	SC						X

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# San Onofre

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Batrachoseps aridus</i>	Salamander, desert slender	E				X	X	
Amphibians	<i>Bufo microscaphus californicus</i>	Toad, Arroyo southwestern	E	X			X	X	X
Amphibians	<i>Ensatina eschscholtzii croceator</i>	Yellow-blotched ensatina	SC	X					
Amphibians	<i>Ensatina eschscholtzii klauberi</i>	Large-blotched ensatina	SC	X					
Amphibians	<i>Rana aurora draytoni</i>	California red-legged frog	T	X					X
Amphibians	<i>Scaphiopus hammondi</i>	western spadefoot (toad)	SC	X					
Birds	<i>Agelaius tricolor</i>	Tricolored blackbird	SC	X					
Birds	<i>Aimophila ruficeps canescens</i>	Southern California rufous-crowned sparrow	SC	X					
Birds	<i>Amphispiza belli belli</i>	Bell's sage sparrow	SC	X					
Birds	<i>Amphispiza belli clementeae</i>	Sparrow, San Clemente sage	T					X	
Birds	<i>Aphelocoma coerulescens cana</i>	Eagle Mountain scrub jay	SC	X					
Birds	<i>Athene cunicularia hypugea</i>	Western burrowing owl	SC	X					
Birds	<i>Brachyramphus marmoratus marmoratus</i>	Murrelet, marbled	T				X	X	
Birds	<i>Branta canadensis leucopareia</i>	Goose, Aleutian Canada	T				X	X	
Birds	<i>Charadrius alexandrinus nivosus</i>	Plover, western snowy	T	X			X	X	X
Birds	<i>Chlidonias niger</i>	Black tern	SC	X					
Birds	<i>Dendrocygna bicolor</i>	Fulvous whistling duck (SW U.S. population)	SC	X					
Birds	<i>Empidonax traillii eximius</i>	Flycatcher, southwestern willow	E	X			X	X	X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	X
Birds	<i>Geothlypis trichas sinuosa</i>	Saltmarsh common yellowthroat	SC	X					
Birds	<i>Gymnogyps californianus</i>	Condor, California	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Lanius ludovicianus</i>	Shrike, Loggerhead	SC	X					
Birds	<i>Lanius ludovicianus mearnsi</i>	Shrike, San Clemente loggerhead	E					X	
Birds	<i>Melospiza melodia maxillaris</i>	Suisun song sparrow	SC	X					
Birds	<i>Melospiza melodia pusillula</i>	Alameda (South Bay) song sparrow	SC	X					

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# San Onofre

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				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Melospiza melodia samuelis</i>	San Pablo song sparrow	SC	X					
Birds	<i>Passerculus sandwichensis beldingi</i>	Belding's savannah sparrow	SC	X					
Birds	<i>Pelecanus occidentalis</i>	Pelican, brown	E	X			X	X	X
Birds	<i>Plegadis chihi</i>	White-faced ibis	SC	X					
Birds	<i>Polioptila californica californica</i>	Gnatcatcher, coastal California	T	X			X	X	X
Birds	<i>Rallus longirostris levipes</i>	Rail, light-footed clapper	E	X			X	X	X
Birds	<i>Rallus longirostris yumanensis</i>	Rail, Yuma clapper	E				X	X	
Birds	<i>Sterna antillarum brownii</i>	Tern, least	E	X			X	X	X
Birds	<i>Sterna elegans</i>	Elegant tern	SC	X					
Birds	<i>Vireo bellii pusillus</i>	Vireo, least Bell's	E	X			X	X	X
Crustaceans	<i>Branchinecta lynchi</i>	Fairy shrimp, vernal pool	T				X	X	
Crustaceans	<i>Branchinecta sandiegoensis</i>	San Diego fairy shrimp	E				X	X	
Crustaceans	<i>Linderiella occidentalis</i>	California linderiella	SC				X	X	
Crustaceans	<i>Streptocephalus woottoni</i>	Fairy shrimp, Riverside	E				X	X	X
Fishes	<i>Cyprinodon macularius</i>	Pupfish, desert	E				X	X	
Fishes	<i>Eucyclogobius newberryi</i>	Goby, tidewater	E						X
Fishes	<i>Gasterosteus aculeatus williamsoni</i>	Stickleback, unarmored threespine	E				X	X	
Fishes	<i>Gila bicolor mohavensis</i>	Chub, Mohave tui	E				X	X	
Fishes	<i>Gila elegans</i>	Chub, bonytail	E				X	X	
Fishes	<i>Ptychocheilus lucius</i>	Squawfish, Colorado	E				X	X	
Fishes	<i>Xyrauchen texanus</i>	Sucker, razorback	E				X	X	
Insects	<i>Euphilotes battoides allyni</i>	Butterfly, El Segundo blue	E					X	
Insects	<i>Euphydryas editha quino</i>	Quino checkerspot (butterfly)	E				X	X	
Insects	<i>Glaucopsyche lygdamus</i>	Butterfly, Palos Verdes blue	E					X	
Insects	<i>Pyrgus ruralis lagunae</i>	Laguna Mountains skipper	E				X	X	
Insects	<i>Rhaphiomidas terminatus abdominalis</i>	Fly, Delhi Sands flower-loving	E				X	X	

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# San Onofre

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Mammals	<i>Choeronycteris mexicana</i>	Mexican long-tongued bat	SC	X					
Mammals	<i>Dipodomys heermanni morroensis</i>	Kangaroo rat, Morro Bay	E	X					
Mammals	<i>Dipodomys stephensi</i>	Kangaroo rat, Stephens'	E				X	X	
Mammals	<i>Enhydra lutris nereis</i>	Otter, Southern sea	T						X
Mammals	<i>Eumops perotis californicus</i>	Greater western mastiff-bat	SC	X					
Mammals	<i>Felis concolor browni</i>	Yuma puma	SC	X					
Mammals	<i>Lepus californicus bennettii</i>	San Diego black-tailed jackrabbit	SC	X					
Mammals	<i>Macrotus californicus</i>	California leaf-nosed bat	SC	X					
Mammals	<i>Microtus californicus scirpensis</i>	Vole, Amargosa	E					X	
Mammals	<i>Microtus californicus stephensi</i>	Stephens' California vole (=meadow mouse)	SC	X					
Mammals	<i>Myotis evotis</i>	Long-eared myotis (bat)	SC	X					
Mammals	<i>Myotis lucifugus occultus</i>	Occult little brown bat	SC	X					
Mammals	<i>Myotis thysanodes</i>	Fringed myotis (bat)	SC	X					
Mammals	<i>Myotis volans</i>	Long-legged myotis (bat)	SC	X					
Mammals	<i>Myotis yumanensis</i>	Yuma myotis (bat)	SC	X					
Mammals	<i>Neotoma lepida intermedia</i>	San Diego desert woodrat	SC	X					
Mammals	<i>Nyctinomops macrotis</i>	Big free-tailed bat	SC	X					
Mammals	<i>Perognathus californicus femoralis</i>	Dulzura California pocket mouse	SC	X					
Mammals	<i>Perognathus longimembris pacificus</i>	Mouse, Pacific pocket	E				X	X	X
Mammals	<i>Peromyscus eremicus papagensis</i>	Pinacate cactus mouse	SC	X					
Mammals	<i>Peromyscus eremicus pullus</i>	Black Mountain cactus mouse	SC	X					
Mammals	<i>Peromyscus maniculatus clementis</i>	San Clemente deer mouse	SC	X					
Mammals	<i>Phoca vitulina</i>	Seal, Harbor	MMPA	X					
Mammals	<i>Sorex ornatus</i>	Shrew, Ornate	SC	X					
Mammals	<i>Sylvilagus bachmani riparius</i>	Riparian brush rabbit	C	X					
Mammals	<i>Vulpes macrotis mutica</i>	Fox, San Joaquin kit	E					X	

