Management and Access Guidelines for Institutional Scientific Collections USDA Forest Service

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History

In 2005, the White House's Office of Science and Technology Policy (OSTP) and Office of Management and Budget (OMB) made it a priority for agencies to "focus attention on integrated support and planning for the care and use of federally held scientific collections." In response, the Interagency Working Group on Scientific Collections (IWGSC) was formed under the Committee of Science of the National Science and Technology Council (NSTC). In 2008 the IWGSC issued the report "Scientific Collections: Mission-Critical Infrastructure for Federal Science Agencies," and made recommendations for improving the management, accessibility and impact of scientific collections owned by the federal government.

In 2010, a memorandum from OSTP, "Policy on Scientific Collections," directed the heads of executive departments and agencies to develop plans for: i) budgeting for collections, ii) ensuring best management practices for collections, and iii) making collections more accessible. [1] In 2014, OSTP issued another memorandum, "Improving the Management of and Access to Scientific Collections," directing federal agencies that own, maintain or otherwise financially support permanent scientific collections to develop a scientific collections management and access policy.[2]

This document is the Forest Service's response to that 2014 memorandum. It summarizes the policies and plans for management of scientific collections that are the responsibility of the Forest Service. These policy requirements were developed with input from the IWGSC to also comply with federal statutory requirements, including the America COMPETES Reauthorization Act of 2010 (Pub. Law No. 111-358).

The FS strives for transparency and accessibility to the scientific collections where appropriate and feasible. This document establishes the legislative, policy responsibilities and procedures for the management and access to FS scientific collections.

Philosophy of the Forest Service Regarding Scientific Collections

The Forest Service's philosophy regarding scientific collections is that like all publicly funded assets, scientific objects must be prudently managed and the agency must provide oversight of the inventory. Because these collections are produced or obtained in support of FS research, maintaining collections may be part of a FS staff's official duties. Unless restrictions for national and/or personal security apply, these objects are publicly owned and in the public domain. For this reason scientific collections are managed in the same way as permanent records of research or other government property. This includes formal notice to the Deputy Chief for that unit's Deputy Area if any change in the care, acquisition, transfer, or disposal of collections is proposed. If publications use specimens to support the findings, researches must place representative specimen in permanent collections where they will be maintained long-term. Each FS collection should be peer-reviewed every five years and is subject to fiscal

[1] Office of Science and Technology Policy, Memorandum for the Heads of Executive Departments and Agencies, Policy on Scientific Collections. (October 6, 2010).

[2] Office of Science and Technology Policy, Memorandum for the Heads of Executive Departments and Agencies, Improving the Management of and Access to Scientific Collections (March 20, 2014).

management planning, making each collection dependent on Congressional appropriations to the Forest Service for research and land use planning and management.

Definitions

Scientific Collections

For the purpose of this document, scientific collections are broadly defined as sets of physical objects, living or inanimate, and their supporting records and documentation, which are used in science and resource management and serve as long-term research assets that are preserved, catalogued, and managed by or supported by federal agencies for research, resource management, education, and other uses. These collections are created for the purpose of supporting or doing science or providing germplasm, rather than for their market value as collectibles and may include collections of historical, artistic, and cultural significance. The focus of this effort is not on specimens, or parts of specimens used temporarily, but rather on the institutional collections. These institutional collections document individual-based observations, that are considered an exhaustible resource, or those that will be consumed in the near future (e.g. seed collections for restorations). However, since all project or working research collections were obtained through public funding, are federal assets, and may be candidates for designation as institutional collections for long-term preservation, they must be cared for by means appropriate as a federal asset.

Institutional Collections[3]

If a collection does not meet the following criteria, it is not considered an institutional collection, and instead is a project collection not subject to these policy guidelines. Each institutional collection is:

- Subject to a formal accessioning procedure, including ensuring that there is adequate a documentation and the material is archived (e.g. notes, photographs, and maps);
- The responsibility of scientific collection curators or scientists and housed in facilities or parts of facilities devoted to long-term collection storage;
- Validated on a schedule determined by the Agency to ensure adequate management.
- Physically labeled in some way with catalog numbers or other unique identifiers linked to a corresponding record in a database or other record-keeping system;
- Routinely made available to all qualified users, with certain exceptions;
- Made available to qualified parties through formal loan procedures for research, education, or exhibition;
- Preserved long-term, except under certain infrequent conditions which may justify de-accessioning under a set of formal de-accessioning procedures.

Specimen Metadata[3]

Specimen metadata is information that describes a specimen that is part of a scientific collection. Generally, metadata make a specimen uniquely identifiable and more easily located in a search. Specimen metadata also often provide important scientific information about the specimen that may have its own research or education value. Examples of specimen metadata include:

[3] Certain nondisclosure provisions are contained in federal statutes that either require that matters be withheld from the public, or establish particular criteria for withholding material.

