

to attach radio transmitters to captured bats for research purposes. Activities are proposed to further study roosting, foraging, and habitat utilization of the species for the purpose of survival and enhancement of the species in the wild.

Permit Number TE007350-1

Applicant: The Nature Conservancy, East Lansing, Michigan.

The applicant requests an amendment to existing permit number 840112 (new file number TE007350) for the endangered Mitchell's satyr (*Neonympha mitchellii mitchellii*) butterfly. The applicant proposes to complete the following activities which may take the Mitchell's satyr: (1) research and monitor the distribution and abundance of the species and quality of its habitat, (2) control invasive, non-native shrub and herbaceous species to manage/maintain suitable Mitchell's satyr habitat, and (3) to expand and restore habitat suitable for occupation by the species. Take (capture and release, handle, kill) is expected to occur in association with proposed activities. Proposed activities are for the enhancement of survival of the species in the wild.

Written data or comments should be submitted to the Regional Director, U.S. Fish and Wildlife Service, Ecological Services Operations, 1 Federal Drive, Fort Snelling, Minnesota 55111-4056, and must be received within 30 days of the date of this publication.

Documents and other information submitted with these applications are available for review by any party who submits a written request for a copy of such documents to the following office within 30 days of the date of publication of this notice: U.S. Fish and Wildlife Service, Ecological Services Operations, 1 Federal Drive, Fort Snelling, Minnesota 55111-4056. Telephone: (612/713-5343); FAX: (612/713-5292).

Dated: February 1, 1999.

T. J. Miller,

Acting Program Assistant Regional Director, Ecological Services, Region 3, Fort Snelling, Minnesota.

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DEPARTMENT OF THE INTERIOR

Geological Survey

Federal Geographic Data Committee (FGDC); Public Comment on the Proposal To Develop the "Content Standard for Digital Geospatial Metadata: Extensions for Remote Sensing Metadata" as a Federal Geographic Data Committee Standard

ACTION: Notice; request for comments.

SUMMARY: The FGDC is soliciting public comments on the proposal to develop a "Content Standard for Digital Geospatial Metadata: Extensions for Remote Sensing Metadata." If the proposal is approved, the standard will be developed following the FGDC standards development and approval process and will be considered for adoption by the FGDC.

In its assigned federal leadership role in the development of the National Spatial Data Infrastructure (NSDI), the Committee recognizes that FGDC standards must also meet the needs and recognize the views of State and local governments, academia, industry, and the public. The purpose of this notice is to solicit such views. The FGDC invites the community to review the proposal and comment on the objectives, scope, approach, and usability of the proposed standard; identify existing related standards; and indicate their interest in participating in the development of the standard.

DATES: Comments must be received on or before March 19, 1999. Comments are accepted at any time however the maintenance organization for this proposal has the authority to reject comments received after this date.

CONTACT AND ADDRESSES: Comments may be submitted via Internet mail or by submitting electronic copy on diskette. Send comments via Internet to: gdc-rsex@www.fgdc.gov. A soft copy version, on a 3.5 x 3.5 diskette in WordPerfect 5.0 or 6.0/6.1 format, along with one hardcopy version of the comments may be sent to the FGDC Secretariat (attn: Jennifer Fox) at U.S. Geological Survey, 590 National Center, 12201 Sunrise Valley Drive, Reston, Virginia, 20192.

SUPPLEMENTARY INFORMATION: Following is the complete proposal for the "Content Standard for Digital Geospatial Metadata: Extensions for Remote Sensing Metadata".

Project Title: Content Standard for Digital Geospatial Metadata: Extensions for Remote Sensing Metadata.

Data of Proposal: October 21, 1998.

Submitting Organization: FGDC Standards Working Group, Imagery subgroup (National Aeronautics and Space Administration (NASA)).

Point of Contact: Benjamin Kobler, NASA Goddard Space Flight Center, Mail Code 423, Greenbelt, MD 20771. Phone: 301-614-5231. Electronic mail: ben.kobler@gsfc.nasa.gov.

Objectives

The purpose of this proposal is to provide extensions to the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (also referred to hereafter as the Metadata Content Standard) for metadata describing geospatial data obtained from remote sensing. Efforts will be made to make these extensions consistent with the ISO metadata standard under development. Adding these extensions will provide a way to incorporate the metadata needed for remote sensing into the Metadata Content Standard.

Scope

These extensions will define content standards for metadata not defined in the Metadata Content Standard that are needed for describing data obtained from remote sensing. They will include metadata describing the observing geometry, the sensor, and the method and process of deriving geospatial information from raw telemetry. In addition, metadata to describe granules, the individual files or images that collectively make up a data product, will be defined.

Justification

Proper use of remote sensing data requires an understanding of how those data were obtained. While ground-based data are often compiled from existing data sources without change of form or are obtained by direct *in situ* measurement, deriving geospatial data from the measurements made by remote sensing instruments is often much less direct. To do so may require knowledge of the observing geometry, the instrument behavior, and the processing methods and history. In addition, remote sensing measurements produce large volumes of data, and users typically do not access the entire data set, only selected files or frames.