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				FES	FWS	Other	GS 32K	GS 100K	
Mammals	<i>Zalophus californicus</i>	Sealion, Colifornia	MMPA	X					
Plants	<i>Allium munzii</i>	Onion, Munz's	PE				X	X	
Plants	<i>Arenaria paludicola</i>	Marsh sandwort	E					X	
Plants	<i>Astragalus albens</i>	Cushenbury milk-vetch	E					X	
Plants	<i>Astragalus jaegerianus</i>	Milk-vetch, Coolgardie	PE					X	
Plants	<i>Astragalus lentiginosus coachellae</i>	Milk-vetch, Coachella Valley	PE				X	X	
Plants	<i>Astragalus tener titi</i>	Rattleweed, coastal dunes	PE						X
Plants	<i>Astragalus tricarinatus</i>	Milk-vetch, triple-ribbed	PE				X	X	
Plants	<i>Baccharis vanessae</i>	Baccharis (=Coyote bush), Encinitis	E				X	X	X
Plants	<i>Brodiaea filifolia</i>	Brodiaea, thread-leaved	PT				X	X	X
Plants	<i>Castilleja grisea</i>	San Clemente Island Indian paintbrush	E					X	
Plants	<i>Centrostegia leptoceras</i>	Slender-horned spineflower	E				X	X	
Plants	<i>Chorizanthe orcuttiana</i>	Spineflower, Orcutt's	E				X	X	
Plants	<i>Cordylanthus maritimus maritimus</i>	Salt marsh bird's-beak	E				X	X	X
Plants	<i>Corethrogyne filaginifolia linifolia</i>	Sand aster, Del Mar	SC	X			X	X	
Plants	<i>Delphinium variegatum kinkiense</i>	San Clemente Island larkspur	E					X	
Plants	<i>Downingia concolor brevior</i>	Downingia, Cuyamaca Lake	SC				X	X	
Plants	<i>Dudleya blochmaniae brevifolia</i>	Dudleya, short-leaved	SC				X	X	
Plants	<i>Dudleya setchellii</i>	Santa Clara Valley dudleya	E				X	X	
Plants	<i>Eriastrum densifolium sanctorum</i>	Santa Ana River woolly-star	E				X	X	
Plants	<i>Erigeron parishii</i>	Parish's daisy	T				X	X	
Plants	<i>Eriogonum ovalifolium vineum</i>	Cushenbury buckwheat	E					X	
Plants	<i>Eryngium aristulatum parishii</i>	San Diego button-celery	E				X	X	X
Plants	<i>Lesquerella kingii bernardina</i>	San Bernardino Mountains bladderpod	E					X	
Plants	<i>Limnanthes gracilis parishii</i>	Meadowfoam, Parish's	SC				X	X	
Plants	<i>Lotus dendroideus traskiae</i>	San Clemente Island broom	E					X	

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				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Malacothamnus clementinus</i>	San Clemente Island bush-mallow	E					X	
Plants	<i>Navarretia fossalis</i>	Navarretia, prostrate (=no-named)	PT				X	X	X
Plants	<i>Orcuttia californica</i>	California Orcutt grass	E				X	X	X
Plants	<i>Oxytheca parishii goodmaniana</i>	Cushenbury oxytheca	E					X	
Plants	<i>Pogogyne abramsii</i>	San Diego mesa mint	E				X	X	
Plants	<i>Pogogyne nudiuscula</i>	Otay mesa mint	E				X	X	
Plants	<i>Puccinellia parishii</i>	Alkali grass, Parish's	PE					X	
Plants	<i>Rorippa gambellii</i>	Gambel's watercress	E				X	X	X
Plants	<i>Sidalcea pedata</i>	Pedate checker-mallow	E					X	
Plants	<i>Suaeda californica</i>	Seablite, California	E	X					
Plants	<i>Thelypodium stenopetalum</i>	Slender-petaled mustard	E					X	
Plants	<i>Verbesina dissita</i>	Crownbeard, big-leaved	T				X	X	
Reptiles	<i>Anniella pulchra pulchra</i>	Silvery legless lizard	SC	X					
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T	X					
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T				X	X	
Reptiles	<i>Clemmys marmorata pallida</i>	Southwestern pond turtle	SC	X					
Reptiles	<i>Coleonyx variegatus abbotti</i>	San Diego banded gecko	SC	X					
Reptiles	<i>Crotalus ruber ruber</i>	Northern red diamond rattlesnake	SC	X					
Reptiles	<i>Eumeces skiltonianus interparietalis</i>	Coronado skink	SC	X					
Reptiles	<i>Gambelia silus</i>	Lizard, blunt-nosed leopard	E					X	
Reptiles	<i>Gopherus agassizii</i>	Tortoise, desert	E				X	X	
Reptiles	<i>Lepidochelys olivacea</i>	Turtle, olive (=Pacific) ridley sea	E				X	X	
Reptiles	<i>Phrynosoma coronatum blainvillii</i>	San Diego horned lizard	SC	X					
Reptiles	<i>Phrynosoma mcallii</i>	Flat-tailed horned lizard	PT				X	X	
Reptiles	<i>Salvadora hexalepis virgultea</i>	Coast patch-nosed snake	SC	X					
Reptiles	<i>Uma inornata</i>	Lizard, Coachella Valley fringe-toed	T				X	X	

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# San Onofre

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Reptiles	<i>Xantusia riversiana</i>	Lizard, Island night	T					X	

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# Seabrook

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E		X			X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T		X		X	X	
Birds	<i>Sterna dougallii dougallii</i>	Tern, roseate	E,T					X	
Clams	<i>Alasmidonta heterodon</i>	Mussel, dwarf wedge	E					X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E		X		X	X	X
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E					X	
Mammals	<i>Balaenoptera physalus</i>	Whale, Fin	E						X
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Megaptera novaeangliae</i>	Whale, Humpback	E						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E					X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E					X	
Plants	<i>Astragalus robbinsii jesupi</i>	Jesup's milk-vetch	E					X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T		X		X	X	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T				X	X	
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T					X	
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E		X				X
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E				X	X	

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# Sequoyah

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Gyrinophilus palleucus</i>	Tennessee cave salamander	SC						X
Birds	<i>Aimophila aestivalis</i>	Bachman's sparrow	SC						X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Mycteria americana</i>	Stork, wood	E					X	
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E	X			X	X	
Clams	<i>Alasmidonta atropurpurea</i>	Cumberland elktoe (mussel)	E					X	
Clams	<i>Alasmidonta raveneliana</i>	Elktoe, Appalachian	E					X	
Clams	<i>Cyprogenia stegaria</i>	Fanshell	E				X	X	
Clams	<i>Dromus dromas</i>	Pearlymussel, dromedary	E				X	X	
Clams	<i>Epioblasma florentina florentina</i>	Pearlymussel, yellow-blossom	E					X	
Clams	<i>Epioblasma metastriata</i>	Combshell, upland	E				X	X	
Clams	<i>Epioblasma othcaloogensis</i>	Acornshell, southern	E				X	X	
Clams	<i>Fusconaia cuneolus</i>	Pigtoe, fine-rayed	E				X	X	
Clams	<i>Fusconaia edgariana</i>	Pigtoe, shiny	E					X	
Clams	<i>Lampsilis altilis</i>	Pocketbook, fine-lined	T				X	X	
Clams	<i>Lampsilis orbiculata</i>	Pearlymussel, pink mucket	E				X	X	
Clams	<i>Lampsilis virescens</i>	Lampmussel, Alabama (=Pearlymussel,	E				X	X	
Clams	<i>Medionidus acutissimus</i>	Moccasinshell, Alabama	T				X	X	
Clams	<i>Medionidus parvulus</i>	Moccasinshell, Coosa	E				X	X	
Clams	<i>Pegias fabula</i>	Pearlymussel, little-wing	E					X	
Clams	<i>Plethobasus cooperianus</i>	Pearlymussel, orange-foot pimpleback	E					X	
Clams	<i>Pleurobema decisum</i>	Clubshell, southern	E				X	X	
Clams	<i>Pleurobema georgianum</i>	Pigtoe, southern	E				X	X	
Clams	<i>Pleurobema gibberum</i>	Pigtoe, Cumberland (=Cumberland pigtoe	E					X	
Clams	<i>Pleurobema perovatum</i>	Clubshell, ovate	E				X	X	

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# Sequoyah

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Clams	<i>Pleurobema plenum</i>	Pigtoe, rough	E				X	X	
Clams	<i>Ptychobranhus greeni</i>	Kidneyshell, triangular	E				X	X	
Clams	<i>Quadrula intermedia</i>	Pearlymussel, Cumberland monkeyface	E					X	
Clams	<i>Toxolasma cylindrellus</i>	Pearlymussel, pale lilliput	E					X	
Clams	<i>Villosa perpurpurea</i>	Purple bean (=Fine-rayed purple	E					X	
Clams	<i>Villosa trabalis</i>	Pearlymussel, Cumberland bean	E					X	
Crustaceans	<i>Cambarus extraneus</i>	Chickamauga crayfish	SC						X
Fishes	<i>Acipenser fulvescens</i>	Lake sturgeon	SC	X					
Fishes	<i>Cyprinella caerulea</i>	Shiner, blue	T				X	X	
Fishes	<i>Etheostoma etowahae</i>	Darter, Etowah	E					X	
Fishes	<i>Etheostoma sp. (Cherokee)</i>	Darter, Cherokee	T					X	
Fishes	<i>Etheostoma sp. (Duskytail)</i>	Darter, duskytail	E					X	
Fishes	<i>Hybopsis monacha</i>	Chub, spotfin (=turquoise shiner)	T				X	X	
Fishes	<i>Noturus baileyi</i>	Madtom, smoky	E					X	
Fishes	<i>Noturus flavipinnis</i>	Madtom, yellowfin	T				X	X	
Fishes	<i>Percina antesella</i>	Darter, amber	E				X	X	
Fishes	<i>Percina aurolineata</i>	Darter, goldline	T				X	X	
Fishes	<i>Percina jenkinsi</i>	Logperch, Conasauga	E				X	X	
Fishes	<i>Percina tanasi</i>	Darter, snail	T				X	X	
Fishes	<i>Polyodon spathula</i>	Paddlefish	SC	X					
Mammals	<i>Canis rufus</i>	Wolf, red	E					X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E				X	X	
Mammals	<i>Glaucomys sabrinus coloratus</i>	Squirrel, Carolina northern flying	E					X	
Mammals	<i>Myotis grisescens</i>	Bat, gray	E				X	X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Mammals	<i>Neotoma floridana magister</i>	Alleghany (=Eastern) woodrat	SC						X