- Source specific information
- Phenotypic and genotypic scientific information
- Species identification
- Digital images of macroscopic specimens or cultures of microscopic specimens.

Specimen Record
A specimen record is composed of all metadata for a single specimen in a scientific collection.

Scientific Collection Database
- A scientific collection database is a listing or database of all records associated with collection activity including specimens, taxa, accessions, transfers, loans, borrow, inventory, physical location[3], collection manager(s), and other relevant information.

Scientific Collection Record[3]
- A record of a scientific collection, or a scientific collection record, is a descriptive guide to a scientific collection.
- The record contains essential information such as the title of the scientific collection, contact information, and the physical location of the specimens. Each scientific collection record is made available to the public via an online registry and points to the location of the associated scientific collection database.

Scientific Collection Registry
- A scientific collection registry is defined as an online digital repository that stores and makes publicly available the scientific collection records and, as appropriate, the scientific collections database associated with that record. The Smithsonian Institution has identified GRSciColl (http://www.GRSciColl.org) as an appropriated federal scientific collection registry. The FS has chosen to adopt GRSSciColl as its scientific collections registry to host scientific collection records, with the option to store scientific collections databases.

Purpose and Scope

The Forest Service strategic goals are to: 1) Sustain our nation's forests and grasslands; 2) Deliver benefits to the public by providing abundant and clear water, strengthening communities, and connecting people to the outdoors; and 3) Apply knowledge globally by advancing knowledge, transferring technology and applications, and exchanging natural resource expertise. Collections are often conducted on the 193 million acre National Forest System. The responsibility to advance and transfer knowledge is led by the Research and Development arm of the Forest Service.

The FS conducts research to develop and deliver knowledge and innovative technology, to reduce risk, and improve the health and use of the Nation's forests and rangelands in public and private lands. FS Research and Development (FS R&D) conducts research across all forest ownerships and across the landscape continuum, from wilderness to urban areas. FS R&D efforts provide scientific information and new technologies to support sustainable management of the Nation's forests and rangelands.

Scientific collections are essential to the mission of the Agency. These collections are an important part of the cumulative evidence base upon which science depends. They are composed of items acquired for study or reference. They support regulatory, management, and policy decisions and are used in research for biomedicine, global change, biodiversity, evolutionary biology, and other topics. These collections are distributed across the agency throughout the country. Increasingly they are used in interagency and international collaborations.

If these collections are to continue to support the needs of the Forest Service, they must be appropriately maintained or significant losses can occur. The FS strives to maintain transparency and to maximize public access to FS collections where feasible and appropriate. This document establishes the policy, responsibilities, and procedures for the management of and access to scientific collections. This policy applies to all current and future institutional scientific collections owned or managed by the FS.

Legislative and Regulatory Requirements and Authorities

The primary authorities directing or influencing the mission of the Forest Service are listed below.

1. **Forest Service Organic Administration Act** (Act of June 4, 1897) (16 U.S.C. §§ 473-475, 477+-482 and 551, June 4, 1897, as amended 1905, 1911, 1925, 1962, 1964, 1968, and 1976).
2. **Multiple-Use Sustained-Yield Act of 1960** (Act of June 12, 1960) (P.L. 86-517; 16 U.S.C. §§ 528-531).
3. Forest and Rangeland Renewable Resources Planning Act of 1974, P.L. 93-378 (August 17, 1974), as amended by the National Forest Management Act of 1976 (Act of October 22, 1976) (P.L. 94-588 ; 16 U.S.C. §§ 1600-1614, , as amended 1976, 1978, 1980, 1981, 1983, 1985, 1988 and 1990).
4. **Cooperative Forestry Assistance Act of 1978** (Act of July 1, 1978) (P.L. 95-313; 16 U.S.C. §§ 2101-2111, July 1, 1978, as amended 1990, 1991, 1992, 1996 and 2008).
5. **Forest and Rangeland Renewable Resources Research Act of 1978** (Act of June 5, 30, 1978) (P.L. 95-307, as amended by P.L. 100-521, Forest Ecosystems and Atmospheric Pollution Research Act of 1988, Section 3 (c), and as amended by P.L. 101-624, Food Agriculture, Conservation, and Trade Act of 1990 (1990 Farm Bill), Title XII, Subtitle B; 16 U.S.C. §§ 1641-1648
6. **Food Conservation and Energy Act of 2008** (2008 Farm Bill) (P.L. 110-234)
   - Title VIII - Forestry
     - Subtitle A: Amendment to the Cooperative Forestry Assistance Act of 1978-
     - Subtitle B: Cultural and Heritage Cooperation Authority-
   - Title IX - Energy
7. **Foreign Operation Appropriations Act of 1978** (Act of November 5, 1990) (P.L. 101-513, 104 Stat. 2070; 16 U.S.C. §§4501 note, 4501, 4502, 4503, 4503a to 4503d, 4504, 4505, 1641, 1643, 2101, 2109).
8. **National Environmental Policy Act** (Act of January 1, 1970) (P.L. 91-190; 42 U.S.C. §§ 4321-4347).
9. **Endangered Species Act** (Act of December 28, 1973) (16 USC §1531-36, 1538- 40).
10. **Foreign Operation Appropriations Act of 1978** (Act of November 5, 1990) 7. (P.L. 101-513, 104 Stat. 2070; 16 §§ U.S.C. 4501 note, 4501, 4502, 4503, 4503a to 4503d, 4504, 4505, 1641, 1643, 2101, 2109).
11. **16 U.S. Code**. Chapter 36 CFR Part 219. - FOREST AND RANGELAND RENEWABLE RESOURCES PLANNING
12. 36 CFR Parts 214, 261, 291 Paleontological Resources Preservation; Final Rule

