

**DECISION NOTICE
AND
FINDING OF NO SIGNIFICANT IMPACT**

**SPRUCE AND PEATLAND RESPONSES UNDER CLIMATIC
AND ENVIRONMENTAL CHANGE EXPERIMENT (SPRUCE)**

**CHIPPEWA NATIONAL FOREST
MARCELL EXPERIMENTAL FOREST
ITASCA COUNTY, MINNESOTA**

I. SUMMARY

The U.S. Department of Energy (DOE) has completed an Environmental Assessment (EA) [DOE/EA-1764] for the Spruce and Peatland Responses Under Climatic and Environmental Change Experiment (SPRUCE). DOE and the U.S. Forest Service (USFS) propose to collaborate in research on the response and effects of elevated temperature and elevated atmospheric carbon dioxide (CO₂) on a black spruce-*Sphagnum* (peatmoss) ecosystem located in the Marcell Experimental Forest (MEF), which is located approximately 25 miles north of Grand Rapids, in Itasca County, Minnesota. The purpose of the proposed research is to obtain information on how this ecosystem would respond to a range of higher temperatures and increased atmospheric CO₂ that may occur in the future. Because this ecosystem plays an important role in carbon storage, its responses to these changes are likely to have important feedbacks on the atmosphere and climate through the global carbon cycle.

Experiments involving controlled manipulations of climate factors and atmospheric CO₂ concentration are needed to establish cause-and-effect relationships between climate changes and effects on ecosystems for a broad range of plausible future environmental conditions. Furthermore, quantitative information on ecosystem responses associated with climate change is needed to develop ecological forecasting tools for policy makers to evaluate safe levels of greenhouse gases in the atmosphere.

Based on the results of the analysis reported in the EA, DOE and the USFS have determined that the proposed action is not a major federal action that would significantly affect the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA) of 1969. Therefore, the preparation of an Environmental Impact Statement (EIS) is not necessary.

II. PUBLIC AVAILABILITY

The EA and Finding of No Significant Impact (FONSI) may be reviewed at and copies of the documents obtained from:

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

Chippewa National Forest
Deer River District
P.O. Box 308
1037 Division Street
Deer River, MN 56636

III. FURTHER INFORMATION ON THE NEPA PROCESS

For further information on the NEPA process, contact:

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NEPA Compliance Officer
U.S. Department of Energy
P.O. Box 2001, SE-32
Oak Ridge, TN 37831
Phone: (865) 576-0273

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P.O. Box 308
1037 Division Street
Deer River, MN 56636
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IV. PUBLIC PARTICIPATION

Opportunities for the public to provide comments regarding this proposed project were made available through the processes explained below:

- Scoping letters were sent to approximately 30 individuals and groups on May 13, 2010.
- A public meeting was held (EA Appendix A) on September 10, 2010.
- An advertisement was published in the *Western Itasca Review* newspaper of record on March 10, 2011, requesting comments on the proposed action, preliminary issues, and alternatives.
- Public notices were also placed in the *Grand Rapids Herald Review* and *Hibbing Tribune* on March 13, 2011.
- In addition this project was listed in the Chippewa National Forest Quarterly Schedule of Proposed Actions beginning with the April 2010 edition through May 2011.

Comments from the public, other agencies, and the Leech Lake Band of Ojibwe Division of Resource Management were received, and the responses to the comments are located in the project file.

The EA for this project was made available for 30-day public review and comment from March 10, 2011, through April 8, 2011. It was also sent to 51 people who either commented during the initial scoping period or requested a copy. One response was received. A summary of these comments and the USFS responses to them are in the Final SPRUCE EA (EA Appendix A).

V. DECISION

Per a review of public comments, consultation with District and Forest specialists, and a thorough review of the analysis, applicable laws, and the Forest Plan (FP), DOE and the USFS have decided to implement the proposed action as described in Sect. 2 of the EA. A brief description of the proposed action is provided below.

Activities at the SPRUCE site would include: (1) constructing and using temporary infrastructure to modify local temperatures and atmospheric CO₂ concentrations consistent with a range of climate change projections; (2) collecting field data regarding plant and animal growth and survival; (3) measuring changes in natural biogeochemical cycles of carbon, water, and other essential plant elements; and (4) evaluating air and soil temperatures, soil/peat water contents, and atmospheric humidity sufficient to characterize the nature of the experimental treatments.