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# Sequoyah

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				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Apios priceana</i>	Price's potato-bean	T				X	X	
Plants	<i>Arenaria cumberlandensis</i>	Cumberland sandwort	E					X	
Plants	<i>Aureolaria patula</i>	Foxglove, False	SC						X
Plants	<i>Clematis socialis</i>	Alabama leather-flower	E					X	
Plants	<i>Conradina verticillata</i>	Cumberland rosemary	T					X	
Plants	<i>Delphinium exaltatum</i>	Larkspur, tall	SC						X
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	X
Plants	<i>Lysimachia fraseri</i>	Loosestrife,	SC						X
Plants	<i>Marshallia mohrii</i>	Mohr's Barbara's buttons	T				X	X	
Plants	<i>Phyllitis scolopendrium americana</i>	Fern, American Hart's-tongue	T					X	
Plants	<i>Pityopsis ruthii</i>	Ruth's golden aster	E					X	
Plants	<i>Ptilimnium nodosum</i>	Harperella	E					X	
Plants	<i>Sagittaria secundifolia</i>	Kral's water-plantain	T					X	
Plants	<i>Sarracenia oreophila</i>	Green pitcher-plant	E					X	
Plants	<i>Scutellaria montana</i>	Large-flowered skullcap	E				X	X	X
Plants	<i>Spiraea virginiana</i>	Virginia spiraea	T				X	X	
Plants	<i>Xyris tennesseensis</i>	Tennessee yellow-eyed grass	E				X	X	
Snails	<i>Anguispira picta</i>	Snail, painted snake coiled forest	T					X	
Snails	<i>Athearnia anthonyi</i>	Riversnail, Anthony's	E				X	X	
Snails	<i>Marstonia ogmoraphe</i>	Marstonia (snail, royal (=obese))	E				X	X	

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# Shoreham

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	
Birds	<i>Sterna dougallii dougallii</i>	Tern, roseate	E,T				X	X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E					X	X
Insects	<i>Cicindela puritana</i>	Beetle, Puritan tiger	T					X	
Insects	<i>Nicrophorus americanus</i>	Beetle, American burying (=giant carrion)	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E				X	X	
Plants	<i>Amaranthus pumilus</i>	Seabeach amaranth	T	X			X	X	
Plants	<i>Bidens bidentoides bidentoides</i>	Bur-marigold,	SC	X					
Plants	<i>Desmodium humifusum</i>	Tick-trefoil, ground-spreading	SC	X					
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T				X	X	X
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T				X	X	X
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E						X
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E				X	X	X

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# South Texas

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Bufo houstonensis</i>	Toad, Houston	E					X	X
Amphibians	<i>Eurycea neotenes</i>	Texas salamander	SC						X
Amphibians	<i>Eurycea tridentifera</i>	Comal blind salamander	SC						X
Amphibians	<i>Notophthalmus meridionalis</i>	Black-spotted newt	SC						X
Amphibians	<i>Siren intermedia texana</i>	Rio Grande lesser siren	SC						X
Arachnids	<i>Cicurina baroni</i>	Robber Baron Cave spider	SC						X
Arachnids	<i>Cicurina madla</i>	Madla's cave spider	SC						X
Arachnids	<i>Cicurina venii</i>	Veni's cave spider	SC						X
Arachnids	<i>Cicurina vespera</i>	Vesper cave spider	SC						X
Arachnids	<i>Neoleptoneta microps</i>	Government Canyon cave spider	SC						X
Arachnids	<i>Texella cokendolpheri</i>	Robber Baron Cave harvestman	SC						X
Birds	<i>Aimophila aestivalis</i>	Bachman's sparrow	SC	X					
Birds	<i>Aimophila botteri texana</i>	Texas Botteri's sparrow	SC						X
Birds	<i>Ammodramus henslowii</i>	Sparrow, Henslow's	SC						X
Birds	<i>Arremonops rufivirgatus rufivirgatus</i>	Texas (=Sennett's) olive sparrow	SC	X					X
Birds	<i>Athene cunicularia hypugea</i>	Western burrowing owl	SC	X					
Birds	<i>Buteo nitidus maximus</i>	Northern gray hawk	SC						X
Birds	<i>Buteo regalis</i>	Ferruginous hawk	SC						X
Birds	<i>Charadrius alexandrinus nivosus</i>	Plover, western snowy	T						X
Birds	<i>Charadrius alexandrinus tenuirostris</i>	Southeastern snowy plover	SC						X
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	X
Birds	<i>Charadrius montanus</i>	Mountain plover	C						X
Birds	<i>Chlidonias niger</i>	Black tern	SC	X					X
Birds	<i>Dendroica chrysoparia</i>	Warbler, golden-cheeked	E						X
Birds	<i>Egretta rufescens</i>	Reddish egret	SC						X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	X

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# South Texas

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Geothlypis trichas insperata</i>	Brownsville common yellowthroat	SC	X					
Birds	<i>Grus americana</i>	Crane, whooping	E		X		X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X	X		X	X	X
Birds	<i>Icterus cucullatus cucullatus</i>	Mexican hooded oriole	SC						X
Birds	<i>Icterus cucullatus sennetti</i>	Sennett's hooded oriole	SC						X
Birds	<i>Icterus graduacauda audubonii</i>	Audubon's oriole	SC						X
Birds	<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike	SC						X
Birds	<i>Laterallus jamaicensis</i>	Black rail	SC						X
Birds	<i>Numenius borealis</i>	Curlew, Eskimo	E					X	
Birds	<i>Pelecanus occidentalis</i>	Pelican, brown	E	X	X		X	X	X
Birds	<i>Plegadis chihi</i>	White-faced ibis	SC	X					X
Birds	<i>Tympanuchus cupido attwateri</i>	Prairie-chicken, Attwater's greater	E		X			X	X
Birds	<i>Vireo atricapillus</i>	Vireo, black-capped	E						X
Crustaceans	<i>Stygobromus pecki</i>	Peck's cave amphipod	PE						X
Fishes	<i>Cycleptus elongatus</i>	Blue sucker	SC	X					
Fishes	<i>Etheostoma fonticola</i>	Darter, fountain	E						X
Fishes	<i>Micropterus treculi</i>	Guadalupe bass	SC						X
Fishes	<i>Satan eurystomus</i>	Widemouth blindcat	SC						X
Insects	<i>Batrissodes ventyivi</i>	Helotes mold beetle	SC						X
Insects	<i>Heterelmis comalensis</i>	Comal Springs riffle beetle	PE						X
Insects	<i>Rhadine exilis</i>	Ground beetle, no common name	SC						X
Insects	<i>Rhadine infernalis</i>	Ground beetle, no common name	SC						X
Insects	<i>Stygoparnus comalensis</i>	Comal Springs dryopid beetle	PE						X
Mammals	<i>Blarina hylophaga plumbea</i>	Aransas short-tailed shrew	SC						X
Mammals	<i>Conepatus leuconotus texensis</i>	Gulf Coast hog-nosed skunk	C	X					X
Mammals	<i>Felis pardalis</i>	Ocelot	E					X	X

