

# **U.S. NUCLEAR REGULATORY COMMISSION** ENVIRONMENTAL STANDARD **REVIEW PLAN** OFFICE OF NUCLEAR REACTOR REGULATION

## 2.4.1 TERRESTRIAL ECOLOGY

**REVIEW RESPONSIBILITIES** 

Primary—Appendix B

Secondary—Appendix B

### I. AREAS OF REVIEW



This environmental standard review plan (ESRP) directs the staff's description of the terrestrial environment and biota of the site, transmission corridors, and offsite areas likely to be impacted by the construction, maintenance, or operation of the proposed project. This review should provide input to reviews dealing with evaluation of construction or operational impacts on terrestrial ecosystems and to other reviews that are concerned with land use.

The scope of the review directed by this plan includes identification and description of species composition, spatial and temporal distribution, abundance, and other structural and functional attributes of biotic assemblages that could be impacted by the proposed action. The scope should also include the identification of any "important" terrestrial natural resources (see Table 2.4.1-1 on p. 2.4.1-7) and the location of wildlife sanctuaries and natural areas that might be impacted by the proposed action.

### **Review Interfaces**

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following ESRPs, as indicated:

• ESRP 2.2.1. Obtain information about land use of the site and vicinity to complete the description of the site's terrestrial ecology.

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2.4.1-1

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#### USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The environmental standard review plans are keyed to Preparation of Environmental Reports for Nuclear Power Stations.

Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- <u>ESRP 2.2.2</u>. Obtain information about land use of the transmission line corridors, access corridors, and other pertinent offsite areas to complete the description of the site's terrestrial ecology.
- <u>ESRP 2.8</u>. Provide appropriate information on the principal terrestrial ecological features of the site and vicinity in sufficient detail to allow for an evaluation of the cumulative impacts to the terrestrial ecosystems resulting from related Federal project activities.
- <u>ESRP 4.1.1</u>. Provide appropriate information on the principal terrestrial ecological features of the site and vicinity in sufficient detail to allow for an evaluation of land-use impacts resulting from site and vicinity construction.
- <u>ESRP 4.1.2</u>. Provide appropriate information on the principal terrestrial ecological features of the transmission corridors and offsite areas in sufficient detail to allow for an evaluation of land-use impacts resulting from transmission corridor and other offsite facility construction.
- <u>ESRP 4.3.1</u>. Provide information on the principal terrestrial ecological features of the site and vicinity in sufficient detail to allow for an evaluation of the impacts on the terrestrial ecosystems resulting from construction.
- <u>ESRPs 5.1.1 and 5.1.2</u>. Provide information on the principal terrestrial ecological features of the site and vicinity in sufficient detail to allow for an evaluation of land-use impacts resulting from operation of the power station.
- <u>ESRP 5.3.3.2</u>. Provide information on the site's terrestrial ecology so that a description of impacts on the terrestrial ecosystem from operation of the heat-dissipation systems can be completed.
- <u>ESRP 5.4.4</u>. Provide information on the principal terrestrial ecological features of the site and vicinity in sufficient detail to allow for the evaluation of the radiological impacts on the terrestrial ecosystem due to normal plant operation.
- <u>ESRP 5.6.1</u>. Provide information on the site's terrestrial ecology so that an evaluation of impacts on the terrestrial ecosystem from operation or maintenance of the transmission system can be completed.
- <u>ESRP 6.5.1</u>. Provide information on the principal terrestrial ecological features of the site and vicinity in sufficient detail to allow for the evaluation of the terrestrial monitoring programs.