Activities needed to support the proposed research would include extending utilities to the experimental site, installing multiple boardwalks above the surface of the experiment area, removing secondary growth trees in the experiment area to facilitate the installation of infrastructure, and installing experimental chambers. Material cleared from the upland area would be removed or left in the woods as a minor quantity of wood and slash. Experimental plots within the overall experiment site would be warmed and exposed to elevated CO₂ throughout the 10-year project duration.

Construction materials, CO₂, and propane supplies would be transported to the site by trucks using existing local roads. It is anticipated that some fencing would be installed around limited facilities to protect the public from on-site hazards, and a gated barrier would be installed at the entrance to each boardwalk. Electricity would be extended to the site from the south over a new, 3-mile distribution line corridor. The new line would be installed primarily along existing roads on USFS land. Construction work would take place predominantly in January, February, and March to avoid damaging the bog vegetation. Construction activities may take two winters to complete.

At project termination, the boardwalks would either be removed or left in place for USFS use; the aboveground enclosures would be disassembled and the materials recycled; the CO₂ and propane tanks and on-site trailers would be returned to the appropriate vendor or resold; and other experimental equipment would be reused, recycled, or discarded, as appropriate to the material. Some minor revegetation (e.g., reseeding) might occur in the disturbed upland areas once the infrastructure is removed. Any restoration of disturbed areas would follow the applicable USFS policies and procedures.

VI. RATIONALE FOR DECISION

DOE and the USFS have carefully read and considered the effects discussed in the EA, the Biological Evaluations, and the comments received during scoping and the 30-day comment period. Applicable laws, the FP, the USFS and U.S. Fish and Wildlife Service (FWS) Memorandum of Understanding (MOU) requirements on the Migratory Bird Treaty Act (MBTA) of 1918, and how well each alternative met the purpose and need for the project were also considered. The decision implements the Chippewa National Forest Plan. As required by the National Forest Management Act (NFMA) of 1976, Section 1604(i), this project has been found to be consistent with the Plan. The best available science was considered in making this decision. The project record demonstrates a thorough review of relevant scientific information; consideration of responsible opposing views; and, where appropriate, the acknowledgment of incomplete or unavailable information, scientific uncertainty, and risk.

DOE and the USFS are selecting the proposed action, to move toward the desired condition and management direction for the Experimental Forest Management Area in the 2004 FP (p. 3-33), and to meet the identified purpose and need (EA Sect. 1.1). Overall, the proposed action responds most favorably to the following elements defining the purpose and need for the SPRUCE project. It would:

- Actively study the results of higher temperatures and increased atmospheric CO₂ projected to occur in the future on boreal peatland forests.
- Likely result in information on atmosphere and climate through the global carbon cycle.

Tribal members may use the project area for hunting, recreation, and gathering activities even though the project is outside the Leech Lake Reservation. Maps compiled from oral interviews did not show any hunting/gathering areas within the project area. No site-specific concerns were raised from proposed activities (FP, S-TR-7, p. 2-36).

VII. SUMMARY OF ENVIRONMENTAL IMPACTS

The EA assessed the potential impacts of the proposed action and No Action Alternative on the following resources: land use, air quality, noise, geology and soils, water resources, biological resources, cultural resources, socioeconomics, infrastructure, hazardous materials and solid wastes, and safety. Potential cumulative impacts were also assessed.

The SPRUCE project would have minimal impacts on land use within the MEF because the MEF has been reserved for long-term research and the project site is located within one of the six designated experimental watersheds. The S1 watershed has also been previously disturbed for research activities. Construction of the experimental enclosures and associated infrastructure would change the existing visual character in the immediate vicinity of the site but would not be visible from nearby Cutaway Lake. Construction emissions and emissions from the experimental activities would not have a significant impact on the local and regional air quality and would not exceed any air quality thresholds. Greenhouse gas emissions from direct CO₂ releases and those from propane combustion combined would be approximately 1,615 metric tons. Thus, these emissions would have no more than a *de minimis* impact on the global atmosphere (EA Sect. 3.2.2.1).