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# South Texas

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Mammals	<i>Felis yagouaroundi tolteca</i>	Jaguarundi	E		X			X	X
Mammals	<i>Geomys personatus maritimus</i>	Maritime Texas pocket gopher	SC	X					X
Mammals	<i>Geomys personatus streckeri</i>	Carrizo Springs Texas pocket gopher	SC	X					
Mammals	<i>Myotis velifer</i>	Cave myotis (bat)	SC	X					
Mammals	<i>Scalopus aquaticus texanus</i>	Presidio mole	SC	X					
Mammals	<i>Spilogale putorius interrupta</i>	Plains spotted skunk	SC	X					X
Mammals	<i>Trichechus manatus</i>	Manatee, West Indian (=Florida)	E						X
Mammals	<i>Ursus americanus luteolus</i>	Bear, Louisiana black	T					X	
Plants	<i>Ambrosia cheiranthifolia</i>	South Texas ambrosia	E						X
Plants	<i>Anthericum chandleri</i>	Lilia de los llanos	SC						X
Plants	<i>Argythamnia aphoroides</i>	Mercury, wild, Hill Country	SC						X
Plants	<i>Boerhavia mathisiana</i>	Spiderling, Mathis	SC						X
Plants	<i>Chloris texensis</i>	Grass, Texas windmill	SC	X					X
Plants	<i>Colubrina stricta</i>	Snakewood, Comal	SC						X
Plants	<i>Cuscuta attenuata</i>	Dodder, slender	SC						X
Plants	<i>Cyperus grayoides</i>	Sedge, umbrella,	SC						X
Plants	<i>Echinocereus reichenbachii albertii</i>	Black lace cactus	E					X	X
Plants	<i>Hexalectris nitida</i>	Coral-root, Glass Mountain	SC						X
Plants	<i>Hoffmannseggia tenella</i>	Slender rush-pea	E	X					X
Plants	<i>Hymenoxys texana</i>	Texas prairie dawn-flower (=Texas	E					X	
Plants	<i>Justicia runyonii</i>	Water-willow, Runyon's	SC						X
Plants	<i>Machaeranthera heterocarpa</i>	Machearanthera, Welder	SC						X
Plants	<i>Philadelphus ernestii</i>	Mock orange, canyon	SC						X
Plants	<i>Physostegia correllii</i>	False dragon-head, Correll's	SC						X
Plants	<i>Salvia penstemonoides</i>	Sage, big red	SC						X
Plants	<i>Streptanthus bracteatus</i>	Twistflower, bracted	SC						X

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# South Texas

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T				X	X	X
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T				X	X	X
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E				X	X	X
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E				X	X	X
Reptiles	<i>Graptemys caglei</i>	Cagle's map turtle	C					X	X
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E				X	X	X
Reptiles	<i>Malaclemys terrapin littoralis</i>	Texas diamondback terrapin	SC	X					X
Reptiles	<i>Nerodia clarkii</i>	Snake, Gulf salt marsh	SC	X					X
Reptiles	<i>Phrynosoma cornutum</i>	Texas horned lizard	SC	X					X
Reptiles	<i>Thamnophis sirtalis annectens</i>	Texas garter snake	SC	X					X

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# St. Lucie

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Ammodramus savannarum floridanus</i>	Sparrow, Florida grasshopper	E					X	
Birds	<i>Aphelocoma coerulescens coerulescens</i>	Jay, Florida scrub	T				X	X	X
Birds	<i>Campephilus principalis</i>	Woodpecker, ivory-billed	E						X
Birds	<i>Caracara cheriway audubonii</i>	Caracara, Audobon's crested	T				X	X	X
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	X
Birds	<i>Dendroica kirtlandii</i>	Warbler, Kirtland's	E						X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X					
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X	X		X	X	X
Birds	<i>Mycteria americana</i>	Stork, wood	E				X	X	X
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E				X	X	X
Birds	<i>Rostrhamus sociabilis plumbeus</i>	Kite, Everglade snail	E				X	X	X
Birds	<i>Sterna dougallii dougallii</i>	Tern, roseate	E,T						X
Birds	<i>Vermivora bachmanii</i>	Warbler, Bachman's	E						X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E						X
Fishes	<i>Acipenser oxyrhynchus desotoi</i>	Sturgeon, Gulf	T					X	
Mammals	<i>Felis concolor coryi</i>	Panther, Florida	E	X				X	
Mammals	<i>Peromyscus polionotus leucocephalus</i>	Santa Rosa beach mouse	SC	X					
Mammals	<i>Peromyscus polionotus niveiventris</i>	Mouse, southeastern beach	T				X	X	X
Mammals	<i>Peromyscus polionotus peninsularis</i>	St. Andrews beach mouse	C	X					
Mammals	<i>Trichechus manatus</i>	Manatee, West Indian (=Florida)	E	X	X		X	X	X
Mammals	<i>Ursus americanus floridanus</i>	Florida black bear	C						X
Plants	<i>Asimina tetramera</i>	Four-petal pawpaw	E				X	X	X
Plants	<i>Bonamia grandiflora</i>	Florida bonamia	T					X	
Plants	<i>Cereus eriophorus fragrans</i>	Fragrant prickly-apple	E				X	X	X
Plants	<i>Chionanthus pygmaeus</i>	Pygmy fringe-tree	E					X	
Plants	<i>Cladonia perforata</i>	Florida perforate cladonia	E					X	

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# St. Lucie

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Conradina brevifolia</i>	Short-leaved rosemary	E					X	
Plants	<i>Crotalaria avonensis</i>	Avon Park harebells	E					X	
Plants	<i>Cucurbita okeechobeensis</i>	Okeechobee gourd	E					X	
Plants	<i>Dicerandra christmanii</i>	Garrett's mint	E					X	
Plants	<i>Dicerandra frutescens</i>	Scrub mint	E					X	X
Plants	<i>Dicerandra immaculata</i>	Lakela's mint	E				X	X	X
Plants	<i>Eriogonum longifolium gnaphalifolium</i>	Scrub buckwheat	T					X	
Plants	<i>Eryngium cuneifolium</i>	Snakeroot	E					X	
Plants	<i>Halophila johnsonii</i>	Seagrass, Johnsons	PT						X
Plants	<i>Hypericum cumulicola</i>	Highlands scrub hypericum	E					X	
Plants	<i>Jacquemontia reclinata</i>	Beach jacquemontia	E					X	
Plants	<i>Liatris ohlingerae</i>	Scrub blazingstar	E					X	
Plants	<i>Lupinus aridorum</i>	Scrub lupine	E					X	
Plants	<i>Nolina brittoniana</i>	Britton's beargrass	E					X	
Plants	<i>Paronychia chartacea</i>	Papery whitlow-wort	T					X	
Plants	<i>Polygala lewtonii</i>	Lewton's polygala	E					X	
Plants	<i>Polygonella basiramia</i>	Wireweed	E					X	
Plants	<i>Prunus geniculata</i>	Scrub plum	E					X	
Plants	<i>Warea amplexifolia</i>	Wide-leaf warea	E					X	
Plants	<i>Warea carteri</i>	Carter's mustard	E					X	
Plants	<i>Ziziphus celata</i>	Florida ziziphus	E					X	
Reptiles	<i>Alligator mississippiensis</i>	Alligator, American	T/SA						X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T	X	X		X	X	X
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T	X	X		X	X	X
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E	X	X		X	X	X
Reptiles	<i>Drymarchon corais couperi</i>	Snake, eastern indigo	T				X	X	X

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# St. Lucie

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E	X			X	X	X
Reptiles	<i>Eumeces egregius lividus</i>	Skink, bluetail (=blue-tailed mole	T					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E		X		X	X	X
Reptiles	<i>Neoseps reynoldsi</i>	Skink, sand	T					X	
Reptiles	<i>Nerodia fasciata taeniata</i>	Snake, Atlantic salt marsh	T				X	X	

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St. Lucie

E - 99

# Summer

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X				X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike	SC	X				X	X
Birds	<i>Mycteria americana</i>	Stork, wood	E					X	
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E				X	X	
Clams	<i>Lasmigona decorata</i>	Heelsplitter, Carolina	E					X	
Crustaceans	<i>Distocambarus youngineri</i>	Saluda crayfish	SC						X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E					X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E					X	
Plants	<i>Amphianthus pusillus</i>	Little amphianthus	T				X	X	
Plants	<i>Aster georgianus</i>	Aster, Georgia	SC						X
Plants	<i>Echinacea laevigata</i>	Smooth coneflower	E				X	X	
Plants	<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E				X	X	
Plants	<i>Helonias bullata</i>	Swamp pink	T					X	
Plants	<i>Hexastylis naniflora</i>	Dwarf-flowered heartleaf	T					X	
Plants	<i>Isoetes melanospora</i>	Black-spored quillwort	E					X	
Plants	<i>Lotus purshianus helleri</i>	Trefoil, Heller's	SC						X
Plants	<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E				X	X	
Plants	<i>Oxypolis canbyi</i>	Canby's dropwort	E				X	X	
Plants	<i>Ptilimnium nodosum</i>	Harperella	E				X	X	
Plants	<i>Rhus michauxii</i>	Michaux's sumac	E				X	X	
Plants	<i>Ribes echinellum</i>	Miccosukee gooseberry	T					X	
Plants	<i>Sagittaria fasciculata</i>	Bunched arrowhead	E					X	
Plants	<i>Sarracenia rubra jonesii</i>	Mountain sweet pitcher-plant	E					X	
Plants	<i>Schwalbea americana</i>	American chaffseed	E					X	