# Data and Information Needs

The type of data and information needed will be affected by site- and station-specific factors, and the degree of detail should be modified according to the anticipated magnitude of the potential impacts. Refer to Table 2.4.1-1 (see p. 2.4.1-7) for a listing of species and habitat criteria for designation of "important" species and resources. The following data or information should be obtained:

- a map that identifies "important" terrestrial habitats on and in the vicinity of the site
- a description and map of the area occupied by each natural and man-made habitat type (from the environmental report [ER])
- U.S. Geological Survey (USGS) topographic maps of the site (7<sup>1</sup>/<sub>2</sub> min. scale, when available) (from the general literature)
- list and description of "important" species and their spatial and temporal distributions on and in the vicinity of the site, including, as appropriate, their relative abundance, critical habitat, and their life histories—critical life stages, biologically significant activities, seasonal habitat requirements and population fluctuations, food chain, and other interspecific relationships (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- list of species that are of concern as disease vectors or pests. Detailed field surveys of such species are not needed (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies).
- a qualitative estimate of the importance of habitat of threatened, endangered, and other "important" species on and in the vicinity of the site relative to the habitat of such species throughout their entire range (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- locations of travel corridors for "important" terrestrial species and alternate routes for those corridors that could potentially be blocked by use of the site (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- a description of natural and man-induced effects (e.g., farming, logging, grazing, burning), preexisting environmental stresses (e.g., infestations, epidemics, catastrophes), and the current ecological conditions that are indicative of such stresses (from the ER)
- a description and location of any ecological or biological studies of the site or its environs that are recent or currently in progress (from the ER and the general literature)
- documentation that the applicant has consulted with the appropriate Federal and State agencies (e.g., as required by the Fish and Wildlife Coordination Act) and affected Native American tribes (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies).

The following data and information about transmission corridors and offsite areas should be obtained:

- a list of "important" terrestrial habitats and a map that identifies these habitats along routes of transmission and access corridors from the station site to interconnecting points on the high voltage system
- major vegetation types within the proposed corridors (from the ER, site visit, and through consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- a list of "important" species known to occur within and adjacent to the proposed corridors, their spatial and temporal distributions, critical habitats (as appropriate), and their life histories (including critical life stages, biologically significant activities, seasonal habitat requirements and population fluctuations, food chain and other interspecific relationships) (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- where proposed transmission lines cross important waterfowl areas, a list of descriptions of these areas and data on the local abundance and distribution of waterfowl, their seasonal status, and local flight patterns (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- lists of species that are of concern as disease vectors or pests. Detailed field surveys of such species are not needed (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)
- a more-detailed examination of any segment of the rights-of-way determined to be particularly sensitive to impacts of construction
- a summary of any preexisting environmental stress from such sources such as pollutants, as well as pertinent ecological conditions suggestive of such stresses. A discussion of histories of any infestations, epidemics, or catastrophes (caused by natural phenomena) that have had a significant impact on biota in the vicinity of the transmission corridors should also be included.

# II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of terrestrial ecology on and in the vicinity of the site and transmission corridors are based on the relevant requirements of the following:

- 10 CFR 51.75 with respect to descriptions of the environment affected by the issuance of a construction permit
- 10 CFR 52, Subpart A, with respect to descriptions of the environment affected by the issuance of an early site permit
- 10 CFR 51.95 with respect to the preparation of supplemental environmental impact statements (EISs) in support of the issuance of an operating license

- Bald and Golden Eagle Protection Act with respect to the prohibition of taking, possessing, selling, transporting, importing, or exporting the bald or golden eagle, dead or alive, without a permit
- Endangered Species Act of 1973 with respect to identifying threatened and endangered species, critical habitats, formal or informal consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service
- Fish and Wildlife Coordination Act of 1958 with respect to consideration of fish and wildlife resources in the planning of development projects that affect water resources
- Migratory Bird Treaty Act with respect to declaring that it is unlawful to take, import, export, possess, buy, sell, purchase, or barter any migratory bird. Feathers or other parts of nests and eggs, and products made from migratory birds are also covered by the Act. "Take" is defined as pursuing, hunting, shooting, poisoning, wounding, killing, capturing, trapping, or collecting.