Construction noise would cause a temporary and short-term increase to the ambient sound environment. Workers associated with construction activities would be expected to wear appropriate hearing protection. Noise would also be generated by the blowers on the experimental enclosures. No adverse impacts to workers would be expected as a result of construction and experimental noise, and due to the remote location and low anticipated noise levels, no impacts would occur to the public (EA Sect. 3.3.2.1).

Construction activities and the planned experiments would not have any impact on the underlying geology of the site. To minimize the potential for impacts and limit the potential for soil erosion, erosion prevention and sediment control management practices (e.g., silt fences, sediment ponds, erosion control matings and blankets, etc.) would be implemented as applicable. Vegetation clearing for the project would be limited to the minimum area required for construction of the project and disturbed areas would be revegetated with native species (EA Sect. 3.4.2.1).

Construction activities and experimental activities would affect the hydrology within portions of the S1 bog and wetland. None of the effects is expected to be of sufficient magnitude to cause impacts that affect the long-term survival, quality, or natural and beneficial values of the S1 bog wetland and surrounding hydrology. The affected portion of the wetland would recover in a few years (short-term effects) once the experiment is concluded and experimental structures are removed. Overall, any effects associated with these manipulations would be localized, and temporary. Upon completion of the experiment and removal of all associated equipment, wetland vegetation and hydrology would be expected to recover quickly. Approximately 500 to 550 ft of the wetland and stream area associated with the Cutaway Lake drainage would need to be crossed for the installation of the new electrical distribution line. Unidirectional boring would be used to minimize potential impacts (EA Sect. 3.5.2.1).

Construction activities would have minor, localized effects on plants and animals. Direct disturbance of vegetation in the S1 bog and adjacent upland aspen-birch habitat would total about 5 acres. This would include some harvesting of black spruce and aspen to construct the experimental enclosures and supporting infrastructure. Changes in plant community structure are expected from the drying of the surface peat layers in the heated enclosures. It is expected that vegetation in the bog would recover via natural revegetation once the experiment is complete. Some minor revegetation (e.g., reseeding) might occur in the disturbed upland areas once the infrastructure is removed. Any restoration of disturbed areas would follow the applicable USFS policies and procedures. No threatened, endangered, or sensitive (TES) species would be adversely affected by the SPRUCE project (EA Sect. 3.6.2.1)

The USFS evaluated the proposed SPRUCE site and the proposed electrical distribution corridor and determined that there are no traditional resource gathering areas that would be impacted by the proposed action and that the location is outside of the Leech Lake Band of Ojibwe Reservation. They also determined that no historic properties would be affected by the project (EA Sect. 3.7.2.1 and Appendix D).

The analysis assumed that the proposed action would create less than 10 direct, full-time equivalent jobs. Based on the small number of estimated jobs created, no impact on population would occur. Since no high and adverse human health impacts would occur as part of the proposed action, no such impacts to minority or low-income populations are expected (EA Sect. 3.8.2.1).

Electric power would be brought to the site over a new distribution line corridor that would primarily follow existing forest roads. Utility lines would be buried or placed in protected conduit at the ground surface as needed. Estimated electrical demand for the experimental activities would be approximately 8,700 kilowatt hours. Propane and CO₂ would be transported to and stored at the site in storage tanks. Anticipated use is around 7,000 gallons of propane per week. Vendors exist for the propane and CO₂, and supply should not be a problem. The proposed action would have a minimal effect on the roads in the vicinity of the project site. A short-term increase in vehicle traffic would occur during the construction period. Once experimental activities begin, routine access would be one to three persons daily. However, during heavy use in the summer months, the site might be occupied by as many as 10 to 20 persons daily. The short-term increase in traffic volume is considered to be within the existing transportation infrastructure's capacity and no adverse impacts would occur (EA Sect. 3.9.2.1).

Construction would result in the generation of a small amount of non-hazardous solid waste. Recyclable materials would be segregated from the waste. The remaining waste would be collected and stored on-site until it could be removed to a transfer station for disposal in the appropriate landfill. Small amounts of hazardous materials could be used and subsequent hazardous waste could be generated. If this occurs, all hazardous materials and waste would be handled, stored, transported, and disposed of according to all applicable MEF regulation and procedures (EA Sect. 3.10.2.1).