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# Summer

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Sisyrinchium dichotomum</i>	White irisette	E					X	
Plants	<i>Trillium reliquum</i>	Relict trillium	E					X	

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# Surry

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T	X			X	X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X		X	X	X	X
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E				X	X	
Clams	<i>Alasmidonta heterodon</i>	Mussel, dwarf wedge	E					X	
Clams	<i>Pleurobema collina</i>	Spiny mussel, James River (=Virginia)	E					X	
Crustaceans	<i>Stygobromus araeus</i>	Tidewater interstitial amphipod	SC						X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E					X	
Fishes	<i>Percina rex</i>	Logperch, Roanoke	E				X	X	
Insects	<i>Cicindela dorsalis dorsalis</i>	Beetle, northeastern beach tiger	T				X	X	
Insects	<i>Speyeria diana</i>	Diana fritillary (butterfly)	SC						X
Mammals	<i>Canis rufus</i>	Wolf, red	E					X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E					X	
Mammals	<i>Sciurus niger cinereus</i>	Squirrel, Delmarva Peninsula fox	E					X	
Mammals	<i>Sorex longirostris fisheri</i>	Shrew, Dismal Swamp southeastern	T				X	X	
Plants	<i>Aeschynomene virginica</i>	Sensitive joint-vetch	T			X	X	X	X
Plants	<i>Amaranthus pumilus</i>	Seabeach amaranth	T					X	
Plants	<i>Cassia fasciculata macrosperma</i>	Senna, Marsh	SC			X			X
Plants	<i>Echinacea laevigata</i>	Smooth coneflower	E					X	
Plants	<i>Helonias bullata</i>	Swamp pink	T					X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	
Plants	<i>Juglans cinerea</i>	Butternut	SC						X
Plants	<i>Schwalbea americana</i>	American chaffseed	E				X	X	
Plants	<i>Trillium pusillum virginianum</i>	Trillium, Virginia least	SC			X			X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T	X			X	X	
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T	X				X	

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# Surry

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E	X				X	
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E	X					
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E	X			X	X	
Reptiles	<i>Malaclemys terrapin terrapin</i>	Northern diamondback terrapin	SC	X					

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Surry

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# Susquehanna

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X				X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X				X	X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E					X	
Insects	<i>Papaipema sp.</i>	Flypoison borer moth	SC						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	X
Plants	<i>Carex polymorpha</i>	Sedge, variable	SC						X
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	
Plants	<i>Scirpus ancistrochaetus</i>	Northeastern (=Barbed bristle) bulrush	E					X	X

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# Three Mile Island

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Chlidonias niger</i>	Black tern	SC			X			
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X		X	X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X		X	X	X	X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E					X	
Fishes	<i>Etheostoma sellare</i>	Darter, Maryland	E					X	
Insects	<i>Cicindela puritana</i>	Beetle, Puritan tiger	T					X	
Insects	<i>Phyciodes batesi</i>	Tawny crescent butterfly	SC						X
Insects	<i>Speyeria idalia</i>	Regal fritillary (butterfly)	SC						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E			X	X	X	
Mammals	<i>Sciurus niger cinereus</i>	Squirrel, Delmarva Peninsula fox	E					X	
Plants	<i>Agalinis acuta</i>	Sandplain gerardia	E					X	
Plants	<i>Helonias bullata</i>	Swamp pink	T					X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T					X	
Plants	<i>Scirpus ancistrochaetus</i>	Northeastern (=Barbed bristle) bulrush	E				X	X	X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T					X	
Reptiles	<i>Clemmys muhlenbergii</i>	Bog turtle	PT/PTs	X		X			X

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# Trojan

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Rana aurora aurora</i>	Northern red-legged frog	SC	X	X				X
Amphibians	<i>Rana pretiosa</i>	Spotted frog	C	X					
Birds	<i>Agelaius tricolor</i>	Tricolored blackbird	SC		X				X
Birds	<i>Brachyramphus marmoratus marmoratus</i>	Murrelet, marbled	T				X	X	
Birds	<i>Branta canadensis leucopareia</i>	Goose, Aleutian Canada	T		X			X	X
Birds	<i>Charadrius alexandrinus nivosus</i>	Plover, western snowy	T					X	
Birds	<i>Empidonax traillii brewsteri</i>	Little willow flycatcher	SC		X				X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E		X		X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X	X		X	X	X
Birds	<i>Pelecanus occidentalis</i>	Pelican, brown	E				X	X	
Birds	<i>Strix occidentalis caurina</i>	Owl, northern spotted	T				X	X	X
Fishes	<i>Acipenser medirostris</i>	Green sturgeon	SC		X				X
Fishes	<i>Lampetra ayresi</i>	River Lamprey	SC		X				X
Fishes	<i>Lampetra tridentata</i>	Pacific lamprey	SC	X	X				X
Fishes	<i>Oncorhynchus kisutch</i>	Salmon, Coho	E						X
Fishes	<i>Oncorhynchus nerka</i>	Salmon, sockeye (=red, =blueback)	E	X	X		X	X	X
Fishes	<i>Oncorhynchus tshawytscha</i>	Salmon, chinook	E,T	X	X				X
Fishes	<i>Oregonichthys crameri</i>	Chub, Oregon	E					X	
Insects	<i>Speyeria zerene hippolyta</i>	Butterfly, Oregon silverspot	T					X	
Mammals	<i>Arborimus albipes</i>	White-footed vole	SC		X				X
Mammals	<i>Canis lupus</i>	Wolf, gray	E,T				X	X	
Mammals	<i>Felis lynx canadensis</i>	North American lynx	SC	X					
Mammals	<i>Martes pennanti pacifica</i>	Pacific fisher	SC	X					X
Mammals	<i>Myotis evotis</i>	Long-eared myotis (bat)	SC	X	X				X
Mammals	<i>Myotis thysanodes</i>	Fringed myotis (bat)	SC		X				X
Mammals	<i>Myotis volans</i>	Long-legged myotis (bat)	SC		X				X

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# Trojan

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Mammals	<i>Myotis yumanensis</i>	Yuma myotis (bat)	SC	X					X
Mammals	<i>Odocoileus virginianus leucurus</i>	Deer, Columbian white-tailed	E		X		X	X	X
Mammals	<i>Plecotus townsendii townsendii</i>	Pacific Townsend's big-eared bat	SC	X	X				X
Mammals	<i>Ursus arctos</i>	Bear, grizzly (=brown)	T					X	
Plants	<i>Aster curtus</i>	Aster, curtus	SC						X
Plants	<i>Castilleja levisecta</i>	Indian Paintbrush	PT					X	
Plants	<i>Cimicifuga elata</i>	Bugbane, tall	SC		X				X
Plants	<i>Howellia aquatilis</i>	Howellia, water	T		X		X	X	X
Plants	<i>Lomatium bradshawii</i>	Bradshaw's desert-parsley (=lomatium)	E		X			X	X
Plants	<i>Montia howellii</i>	Montia Howell's	SC		X				X
Plants	<i>Rorippa columbiae</i>	Yellow-cress, Columbia	SC						X
Plants	<i>Sidalcea nelsoniana</i>	Nelson's checker-mallow	T				X	X	
Plants	<i>Sullivantia oregana</i>	Sullivantia	SC						X
Reptiles	<i>Clemmys marmorata marmorata</i>	Northwestern pond turtle	SC		X				X
Snails	<i>Fluminicola columbianus</i>	Columbia pebblesnail (=Great Columbia River	SC		X				X