Regulatory positions and specific criteria necessary to meet the regulations as identified above are as follows:

- Regulatory Guide 4.7, Rev. 2, *General Site Suitability for Nuclear Power Stations* (NRC 1998), contains guidance concerning the ecological systems and biota at potential sites and their environs should be sufficiently well-known to allow reasonably certain predictions that there would be no unacceptable or unnecessary deleterious impacts on populations of important species or on ecological systems with which they are associated from the construction or operation of a nuclear power station at the site. The reviewer should ensure that the applicant's description of the site and transmission corridors identifies important species or ecological systems that could potentially be impacted by station and transmission corridor construction or operation.
- Regulatory Guide 4.11, Rev. 1, *Terrestrial Environmental Studies for Nuclear Power Stations* (NRC 1977), contains technical information for the design and execution of terrestrial environmental studies, the results of which may be appropriate for inclusion in the applicant's ER. The reviewer should ensure that the appropriate results are included in the ER.

## Technical Rationale

The technical rationale for evaluating the applicant's description of the area's terrestrial ecology is discussed in the following paragraph:

A detailed and thorough description of the terrestrial ecology in the vicinity of the power station site and associated transmission corridors is essential for the evaluation of potential impacts to the terrestrial environment that may result from plant construction or operation. Use of these acceptance criteria should help ensure inclusion of the terrestrial ecological attributes most needed to predict impacts.

### III. <u>REVIEW PROCEDURES</u>

The reviewer should ensure that the ecological information is adequate to serve as a basis for assessment of the impacts of design and siting of the plant, and plant construction and operation. In evaluating the adequacy of the description of terrestrial resources of the site and offsite areas, the reviewer should consult the applicable acceptance criteria of this ESRP. Within these criteria, the reviewer will find a framework of those descriptive features of terrestrial resources judged adequate for most situations of nuclear power station siting. The reviewer should also become familiar with the provisions of the legislation listed in this ESRP.

With these guidelines in mind, the reviewer should take the following steps:

- (1) Identify the species and habitats that will be considered "important" ecological resources of the site, vicinity, transmission corridors, and offsite areas for evaluation of potential impacts on them, using Table 2.4.1-1 as a reference.
- (2) Consult with local offices of the appropriate Federal, State, regional, local, and affected Native American tribal agencies to determine the possible presence of such species.
- (3) Identify the threatened and endangered species that, based on known distributions, could be present within these areas, but that have not been recorded by documented observations.
- (4) In the case of commercially or recreationally valuable species, list the types of wildlife and plants that could be adversely impacted by the proposed action, and in addition to the applicant's ER, consult with State or local agencies or organizations that maintain records of harvest levels of these species.
- (5) Review the available site-specific data for adequacy, accuracy, and completeness.

# IV. EVALUATION FINDINGS

The depth and extent of the input to the EIS should be governed by the kinds of terrestrial ecological resources that could be affected by plant construction or operation and by the nature and magnitude of the expected impacts to these resources. The reviewer should prepare input to the EIS descriptions of the site and offsite areas potentially affected by the proposed project. The input should be brief and should include the following information:

• the principal terrestrial ecological features of the site and vicinity, transmission and access corridors, and offsite areas, with emphasis on the communities that will be potentially affected by proposed project construction, operation, or maintenance. This information should be based on an analysis of at least one full year of data, to reflect seasonal variations in terrestrial populations. Thus, the extent of discussion of various plant and animal communities should be adequate to support the impact assessments for ESRP Chapters 4.0 and 5.0.

Species	Habitat
<ul> <li>Rare species</li> <li>Listed as threatened or endangered at</li> <li>50 CEB 17.11 (Tiple or derild) for an analysis of the second sec</li></ul>	Wildlife sanctuaries, refuges, or preserves, if they may be adversely affected by plant or transmis- sion line construction or operation
50 CFR 17.11 (Fish and Wildlife) or 50 CFR 17.12 (Plants). This information may also be found via the Internet at the U.S. Fish and Wildlife Homepage in GEn&SIS.	Habitats identified by State or Federal agencies as unique, rare, or of priority for protection, if these areas may be adversely affected by plant or transmission line operation and maintenance
• Proposed for listing as threatened or endan- gered, or is a candidate for listing in the most current list of such species as published in the <i>Federal Register</i> . This information may also be found via the Internet at the U.S. Fish and Wildlife Homepage in GEn&SIS.	Wetlands (Executive Order 11990), floodplains (Executive Order 11988), or other resources specifically protected by Federal regulations or Executive Orders, or by State regulations
• Listed as a threatened, endangered, or other species of concern by the State or States in which the proposed facilities are located	Land areas identified as "critical habitat" for species listed as threatened or endangered by the U.S. Fish and Wildlife Service
Commercially or recreationally valuable species	
Species that are essential to the maintenance and survival of species that are rare and commercially or recreationally valuable (as defined previously)	
Species that are critical to the structure and function of the local terrestrial ecosystem	
Species that may serve as biological indicators to monitor the effects of the facilities on the terres- trial environment	