Implementation of the proposed action would slightly increase the short-term safety risk associated with the USFS and Oak Ridge National Laboratory (ORNL) personnel and any contractors involved in constructing, installing, and operating the various components of the SPRUCE experiment. No unique construction practices or materials would be required to construct the various parts of the project. All work activities conducted at the SPRUCE site would comply with specific environmental, safety, and health requirements established for this project and all applicable federal, state, and local regulatory requirements and standards for occupational safety and health, as well as the respective corporate requirements of each party. For members of the public, no unique or serious public health and safety hazards have been identified that would result from the operation of the SPRUCE project. It is expected that access to certain areas of the project site would be restricted and controlled through the use of fencing or other measures. Visitors to the site would be exposed to hazards that could cause slips, trips, and falls that are typically present at any public facility (EA Sect. 3.11.2.1).

VIII. OTHER ALTERNATIVES CONSIDERED

In addition to the proposed action, impacts were also evaluated for the No Action Alternative. Under the No Action Alternative, DOE would neither fund nor implement the experiment, and the USFS would not provide the experimental site. Thus, the S1 bog in the MEF would be available for other manipulative research by the USFS or other organizations. Also, the data and information expected to be obtained from the proposed research would not be available.

Alternative sites for the experiment were considered, but it was determined that locating the project at a different location would not materially change the potential for effects or the nature of those effects. Further, it was determined that undertaking the proposed research in the MEF would maximize the research results from the proposed research for the following reasons. The S1 watershed location on the MEF has the necessary combination of species and homogenous composition over sufficient land area, is a good example of a commonly occurring ombrotrophic bog, is accessible from pre-existing roadways, and is close to the necessary utilities and support organizations. The USFS has detailed records of hydrological, chemical, and meteorological measurements in the S1 bog and other closely related bogs on the MEF, extending from the 1960s to the present. Bogs of this type are very common in the region.

IX. FINDING OF NO SIGNIFICANT IMPACT (FONSI)

A. Context

This decision is consistent with the activities implemented by the Chippewa National Forest, which led toward achieving the goals, objectives, and requirements in the FP identified for the Experimental Forest Management Area (FP, pp. 3-32 through 3-34), while meeting the purpose and need of the EA. This project is tiered to the FP, and all of the expected impacts from this project are consistent with the expected impacts disclosed in the Final EIS for the FP.

B. Intensity

DOE and the USFS have determined the following with regard to the intensity of the project. Bold items are directly from 40 *Code of Federal Regulations (CFR)* 1508.27:

1. **Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes the effect will be beneficial.** The beneficial effects of the action do not bias the finding of no significant environmental effects. Impacts associated with the decision are discussed in Chap. 3 of the EA. The EA provides sufficient information to determine that this project will not have a significant impact (beneficial or adverse) on the land and its natural resources, air quality, or water quality.
2. **The degree to which the proposed action affects public health or safety.** For members of the public, no unique or serious public health and safety hazards have been identified that would result from the operation of the SPRUCE project (EA Sect. 3.11.2.1). Considering the effects disclosed in Chap. 3 of the EA, and the information contained in the project file, implementing the chosen alternative with mitigation would not significantly affect public health or safety.
3. **Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.** There are no parklands, prime farmlands, or wild and scenic rivers affected by the name of the project. In addition, the supporting documentation located in Chap. 3 of the EA and the project file provides sufficient information to determine that this project will not affect any known unique characteristics of the geographic area such as cultural resources (EA Sect. 3.7) or wetlands (EA Sect. 3.5).
4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.** The degree of controversy with regard to effects on the quality of the human environment are limited and considered not significant based on comments received during the scoping and the comment periods (EA Sect. 1.4, Appendices A and Project Record). Differing opinions do not indicate controversy.