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Trojan

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# Turkey Point

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Ammodramus maritimus mirabilis</i>	Sparrow, Cape Sable seaside	E				X	X	X
Birds	<i>Ammodramus savannarum floridanus</i>	Sparrow, Florida grasshopper	E				X	X	
Birds	<i>Aphelocoma coerulescens coerulescens</i>	Jay, Florida scrub	T					X	
Birds	<i>Campephilus principalis</i>	Woodpecker, ivory-billed	E						X
Birds	<i>Caracara cheriway audubonii</i>	Caracara, Audobon's crested	T				X	X	X
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	X
Birds	<i>Columba leucocephala</i>	Pigeon, White-crowned	SC			X			
Birds	<i>Egretta rufescens</i>	Reddish egret	SC	X					
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E		X				
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X	X		X	X	X
Birds	<i>Mycteria americana</i>	Stork, wood	E	X			X	X	X
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E				X	X	
Birds	<i>Rostrhamus sociabilis plumbeus</i>	Kite, Everglade snail	E				X	X	X
Birds	<i>Sterna antillarum</i>	Tern, least	E			X			
Birds	<i>Sterna dougallii dougallii</i>	Tern, roseate	E,T				X	X	X
Birds	<i>Vermivora bachmanii</i>	Warbler, Bachman's	E						X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E						X
Insects	<i>Heracles aristodemus ponceanus</i>	Butterfly, Schaus swallowtail	E				X	X	
Mammals	<i>Blarina brevicauda shermani</i>	Sherman's short-tailed shrew	SC	X					
Mammals	<i>Eumops glaucinus floridanus</i>	Florida mastiff-bat	SC?						X
Mammals	<i>Felis concolor coryi</i>	Panther, Florida	E	X			X	X	X
Mammals	<i>Mustela frenata peninsulæ</i>	Florida long-tailed weasel	SC	X					
Mammals	<i>Neofiber alleni</i>	Round-tailed muskrat	SC	X					
Mammals	<i>Neotoma floridana smalli</i>	Woodrat, Key Largo	E				X	X	
Mammals	<i>Odocoileus virginianus clavium</i>	Deer, key	E				X	X	X
Mammals	<i>Oryzomys palustris natator</i>	Rice rat (=silver rice rat)	E				X	X	

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# Turkey Point

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Mammals	<i>Peromyscus floridanus</i>	Florida mouse	SC	X					
Mammals	<i>Peromyscus gossypinus allapaticola</i>	Mouse, Key Largo cotton	E				X	X	
Mammals	<i>Sciurus niger shermani</i>	Sherman's fox squirrel	SC	X					
Mammals	<i>Sylvilagus palustris hefneri</i>	Rabbit, Lower Keys	E				X	X	
Mammals	<i>Trichechus manatus</i>	Manatee, West Indian (=Florida)	E	X	X		X	X	X
Mammals	<i>Ursus americanus floridanus</i>	Florida black bear	C						X
Plants	<i>Amorpha crenulata</i>	Crenulate lead-plant	E				X	X	X
Plants	<i>Cereus robinii</i>	Key tree-cactus	E				X	X	
Plants	<i>Eryngium cuneifolium</i>	Snakeroot	E					X	
Plants	<i>Euphorbia deltoidea deltoidea</i>	Deltoid spurge	E				X	X	X
Plants	<i>Euphorbia garberi</i>	Garber's spurge	T				X	X	X
Plants	<i>Galactia smallii</i>	Small's milkpea	E				X	X	X
Plants	<i>Halophila johnsonii</i>	Seagrass, Johnsons	PT						X
Plants	<i>Jacquemontia reclinata</i>	Beach jacquemontia	E				X	X	X
Plants	<i>Polygala smallii</i>	Tiny polygala	E				X	X	X
Reptiles	<i>Alligator mississippiensis</i>	Alligator, American	T/SA						X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T		X		X	X	X
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T		X		X	X	X
Reptiles	<i>Crocodylus acutus</i>	Crocodile, American	E	X	X		X	X	X
Reptiles	<i>Dermochelys coriacea</i>	Turtle, leatherback sea	E		X		X	X	X
Reptiles	<i>Drymarchon corais couperi</i>	Snake, eastern indigo	T		X		X	X	X
Reptiles	<i>Eretmochelys imbricata</i>	Turtle, hawksbill sea (=carey)	E		X		X	X	X
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E		X		X	X	X
Snails	<i>Orthalicus reses</i>	Snail, Stock Island tree	T				X	X	

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# Vermont Yankee

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T				X	X	X
Clams	<i>Alasmidonta heterodon</i>	Mussel, dwarf wedge	E				X	X	X
Clams	<i>Alasmidonta varicosa</i>	Brook floater (mussel)	SC						X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E				X	X	
Insects	<i>Cicindela puritana</i>	Beetle, Puritan tiger	T					X	
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E					X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E				X	X	
Mammals	<i>Felis lynx canadensis</i>	North American lynx	SC	X					
Mammals	<i>Gulo gulo luscus</i>	North American wolverine	SC	X					
Mammals	<i>Myotis leibii</i>	Eastern small-footed bat	SC	X					
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E	X			X	X	
Mammals	<i>Sylvilagus transitionalis</i>	New England cottontail rabbit	SC	X					
Plants	<i>Astragalus robbinsii jesupi</i>	Jesup's milk-vetch	E					X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	
Plants	<i>Potentilla robbinsiana</i>	Robbins' cinquefoil	E					X	
Plants	<i>Scirpus ancistrochaetus</i>	Northeastern (=Barbed bristle) bulrush	E				X	X	

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# Vogle

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Ambystoma cingulatum</i>	Flatwoods salamander	SC						X
Amphibians	<i>Notophthalmus perstriatus</i>	Striped newt	SC						X
Amphibians	<i>Rana areolata aesopus</i>	Florida crawfish (=gopher) frog	SC	X					X
Amphibians	<i>Rana areolata capito</i>	Carolina crawfish (=gopher) frog	SC	X					X
Birds	<i>Aimophila aestivalis</i>	Bachman's sparrow	SC	X					X
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T					X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Falco sparverius paulus</i>	Southeastern American kestrel	SC	X					X
Birds	<i>Grus americana</i>	Crane, whooping	E				X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T		X		X	X	X
Birds	<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike	SC	X					X
Birds	<i>Mycteria americana</i>	Stork, wood	E		X		X	X	X
Birds	<i>Passerina ciris ciris</i>	Eastern painted bunting	SC	X					
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E		X		X	X	X
Birds	<i>Thryomanes bewickii altus</i>	Appalachian Bewick's wren	SC						X
Clams	<i>Alasmidonta arcula</i>	Altamaha arc-mussel	SC						X
Clams	<i>Cyprogenia stegaria</i>	Fanshell	E					X	
Clams	<i>Elliptio shepardiana</i>	Altamaha lance (mussel)	SC						X
Clams	<i>Elliptio spinosa</i>	Altamaha spinymussel (=Georgia spiny	SC						X
Clams	<i>Fusconaia masoni</i>	Atlantic pigtoe (mussel)	SC						X
Clams	<i>Lampsilis cariosa</i>	Yellow lampmussel	SC	X					X
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E		X		X	X	X
Fishes	<i>Cyprinella callisema</i>	Ocmulgee shiner	SC						X
Fishes	<i>Cyprinella callitaenia</i>	Bluestripe shiner	SC						X
Fishes	<i>Moxostoma robustum</i>	Robust (=bighead) redhorse	SC	X					X
Fishes	<i>Notropis xaenurus</i>	Altamaha shiner	SC						X

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# Vogtle

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Insects	<i>Cordulegaster sayi</i>	Say's spiketail (dragonfly)	SC						X
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E				X	X	
Mammals	<i>Myotis austroriparius</i>	Southeastern myotis (bat)	SC						X
Mammals	<i>Myotis grisescens</i>	Bat, gray	E						X
Mammals	<i>Neotoma floridana magister</i>	Alleghany (=Eastern) woodrat	SC	X					
Mammals	<i>Trichechus manatus</i>	Manatee, West Indian (=Florida)	E					X	
Mammals	<i>Ursus americanus floridanus</i>	Florida black bear	C	X					
Plants	<i>Allium speculae</i>	Onion, Flatrock	SC						X
Plants	<i>Amphianthus pusillus</i>	Little amphianthus	T					X	X
Plants	<i>Aster avitus</i>	Rock-aster, Alexander's	SC						X
Plants	<i>Balduina atropurpurea</i>	Honeycomb Head	SC						X
Plants	<i>Calamintha ashei</i>	Ashe savory	SC						X
Plants	<i>Cuscuta harperi</i>	Dodder, Harper's	SC						X
Plants	<i>Echinacea laevigata</i>	Smooth coneflower	E				X	X	
Plants	<i>Eriocaulon kornickianum</i>	Pipewort, small-headed	SC						X
Plants	<i>Helianthus schweinitzii</i>	Schweinitz's sunflower	E					X	
Plants	<i>Hymenocallis coronaria</i>	Spider-lily, shoals	SC						X
Plants	<i>Isoetes melanospora</i>	Black-spored quillwort	E						X
Plants	<i>Isoetes tegetiformans</i>	Mat-forming quillwort	E					X	X
Plants	<i>Lindera melissifolia</i>	Pondberry	E					X	
Plants	<i>Lindera subcoriacea</i>	Bog spicebush	SC						X
Plants	<i>Litsea aestivalis</i>	Pondspice	SC						X
Plants	<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E					X	
Plants	<i>Macbridea caroliniana</i>	Carolina birds-in-a-nest	SC						X
Plants	<i>Marshallia ramosa</i>	Southern Marshallia	SC						X
Plants	<i>Oxypolis canbyi</i>	Canby's dropwort	E				X	X	X