### Table 2.4.1-1. Important Species and Habitats

- wildlife sanctuaries, natural areas, and related areas that could be affected
- a discussion of "important" species that may be affected by plant or transmission corridor construction or operation. Estimates of their abundance should be provided when appropriate. Special habitat needs, such as cover, forage, and prey species, should be emphasized if the proposed project would potentially disrupt these needs.
- a summary of the consultations with appropriate Federal, State, regional, local, and affected Native American tribal agencies, including the U. S. Fish and Wildlife Service (through the regional director) and the director of the State Fish and Wildlife agency.

### V. IMPLEMENTATION

The method described herein will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant proposes an acceptable alternative for complying with specified portions of the regulations.

## VI. <u>REFERENCES</u>

10 CFR 51, Subpart A, "National Environmental Policy Act—Regulations Implementing Section 102(2)."

10 CFR 51.45, "Environmental report."

10 CFR 51.75, "Draft environmental impact statements—production and utilization facilities: draft environmental impact statement—construction permit."

10 CFR 51.95, "Final environmental impact statements—production and utilization facilities: supplement to final environmental impact statement."

10 CFR 52, Subpart A, "Early Site Permits."

10 CFR 52.79, "Contents of application; technical information."

50 CFR 17.11, "Fish and wildlife."

50 CFR 17.12, "Plants."

Bald and Golden Eagle Protection Act of 1940, as amended, 16 USC 668 et. seq.

Endangered Species Act, as amended, 16 USC 1531 et seq.

Executive Order 11988, "Floodplain Management."

Executive Order 11990, "Protection of Wetlands."

Fish and Wildlife Coordination Act Amendment, 16 USC 661 et seq.

Migratory Bird Treaty Act, as amended, 16 USC 703 et seq.

U.S. Nuclear Regulatory Commission (NRC). 1977. *Terrestrial Environmental Studies for Nuclear Power Stations*. Regulatory Guide 4.11, Rev. 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1998. *General Site Suitability for Nuclear Power Stations*. Regulatory Guide 4.7, Rev. 2, Washington, D.C.



# U.S. NUCLEAR REGULATORY COMMISSION ENVIRONMENTAL STANDARD REVIEW PLAN OFFICE OF NUCLEAR REACTOR REGULATION

## 4.3.1 TERRESTRIAL ECOSYSTEMS

**REVIEW RESPONSIBILITIES** 

Primary—Appendix B

Secondary—Appendix B

### I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's description, quantification, and assessment of the impacts of construction on the terrestrial ecosystem. The scope of the review directed by this plan includes an assessment of both onsite and offsite construction, including transmission line and access corridor construction. The assessment should be in sufficient detail to (1) predict and evaluate the significance of potential impacts to "important" species and their habitats and (2) evaluate how these impacts should be considered in the licensing decision. If necessary, the reviewer should suggest consideration of alternative designs or construction practices, or licensee commitments to mitigate the intensity of environmental impacts.

### Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to reviewers for the following ESRPs, as indicated:

- <u>ESRP 2.4.1</u>. Obtain descriptive material on the terrestrial ecology of the site and vicinity needed to support the analyses made in ESRP 4.3.1. The reviewer for ESRP 4.3.1 should also provide input on significant impacts of construction to the terrestrial environment.
- <u>ESRP 3.1</u>. Obtain information about the power plant's external appearance and layout in enough detail to support the analyses made in ESRP 4.3.1.