Information about the viewing geometry and the properties and behavior of the instrument in the FGDC Metadata Content Standard is limited to the description of the number of points along the raster axes. The draft ISO metadata standard also includes solar elevation and azimuth angles and the angle of an image to the vertical.

However, many users need a more detailed viewing geometry: satellite orbit or aircraft flight path, platform orientation, and orientation of instruments relative to the platform. While the proposed ISO standard includes a number of items in the section of spatial data representation describing instrumentation not present in the FGDC Metadata Content Standard, the only calibration information is whether camera calibration information is available. More information on the calibration of the instrument, including its dependence on wavelength and time, is usually required. A standard description of such metadata should be defined.

Processing of remote sensing data passes through several stages. The instrument calibration must be applied to the readings communicated by the raw telemetry and the resulting physical measurements located geographically. In some cases, what the instruments measure is not the final product; for example, radiation measurements may be used to infer temperatures. Maps and grids may be generated from data at individual points. Information on the algorithms used for these steps should accompany the data. In addition, information about the processing itself, such as what stage a given processing represents, or which version of processing is represented, is needed. The FGDC Metadata Content Standard allows for this information an entry for lineage, which the draft ISO standard has expanded this item to an entire section on lineage information, but in both cases the content is unspecified free text. These extensions will define the specific items that are needed in remote sensing metadata.

The dataset containing results from a remote sensing mission is large and heterogeneous. Necessary descriptive metadata may not apply to the entire dataset, but only to individual pictures or files. While the FGDC Metadata Content Standard has no specific provision for such granularity, the informative Appendix F to the ISO draft provides but does not define granule-specific metadata. These extensions will define the granule-level metadata appropriate to remote sensing.

Benefits

Adoption of these extensions will broaden the applicability of the Metadata Content Standard to include metadata needed to describe geospatial data derived from remote sensing.

Making this standard directly relevant to the remote sensing community will encourage its use. There will be less chance that future producers of remote sensing data will see the Metadata Content Standard as inapplicable to their needs and develop separate standards.

Approach

Data standardization and modeling are major research issues within the Earth Observing System Data and Information System (EOSDIS) development process. Results of this research, combined with comments from scientists around the world, from the EOSDIS Data Model Working Group, and from Earth Science Data and Information System (ESDIS) staff, have been developed into metadata for the EOSDIS Core System (ECS). There metadata are described in the Proposed ECS Core Metadata Standard. This document defines metadata in several areas in the scope of the extensions to be developed and will be used as a basis of the extensions covering those areas. The Moderate-Resolution Imaging Radiometer (MODIS) Level 1A Earth Location: Algorithm Theoretical Basis Document has a detailed discussion of the information and process required to derive positions in geographical coordinates given spacecraft and instrument position and orientation. That discussion will serve as the basis for the definition of viewing geometry metadata. As the proposed extensions are to be developed following FGDC prescriptions, development and adoption is to proceed through the FGDC Standards Working Group (SWG) procedures. The Imagery Subgroup will develop these extensions; working scientists with whom it is in contact will also contribute. Because both metadata and remote sensing applications are involved, the Metadata Ad Hoc Working Group should be involved at appropriate stages.

Related Standards

This standard is intended as extended elements of the FGDC Content Standard for Digital Geospatial Metadata. It will follow the prescriptions of Appendix D of that Standard, which specifies the requirements for extended elements. ISO/Technical Committee 211, Working Group 3 is developing an international standard for metadata; the current draft is ISO/CD 15046-15. When development of that standard is complete, it is likely to be considered for adoption by FGDC, superseding

those parts of the current standard where there is overlap. The ISO standard also has a recommended extension methodology, in Appendix E. The information there will be used to guide the process of development of these extensions to the metadata standard. Extensions to the current FGDC standard covering areas in the ISO standard not in the FGDC standard will be constructed to be compatible with the ISO standard.

As noted in the section on approach, the ECS Core Metadata Standard, which covers many of the areas in the scope of these extensions, will be used where relevant as a basis for the FGDC codification.

Schedule

Submission of proposal to FGDC/SWG: November 1998.

Submission of Working Draft to FGDC/SWG: late 1999.

Resources

NASA's ESDIS project will fund the effort required to develop these FGDC Content Standard for Digital Geospatial Metadata: Extensions for Remote Sensing Metadata.

Potential Participants

Through the Mission to Planet Earth, NASA already involves many diverse groups in the remote sensing community. The continuing standards work for ESDIS has provided considerable insight into the requirements of these groups. Other federal agencies that produce large quantities of remote sensing data, such as the National Oceanic and Atmospheric Administration, the National Imagery and Mapping Agency, and the U.S. Geological Survey, may also participate in development of the standard. Contributions will be solicited from the academic remote sensing community.

Target Authorization Body

The proposed extensions are not specifically targeted for consideration by any authorizing agency other than FGDC. However, as efforts to bring the FGDC standard into consistency with the ISO standard proceed, efforts may be made to gain ISO endorsement as well.

Dated: January 28, 1999.

Richard E. Witmer,

Chief, National Mapping Division.

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