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# Vogtle

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Ptilimnium nodosum</i>	Harperella	E				X	X	X
Plants	<i>Rhus michauxii</i>	Michaux's sumac	E					X	
Plants	<i>Ribes echinellum</i>	Miccosukee gooseberry	T					X	
Plants	<i>Rudbeckia nitida nitida</i>	Coneflower, yellow	SC						X
Plants	<i>Schwalbea americana</i>	American chaffseed	E					X	
Plants	<i>Scutellaria ocmulgee</i>	Skullcap, Ocmulgee	SC						X
Plants	<i>Stewartia malacodendron</i>								X
Plants	<i>Stylisma pickeringii</i>	Morning-glory, Pickering's	SC						X
Plants	<i>Trillium reliquum</i>	Relict trillium	E				X	X	X
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T					X	
Reptiles	<i>Drymarchon corais couperi</i>	Snake, eastern indigo	T				X	X	X
Reptiles	<i>Gopherus polyphemus</i>	Tortoise, gopher	SC						X
Reptiles	<i>Heterodon simus</i>	Southern hognose snake	SC	X					X
Reptiles	<i>Pituophis melanoleucus melanoleucus</i>	Northern pine snake	SC	X					
Reptiles	<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	SC	X					X

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Vogtle

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# Waterford

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T				X	X	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	
Birds	<i>Falco sparverius paulus</i>	Southeastern American kestrel	SC	X					
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	X
Birds	<i>Pelecanus occidentalis</i>	Pelican, brown	E	X			X	X	
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E				X	X	
Clams	<i>Potamilus inflatus</i>	Heelsplitter, inflated	T				X	X	
Fishes	<i>Acipenser oxyrhynchus desotoi</i>	Sturgeon, Gulf	T				X	X	X
Fishes	<i>Scaphirhynchus albus</i>	Sturgeon, pallid	E				X	X	X
Mammals	<i>Ursus americanus luteolus</i>	Bear, Louisiana black	T					X	
Plants	<i>Isoetes louisianensis</i>	Louisiana quillwort	E					X	
Reptiles	<i>Caretta caretta</i>	Turtle, loggerhead sea	T					X	
Reptiles	<i>Chelonia mydas</i>	Turtle, green sea	E,T					X	
Reptiles	<i>Gopherus polyphemus</i>	Tortoise, gopher	SC				X	X	
Reptiles	<i>Graptemys oculifera</i>	Turtle, ringed map (=sawback)	T					X	
Reptiles	<i>Lepidochelys kempii</i>	Turtle, Kemp's (=Atlantic) ridley sea	E				X	X	

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# Watts Bar

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Amphibians	<i>Cryptobranchus alleganiensis</i>	Hellbender	SC	X					
Amphibians	<i>Gyrinophilus palleucus</i>	Tennessee cave salamander	SC						X
Arachnids	<i>Microhexura montivaga</i>	Spider, spruce-fir moss	E					X	
Birds	<i>Aimophila aestivalis</i>	Bachman's sparrow	SC						X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X	X		X	X	X
Birds	<i>Picoides borealis</i>	Woodpecker, red-cockaded	E				X	X	
Clams	<i>Alasmidonta atropurpurea</i>	Cumberland elktoe (mussel)	E					X	
Clams	<i>Alasmidonta raveneliana</i>	Elktoe, Appalachian	E					X	
Clams	<i>Cyprogenia stegaria</i>	Fanshell	E	X	X		X	X	X
Clams	<i>Dromus dromas</i>	Pearlymussel, dromedary	E	X	X		X	X	X
Clams	<i>Epioblasma brevidens</i>	Cumberlandian combshell	E					X	
Clams	<i>Epioblasma capsaeformis</i>	Oyster mussel	E					X	
Clams	<i>Epioblasma florentina florentina</i>	Pearlymussel, yellow-blossom	E				X	X	
Clams	<i>Epioblasma metastriata</i>	Combshell, upland	E					X	
Clams	<i>Epioblasma othcaloogensis</i>	Acornshell, southern	E					X	
Clams	<i>Epioblasma walkeri</i>	Riffleshell, tan	E					X	
Clams	<i>Fusconaia cuneolus</i>	Pigtoe, fine-rayed	E				X	X	
Clams	<i>Lampsilis altilis</i>	Pocketbook, fine-lined	T					X	
Clams	<i>Lampsilis orbiculata</i>	Pearlymussel, pink mucket	E	X	X		X	X	X
Clams	<i>Lampsilis virescens</i>	Lampmussel, Alabama (=Pearlymussel,	E					X	
Clams	<i>Medionidus acutissimus</i>	Moccasinshell, Alabama	T					X	
Clams	<i>Medionidus parvulus</i>	Moccasinshell, Coosa	E					X	
Clams	<i>Pegias fabula</i>	Pearlymussel, little-wing	E					X	
Clams	<i>Plethobasus cooperianus</i>	Pearlymussel, orange-foot pimpleback	E				X	X	X
Clams	<i>Pleurobema decisum</i>	Clubshell, southern	E					X	

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# Watts Bar

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				FES	FWS	Other	GS 32K	GS 100K	
Clams	<i>Pleurobema georgianum</i>	Pigtoe, southern	E					X	
Clams	<i>Pleurobema gibberum</i>	Pigtoe, Cumberland (=Cumberland pigtoe	E					X	
Clams	<i>Pleurobema oviforme</i>	Tennessee clubshell (mussel)	SC	X					
Clams	<i>Pleurobema perovatum</i>	Clubshell, ovate	E					X	
Clams	<i>Pleurobema plenum</i>	Pigtoe, rough	E	X	X		X	X	
Clams	<i>Pleurobema pyramidatum</i>	Pink pigtoe (mussel)	SC	X					
Clams	<i>Ptychobranhus greeni</i>	Kidneyshell, triangular	E					X	
Clams	<i>Villosa perpurpurea</i>	Purple bean (=Fine-rayed purple	E				X	X	
Clams	<i>Villosa trabalis</i>	Pearlymussel, Cumberland bean	E					X	
Fishes	<i>Cycleptus elongatus</i>	Blue sucker	SC	X					
Fishes	<i>Cyprinella caerulea</i>	Shiner, blue	T				X	X	
Fishes	<i>Etheostoma sp. (Duskytail)</i>	Darter, duskytail	E				X	X	
Fishes	<i>Hybopsis monacha</i>	Chub, spotfin (=turquoise shiner)	T				X	X	
Fishes	<i>Noturus baileyi</i>	Madtom, smoky	E				X	X	
Fishes	<i>Noturus flavipinnis</i>	Madtom, yellowfin	T				X	X	
Fishes	<i>Percina antesella</i>	Darter, amber	E					X	
Fishes	<i>Percina aurolineata</i>	Darter, goldline	T					X	
Fishes	<i>Percina jenkinsi</i>	Logperch, Conasauga	E				X	X	
Fishes	<i>Percina tanasi</i>	Darter, snail	T	X	X		X	X	X
Fishes	<i>Phoxinus cumberlandensis</i>	Dace, blackside	T					X	
Mammals	<i>Canis rufus</i>	Wolf, red	E				X	X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E				X	X	
Mammals	<i>Glaucomys sabrinus coloratus</i>	Squirrel, Carolina northern flying	E					X	
Mammals	<i>Myotis grisescens</i>	Bat, gray	E	X	X		X	X	X
Mammals	<i>Myotis leibii</i>	Eastern small-footed bat	SC						X
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	

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# Watts Bar

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Plants	<i>Apios priceana</i>	Price's potato-bean	T					X	
Plants	<i>Arenaria cumberlandensis</i>	Cumberland sandwort	E					X	
Plants	<i>Aureolaria patula</i>	Foxglove, False	SC	X					
Plants	<i>Cimicifuga rubifolia</i>	Bugbane, Appalachian	SC	X					X
Plants	<i>Conradina verticillata</i>	Cumberland rosemary	T				X	X	
Plants	<i>Delphinium exaltatum</i>	Larkspur, tall	SC	X					
Plants	<i>Geum radiatum</i>	Spreading avens	E					X	
Plants	<i>Gymnoderma lineare</i>	Lichen, rock gnome	E					X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	
Plants	<i>Marshallia mohrii</i>	Mohr's Barbara's buttons	T					X	
Plants	<i>Pityopsis ruthii</i>	Ruth's golden aster	E					X	
Plants	<i>Sarracenia oreophila</i>	Green pitcher-plant	E					X	
Plants	<i>Scutellaria montana</i>	Large-flowered skullcap	E				X	X	
Plants	<i>Spiraea virginiana</i>	Virginia spiraea	T				X	X	
Plants	<i>Tomanthera auriculata</i>	False-foxglove, auriculate	SC	X					
Plants	<i>Xyris tennesseensis</i>	Tennessee yellow-eyed grass	E					X	
Snails	<i>Athearnia anthonyi</i>	Riversnail, Anthony's	E					X	
Snails	<i>Marstonia ogmoraphe</i>	Marstonia (snail, royal (=obese)	E					X	
Snails	<i>Mesodon clarki nantahala</i>	Snail, noonday	T					X	