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Published environmental standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555-0001.

- ESRP 3.4.2. Obtain information on cooling system in enough detail to support analysis of bird impacts with cooling towers.
- <u>ESRP 3.7</u>. Obtain information about the power transmission system in enough detail to support the analyses made in ESRP 4.3.1.
- <u>ESRP 4.1.1</u>. Obtain information regarding impacts of construction on land use onsite and in the vicinity of the plant to complete the description of construction impacts on the terrestrial ecosystem.
- <u>ESRP 4.1.2</u>. Obtain information regarding impacts to land use in transmission corridors and offsite areas to complete the description of construction impacts on the terrestrial ecosystem.
- <u>ESRP 4.2.2</u>. Obtain information regarding impacts on water use to complete the description of construction impacts on the terrestrial ecosystem.
- <u>ESRP 4.4.2</u>. Provide information regarding impacts to the terrestrial ecosystem from construction so that an evaluation of social and economic impacts from construction can be completed.
- <u>ESRP 4.6</u>. Provide a list of applicant commitments and staff evaluations of practices to limit adverse environmental impacts of construction.
- <u>ESRP 6.5.1</u>. Provide appropriate information on impacts to the terrestrial environment from construction activities in sufficient detail to allow for the evaluation of the applicant's proposed monitoring program.
- <u>ESRP 9.4</u>. If the reviewer determines that a proposed construction activity will result in an adverse environmental impact that cannot be mitigated by alternative construction practices and procedures, then provide the reviewer of ESRP 9.4 with a notification that alternative locations and plant or component designs should be considered.
- <u>ESRP 10.1</u>. Provide a brief summary of the unavoidable impacts predicted to occur during construction. For example, this should be limited to the more significant impacts, such as modification of habitat for "important" species.
- <u>ESRP 10.2</u>. Provide a brief summary of irreversible and irretrievable commitments of terrestrial resources predicted to occur during construction. For example, this would include permanent loss of terrestrial habitat or loss of wetlands.

### Data and Information Needs

The type of data and information needed will be affected by site- and station-specific factors, and the degree of detail should be modified according to the anticipated magnitude of potential impacts. The following site and vicinity data or information (in addition to that listed in ESRP Section 2.4.1) should be obtained:

- a site map showing proposed buildings, the land to be cleared, waste disposal areas, the construction zone, and the site boundary (from the environmental report [ER] and ESRP 3.1)
- the proposed schedule of construction activities
- clearing methods; temporary and permanent erosion, runoff, and siltation control methods; dust suppression methods; and other construction practices for control or suppression specific to the site (from the ER)
- the total area of land to be disturbed (from the ER)
- the maximum area of soil to be exposed at any one time (from the ER)
- the area (hectares) of each plant community and habitat type to be cleared or disturbed (e.g., marshes, agricultural fields, and deciduous forests) and how much is being destroyed relative to the total amount present in the region (from the ER)
- the area to be covered by permanent station facilities, including new ponds and lakes (from the ER)
- the area to be used on a short term basis during construction, and plans for restoration of this land (from the ER)
- any proposed construction activity expected to impact "important" habitat (from the ER)
- documentation that the applicant has consulted with the appropriate Federal, State, regional, local, and affected Native American tribal agencies (e.g., as required by the U.S. Fish and Wildlife Coordination Act) (from the ER)
- identification of other Federal and State projects within the region that affect or could potentially affect the same threatened and endangered species (or their habitats) that occur on or near the site (from the ER)
- an estimate of the potential for bird collisions with cooling towers or other elevated construction equipment or plant structures (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies)

Additional background information about the terrestrial ecology of the site and vicinity, necessary for this review of impacts on terrestrial resources from construction, is requested in ESRP Section 2.4.1 and can be found in the ER, general literature, and from consultation with Federal, State, regional, local, and affected Native American tribal agencies.