5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.** Timber harvest, installing boardwalks, utility construction, and constructing and using temporary infrastructure have occurred previously on the Chippewa National Forest and MEF and other Experimental and National Forests. No impacts to the human environment that are highly uncertain, or involve unique or unknown risks, have been identified in this analysis.
6. **The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.** Timber harvest, installing boardwalks, utility construction, and constructing and using temporary infrastructure have occurred previously on the Chippewa National Forest and MEF and do not establish a precedent for future actions. The Chippewa National Forest Land and Resource Management Plan (RMP) allocates direction, objectives, standards, and guidelines that allow for such activities (EA Sect. 1.1).
7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.** There would be no significant cumulative effects as a result of this project beyond those discussed in the Chippewa National Forest Plan, and this action will not have a significant cumulative impact on the environment.
8. **The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.** A cultural resource inventory has been completed for this project. The Cultural Resources Report and EA disclosure (EA Sect. 3.7, Appendix D) Tribal Historic Preservation Office and State Historic Preservation Office consultation indicate that no properties eligible for, or listed on, the National Register of Historic Places are within the project's area of effect. The potential for impacting yet undiscovered sites is adequately mitigated in FP Standards. Based on this information, it has been concluded that this action will not cause loss or destruction of significant scientific, cultural, or historical resources.
9. **The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.** Based on the information disclosed in the EA (Sect. 3.6.1.2) and the Biological Evaluations, no adverse effects are anticipated as a result of implementing this decision. The FWS also concurred with the Biological Evaluation determinations that the project may affect, but will not likely adversely affect, the federally threatened Canada lynx (EA Sect. 3.6.1.4). A letter of concurrence from the FWS was received and dated March 29, 2010, as part of the Central Vegetation Management Project (EA p. 3-13).
10. **Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.** Laws imposed for the protection of the environment provided the framework for the Chippewa National Forest Plan. From the documentation provided in the EA, the project file, and Other Findings Required by Law (below), the proposed activities do not threaten a violation of federal, state, or local law imposed for the protection of the environment.

C. Finding

Based on the context and intensity of the environmental effects documented in the EA and after careful consideration of all public and agency comments, DOE and the USFS have determined that the proposed SPRUCE project does not constitute a major federal action that would significantly affect the quality of the human environment within the context of NEPA. Therefore, preparation of an EIS is not required.

X. OTHER FINDINGS REQUIRED BY LAW

The selected alternative will not have significant impacts on air and water quality, wetlands, soil resources, threatened and endangered species, or cultural resources. Therefore, this decision is in compliance with the Clean Air Act, the Clean Water Act, the Endangered Species Act, and the National Historic Preservation Act. It is consistent with the Executive Orders for Wetlands (11990), Floodplains (11988), Migratory Birds (13186), and Environmental Justice (12898) [EA Sect. 2.3 and Chap. 3].

Resource Protection: The proposed action will result in protection of TES species (EA Sect. 3.6.2). Mitigation measures and management requirements will aid in the protection of water and protection of cultural resources (EA Sect. 3.5.2, and Appendix B).

National Forest Management Act (16 U.S.C. 1600 et seq.)

All actions meet the NFMA requirements, including those for:

Consistency (16 USC 1604 (i)): The actions are consistent with the goals and direction stated in the 2004 FP (EA Sect. 1.1).

Vegetative Manipulation (16 USC 1604 (g)): The vegetation manipulation in the project area is consistent with the goals stated in the 2004 FP for the Experimental Forest Management Area [16 U.S.C. 1604 (g)]. The selected activities will provide the desired effects on water quality and quantity and wildlife.

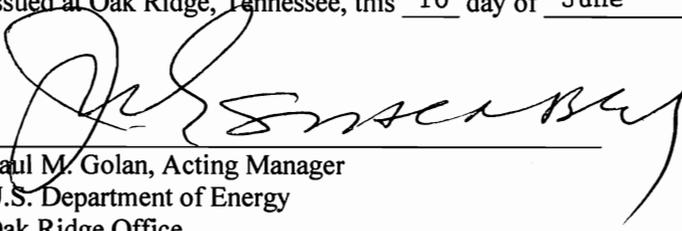
XI. APPEAL RIGHTS

This decision is not subject to administrative review (appeal) pursuant to 36 *CFR* 215.12 dated June 4, 2003. There was no expressed interest in the project or only supportive comments.

XII. IMPLEMENTATION OF DECISION

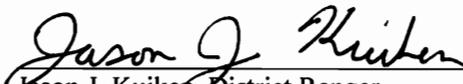
Implementation of this decision may occur immediately after publication of the decision legal notice (36 *CFR* 215.9).

Issued at Oak Ridge, Tennessee, this 10 day of June 2011.



Paul M. Golan, Acting Manager
U.S. Department of Energy
Oak Ridge Office

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Jason J. Kuiken, District Ranger
Chippewa National Forest
Deer River District