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# WNP-2

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Accipiter gentilis</i>	Northern goshawk	SC			X			
Birds	<i>Athene cunicularia hypugea</i>	Western burrowing owl	SC	X					X
Birds	<i>Brachyramphus marmoratus marmoratus</i>	Murrelet, marbled	T					X	
Birds	<i>Branta canadensis leucopareia</i>	Goose, Aleutian Canada	T			X			
Birds	<i>Buteo regalis</i>	Ferruginous hawk	SC			X			X
Birds	<i>Centrocercus urophasianus phaios</i>	Western sage grouse	SC	X					X
Birds	<i>Chlidonias niger</i>	Black tern	SC			X			X
Birds	<i>Contopus borealis</i>	Fly-catcher, Olive-sided	SC			X			X
Birds	<i>Empidonax traillii extimus</i>	Flycatcher, southwestern willow	E			X			
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E			X	X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X	X	X	X	X	X
Birds	<i>Lanius ludovicianus</i>	Shrike, Loggerhead	SC	X		X			X
Birds	<i>Strix occidentalis caurina</i>	Owl, northern spotted	T					X	
Clams	<i>Anodonta californiensis</i>	California floater (mussel)	SC			X			
Fishes	<i>Lampetra ayresi</i>	River Lamprey	SC			X			X
Fishes	<i>Lampetra tridentata</i>	Pacific lamprey	SC						X
Fishes	<i>Oncorhynchus nerka</i>	Salmon, sockeye (=red, =blueback)	E	X			X	X	
Fishes	<i>Oncorhynchus tshawytscha</i>	Salmon, chinook	E,T	X			X	X	
Fishes	<i>Salvelinus confluentus</i>	Bull trout	C			X			X
Insects	<i>Limenitus archippus lahontani</i>	Nevada viceroy (butterfly)	SC			X			
Mammals	<i>Brachylagus idahoensis</i>	Pygmy rabbit	SC						X
Mammals	<i>Canis lupus</i>	Wolf, gray	E,T					X	
Mammals	<i>Myotis leibii</i>	Eastern small-footed bat	SC			X			X
Mammals	<i>Myotis thysanodes</i>	Fringed myotis (bat)	SC			X			X
Mammals	<i>Myotis volans</i>	Long-legged myotis (bat)	SC			X			
Mammals	<i>Myotis yumanensis</i>	Yuma myotis (bat)	SC			X			X

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# WNP-2

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Mammals	<i>Plecotus townsendii townsendii</i>	Pacific Townsend's big-eared bat	SC			X			X
Mammals	<i>Spermophilus washingtoni</i>	Washington ground squirrel	SC						X
Mammals	<i>Ursus arctos</i>	Bear, grizzly (=brown)	T					X	
Plants	<i>Astragalus columbianus</i>	Milk-vetch, Columbia	SC			X			X
Plants	<i>Lomatium tuberosum</i>	Desert-parsley, Hoover's	SC			X			X
Plants	<i>Rorippa columbiae</i>	Yellow-cress, Columbia	SC			X			X
Reptiles	<i>Sceloporus graciosus graciosus</i>	Northern sagebrush lizard	SC			X			X
Snails	<i>Fluminicola columbianus</i>	Columbia pebblesnail (=Great Columbia River	SC			X			X

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# Wolf Creek

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Accipiter gentilis</i>	Northern goshawk	SC	X					
Birds	<i>Dendroica cerulea</i>	Cerulean warbler	SC	X					
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X	X		X	X	X
Birds	<i>Grus americana</i>	Crane, whooping	E				X	X	
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X	X		X	X	X
Birds	<i>Lanius ludovicianus</i>	Shrike, Loggerhead	SC	X					
Birds	<i>Laterallus jamaicensis</i>	Black rail	SC	X					
Birds	<i>Sterna antillarum</i>	Tern, least	E	X					
Clams	<i>Cyprogenia aberti</i>	Western fanshell (=western fan-shell	SC	X					
Fishes	<i>Cycleptus elongatus</i>	Blue sucker	SC	X					
Fishes	<i>Noturus placidus</i>	Madtom, Neosho	T	X			X	X	X
Fishes	<i>Scaphirhynchus albus</i>	Sturgeon, pallid	E					X	
Insects	<i>Nicrophorus americanus</i>	Beetle, American burying (=giant carrion)	E					X	
Mammals	<i>Myotis grisescens</i>	Bat, gray	E					X	
Mammals	<i>Spilogale putorius interrupta</i>	Plains spotted skunk	SC	X					
Plants	<i>Asclepias meadii</i>	Mead's milkweed	T	X			X	X	X
Plants	<i>Platanthera praeclara</i>	Western prairie fringed orchid	T	X			X	X	X
Plants	<i>Trifolium stoloniferum</i>	Running buffalo clover	E					X	
Reptiles	<i>Graptemys pseudogeographica</i>	False map turtle	SC	X					
Reptiles	<i>Macrolemys temmincki</i>	Alligator snapping turtle	SC	X					

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# Yankee Rowe

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E					X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T			X	X	X	X
Clams	<i>Alasmidonta heterodon</i>	Mussel, dwarf wedge	E					X	
Fishes	<i>Acipenser brevirostrum</i>	Sturgeon, shortnose	E				X	X	
Insects	<i>Cicindela puritana</i>	Beetle, Puritan tiger	T				X	X	
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E					X	
Mammals	<i>Felis concolor cougar</i>	Cougar, eastern	E				X	X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Astragalus robbinsii jesupi</i>	Jesup's milk-vetch	E					X	
Plants	<i>Isotria medeoloides</i>	Small whorled pogonia	T				X	X	
Plants	<i>Scirpus ancistrochaetus</i>	Northeastern (=Barbed bristle) bulrush	E				X	X	

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Yankee Rowe

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# Zion

Class	Species	Common Name	Status	Previously Identified*					1996 FWS or NMFS
				FES	FWS	Other	GS 32K	GS 100K	
Birds	<i>Accipiter gentilis</i>	Northern goshawk	SC	X					
Birds	<i>Ammodramus henslowii</i>	Sparrow, Henslow's	SC						X
Birds	<i>Charadrius melodus</i>	Plover, piping	E,T	X			X	X	
Birds	<i>Chlidonias niger</i>	Black tern	SC	X					X
Birds	<i>Falco peregrinus</i>	Falcon, Peregrine	E	X			X	X	X
Birds	<i>Haliaeetus leucocephalus</i>	Eagle, bald	T	X			X	X	
Birds	<i>Sterna hirundo</i>	Common tern (Great Lakes population)	SC	X					X
Fishes	<i>Acipenser fulvescens</i>	Lake sturgeon	SC	X					X
Fishes	<i>Coregonus kiyi</i>	Kiyi	SC	X					
Fishes	<i>Coregonus reighardi</i>	Shortnose cisco	SC	X					
Insects	<i>Aflexia rubranura</i>	Redveined prairie leafhopper	SC						X
Insects	<i>Lycaeides melissa samuelis</i>	Butterfly, Karner blue	E				X	X	X
Insects	<i>Somatochlora hineana</i>	Dragonfly, Hine's (=Ohio) emerald	E					X	
Mammals	<i>Myotis sodalis</i>	Bat, Indiana	E				X	X	
Plants	<i>Agalinis auriculata</i>	False-foxglove, auriculate	SC						X
Plants	<i>Agalinis skinneriana</i>	False-foxglove, purple	SC						X
Plants	<i>Aster furcatus</i>	Aster	SC						X
Plants	<i>Cirsium pitcheri</i>	Pitcher's thistle	T					X	X
Plants	<i>Hymenoxys acaulis glabra</i>	Lakeside daisy	T					X	
Plants	<i>Lespedeza leptostachya</i>	Prairie bush-clover	T					X	
Plants	<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid	T				X	X	X
Reptiles	<i>Clonophis kirtlandii</i>	Kirtland's snake	SC						X
Reptiles	<i>Emydoidea blandingii</i>	Blanding's turtle	SC	X					X
Reptiles	<i>Sistrurus catenatus catenatus</i>	Eastern massasauga	SC						X

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