The following data and information about transmission corridors and offsite areas should be obtained:

- clearing methods, erosion, runoff and siltation control methods (both temporary and permanent), dust suppression methods, and other construction practices for impact control or minimization specific to the proposed transmission system (from the ER).
- potential for bird collisions with transmission towers or lines (from the ER and consultation with Federal, State, regional, local, and affected Native American tribal agencies).

Additional background information about the terrestrial ecology of transmission corridors and offsite areas, necessary for this review of impacts to terrestrial resources from construction, is requested in ESRP 2.4.1 and can be found in the ER, general literature, and from consultation with Federal, State, regional, local, and affected Native American tribal agencies.

# II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of construction impacts on terrestrial ecology in the vicinity of the site and transmission corridors are based on the relevant requirements of the following:

- 10 CFR 51.71(d) with respect to including in the EIS information on impacts to the terrestrial environment due to construction
- Bald and Golden Eagle Protection Act with respect to the prohibition of taking, possessing, selling, transporting, importing, or exporting the bald or golden eagle, dead or alive, without a permit
- Coastal Zone Management Act with respect to natural resources, and land or water use of the coastal zone
- Endangered Species Act with respect to identifying impacts to threatened or endangered species and critical habitats by means of informal and/or formal consultations with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service
- Fish and Wildlife Coordination Act with respect to consideration of fish and wildlife resources and the planning of development projects that affect water resources
- Migratory Bird Treaty Act with respect to declaring that it is unlawful to take, import, export, possess, buy, sell, purchase, or barter any migratory bird. Feathers or other parts of nests or eggs,

and products made from migratory birds are also covered by the Act. "Take" is defined as pursuing, hunting, shooting, poisoning, wounding, killing, capturing, trapping, or collecting.

Regulatory positions and specific criteria necessary to meet the regulations and other statutory requirements identified above are as follows:

- Second Memorandum of Understanding and Policy Statement Regarding Implementation of Certain NRC and EPA Responsibilities, serves as the legal basis for NRC decisionmaking concerning licensing matters covered by NEPA and Section 511 of the Federal Water Pollution Control Act (FWPCA), commonly referred to as the Clean Water Act (CWA).
- Memorandum of Understanding between the Corps of Engineers, U.S. Army, and the NRC for the Regulation of Nuclear Power Plants, 40 FR 60115, provides guidance with respect to the NRC exercising the primary responsibility in conducting environmental reviews and in preparing EISs for nuclear power stations. However, the Corps of Engineers will participate with the NRC in the preparation of EISs by helping to draft material for sections covering (1) coastal erosion and other shoreline modifications, (2) siltation and sedimentation processes, (3) dredging activities and disposal of dredged materials, and (4) location of structures affecting navigable waters.
- Regulatory Guide 4.7, Rev. 2, *General Site Suitability for Nuclear Power Stations* (1998), contains guidance that the ecological systems and biota at potential sites and their environs should be sufficiently well known to allow reasonably certain predictions of impacts that there would be no unacceptable or unnecessary deleterious impacts on populations of important species or on ecological systems from the construction of a nuclear power station.
- Regulatory Guide 4.11, Rev. 1, *Terrestrial Environmental Studies for Nuclear Power Stations* (1977), contains technical information for the design and execution of terrestrial environmental studies, the results of which may be appropriate for inclusion in the applicant's ER. The reviewer should ensure that the appropriate results are included in the ER.

## Technical Rationale

The technical rationale for evaluating the applicant's potential construction or refurbishment impacts on terrestrial ecosystems is discussed in the following paragraph:

Construction of a nuclear power facility will directly impact the terrestrial environment. This section of the ESRP reviews and evaluates the impacts that are anticipated from the construction process. This information can then be used in other ESRPs to balance the environmental effects of construction of the proposed facility and the alternatives available for reducing or avoiding adverse environmental effects, as well as the environmental benefits of the proposed action. The acceptance criteria listed above should be used to ensure that the environmental impacts of the proposed action are considered with respect to matters covered by such standards and requirements.

### III. <u>REVIEW PROCEDURES</u>

When reviewing the impacts of station construction on the terrestrial ecology, the reviewer should take the following steps:

- (1) Review the general data and information necessary to determine the impacts on the terrestrial ecology from station construction:
  - (a) Identify the construction activities that impact "important" species and habitats of the site and vicinity, transmission corridors, and offsite areas (definition of "important" resources can be found in Table 2.4.1-1).
  - (b) Determine the areal extent and location of such potential impacts:
    - Prepare a map superimposing impact areas over resource areas.
    - During the site visit, inspect areas where construction activities will occur and inspect all other potentially impacted areas.
    - When necessary, supplement the data and information specified in the "Review Procedures" through consultations with Federal, State, regional, local, and affected Native American tribal agencies (e.g., the U.S. Fish and Wildlife Service and State wildlife agencies).
- (2) Review impacts of station construction on terrestrial ecology:
  - (a) Review and discuss the following impacts:
    - the number of hectares of plant community types preempted and the number of hectares modified by construction activities. Describe how construction activities will disturb the existing terrain and wildlife habitats.
    - Estimate the magnitude of the impact for important species that have commercial or recreational value. This may be expressed in terms of dollars, lost opportunity for recreational pursuits, percent reduction in harvest, percent loss of habitat, or other appropriate quantifiers.
    - Consult with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service under Section 7 of the Endangered Species Act, if threatened or endangered species or critical habitat are known to occur in the project area and the proposed project is predicted to add to their further endangerment.

- the impact of habitat modification (e.g., tree removal) on associated animal populations
- an evaluation of the impacts of construction on "important" species relative to effects on the local population and the total population of the species
- the effects of noise on "important" species
- construction activities that create obstacles to the movements of vertebrates or result in increased dispersal of invertebrate species known to be important as disease vectors or pests
- the potential for bird collisions with cooling towers, other elevated plant structures and construction equipment, transmission towers, and transmission lines
- changes in terrestrial habitat resulting from establishment of cooling ponds or lakes including the following:
  - construction activities that will dewater any wetlands, ponds, or seepages or alter surface drainage patterns supporting terrestrial biota
  - the adequacy of proposed plans for preventing soil erosion runoff to surface waters and revegetating disturbed soil
  - disposal of construction wastes that will need landfill or special disposal
- impacts to floodplains and wetlands on the power line right-of-way.
- (b) Become familiar with the provisions of standards, guides, and agreements that are pertinent to the construction of nuclear power stations:
  - Refer to the "Acceptance Criteria" section of this ESRP for a list of those that are applicable to this environmental review.
  - Consult with appropriate agencies, when necessary (e.g., the U.S. Fish and Wildlife Service and the State wildlife agency) to ensure compliance with the applicable regulations.
  - Analyze construction activities in light of recognized "good practice." The term "good practice" as used here will refer to those construction activities that tend to mitigate adverse environmental impacts.

## IV. EVALUATION FINDINGS

Input to the EIS should include (1) a list of adverse impacts of construction to terrestrial ecosystems, (2) a list of the impacts for which there are measures or controls to limit adverse impacts and the

associated measures and controls, (3) the applicant's commitments to limit these impacts, and (4) the staff's evaluation of the adequacy of the applicant's measures and controls to limit adverse impacts. This information should be summarized and provided to the reviewer of ESRP Section 4.6.

Any construction activity that should receive mitigative action should be described by the staff. Where mitigation is an option, the reviewer should evaluate appropriate measures, which could include alternative placement of structures, alternative schedules, or alternative construction practices. The reviewer should also evaluate alternatives for any proposed construction activity that is predicted to result in an adverse impact that cannot be mitigated. Practices proposed by the applicant for the protection of the environment should be described if the reviewer determines that they are necessary.

The depth and extent of the input to the EIS should be governed by the attributes of the terrestrial ecological resources that could be affected by plant construction and operation, and by the nature and magnitude of the expected impacts to those resources. However, the following should be evaluated for inclusion by the reviewer in the EIS:

- loss of habitat for endangered or threatened species in the context of guidelines under the Endangered Species Act of 1973. Where loss of habitat for commercially or recreationally important species occurs, the reviewer should consider the effects on the harvestable crop. It should generally be concluded that loss of up to 5 percent of such habitat in the site vicinity will have negligible impact on the crop and need no further analysis. Where losses exceed 5 percent, the reviewer should consider the loss in relation to regional abundance of these species.
- construction practices to minimize soil erosion and the number of hectares disturbed
- the clearing of vegetation from stream banks, making certain that it is limited to that necessary for placement of structures
- the CWA amendments of 1972, the Coastal Zone Management Act of 1972, and the Marine Protection, Research, and Sanctuaries Act of 1972. Guidelines under the Acts should be followed in evaluating the significance of dewatering wetlands. Because of the importance of wetlands, any unavoidable impact to this habitat must be considered in the overall benefit-cost balancing.
- the intrusion on or destruction of terrestrial plant communities that are regarded as representative of natural, undisturbed, or remnant communities or that show unusual ecological or geographical distributions, and the loss of fragile or sensitive habitat
- the proposed procedures for compliance with EPA guidelines for drainage from dredge spoil. Filling of biologically productive wetlands is generally to be avoided. Plans for dumping of dredge spoils must be approved by the EPA and the District Office of the Corps of Engineers.

- where cooling reservoirs are to be constructed, the potential beneficial impacts (e.g., provision of water for irrigation, livestock watering, or the creation of riparian habitat) and adverse impacts (e.g., the shortstopping of migratory waterfowl) should be considered and balanced against the ecological losses associated with inundation of the land area by the reservoir.
- the applicant's commitment to the use of good construction practices
- secondary impacts on wildlife, such as altered behavior resulting from construction noise, in addition to direct impacts on animals, such as loss of habitat and road kills
- the reviewer should screen each predicted impact using criteria appropriate to the impacted segment of the ecosystem. For example, loss of more than a few percent of the habitat available in the region for an "important" species could be considered of sufficient importance to consider mitigating action.

If the reviewer verifies that sufficient information has been provided in accordance with the requirements of this ESRP section, then the evaluation supports the following type of concluding statement to be included in the EIS:

The staff reviewed the available information relative to impacts to the terrestrial environment on or in the vicinity of the site. The staff concludes that the list and description of impacts is adequate to comply with 10 CFR 51.45.

### V. <u>IMPLEMENTATION</u>

The method described herein will be used by the staff in evaluating conformance with the Commission's regulations, except in those cases in which the applicant proposes an acceptable alternative for complying with specified portions of the regulations.

## VI. <u>REFERENCES</u>

10 CFR 51.45, "Environmental report."

10 CFR 51.71, "Draft environmental impact statement-contents."

Bald and Golden Eagle Protection Act of 1940, as amended, 16 USC 668 et. seq.

Coastal Zone Management Act, as amended, 16 USC 1451 et seq.

Endangered Species Act, as amended, 16 USC 1531 et seq.

Federal Water Pollution Control Act (FWPCA), as amended, 33 USC 1251 et seq. (also known as Clean Water Act).

Fish and Wildlife Coordination Act Amendment, 16 USC 661 et seq.

Marine Protection, Research, and Sanctuaries Act, as amended, 33 USC 1401 et seq.

"Memorandum of Understanding between the Corps of Engineers, U.S. Army, and the U.S. Nuclear Regulatory Commission for the Regulation of Nuclear Power Plants." 40 *Federal Register* 60115, August 25, 1975.

Migratory Bird Treaty Act, as amended, 16 USC 703 et seq.

"Second Memorandum of Understanding and Policy Statement Regarding Implementation of Certain NRC and EPA Responsibilities," 40 *Federal Register* 60115, December 31, 1975.

U.S. Nuclear Regulatory Commission (NRC). 1998. *General Site Suitability for Nuclear Power Stations*. Regulatory Guide 4.7, Rev. 2, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1977. *Terrestrial Environmental Studies for Nuclear Power Stations*. Regulatory Guide 4.11, Rev. 1, Washington, D.C.