Other Policies Specific to the Forest Service

The agency's **directives** consist of the Forest Service Manual[4] and Handbooks[5], which organize the agency's policies, practices, and procedures. The system serves as the primary basis for the internal management and control of all programs and the primary source of administrative direction to employees.[6] The text in the Manual and Handbook that pertain to scientific collections are provided in Appendix A.

The FS requires that all scientists get approval from the appropriate Forest Service administrator before getting State or Federal permits to collect flora and/or fauna in a Research Natural Area, to collect and deposit voucher specimens in a herbarium. There are additional requirements regarding rare and T&E species and paleontological collections. [7]

The line officers of each Research Station or Laboratory (Station Director), or NFS Region or other facility (Regional Forester) must appoint an individual or individuals to be in charge of archives. It is the responsibility of the lead investigator for research or team leader in management or assessment, to transfer all specimen to the archives during or at the completion of any study for which the specimens are collected[8]. Specimens are required to be archived after being properly preserved. Not all specimens, such as soil, water, plant parts and biological fluids cannot be retained for long periods of times, so these specimens must be kept until the person responsible for ensuring its quality determines that discarding the material will not affect the integrity of the study. Archiving can be done either in-house or contract archives. Archives must contain a specific reference to the location of the material stored off-site.[9] Specimens in the archive should be retained only for as long as quality assurance is verified, and should be disposed of after the line officer documents to the Station Director or Regional Forester that the information is no longer needed. Archived materials must be retrieved if a contract facility goes out of business.

RESPONSIBILITIES: ORGANIZATIONAL COMPONENTS AND AGENCY OFFICIALS THAT SUPPORT AND IMPLEMENT COLLECTIONS POLICY IN THE FOREST SERVICE

Administering the Scientific Collections

The Forest Service is the Nation's foremost Federal forestry organization, providing leadership in the management, protection, use, research, and stewardship of natural and cultural resources on the country's forests and grasslands. Due to the vast expanse and scattered nature of the lands administered by the Forest Service, this agency conducts inventory and monitoring on a case-by-case basis. When notice of a proposed land use is received, the agency determines whether the affected lands contain or have the potential to contain fossils or paleontological artifact. Depending on that analysis, a determination is made whether a field survey is necessary to locate these resources and, if necessary, and the survey locates these items, they may be collected, documented, and sent to a repository before or during a project. The information derived from these collections may influence management decisions on federal land.

In addition to the land management mission of the agency, there are corresponding Research Stations managing a network of research units, laboratories, and experimental forests and rangelands to conduct leading-edge research on all aspects of forestry, rangeland management, biological and physical sciences, socioeconomics, forest uses, and more. The Forest Service's research and development, technical assistance, technology transfer, and other services support natural resource management on the national forests, national grasslands, and on other lands.

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[4] (http://www.fs.fed.us/im/directives/dughtml/fsm.html)

[5] http://www.fs.fed.us/im/directives/dughtml/fsh_1.html

[6] http://www.fs.fed.us/about-agency/regulations-policies#sthash.woU9H1Xh.dpuf

[7] FSM 4000 – Research and Development, Chapter 4060 – Research Facilities and Areas.

[8] FSH 4090.13 – Good Laboratory Practices handbook, WO amendment 4090.13-93-1

[9] Section 73-(FSH 6209.11, sec 44)

Through intellectual inquiry and knowledge transfer, the Forest Service provides land managers and others with better information, applications, and tools for improved resource management and decision-making. By advancing the fundamental understanding of forests and grasslands, land managers and policymakers can make better informed decisions about forests and grasslands. FS R&D strives to improve the knowledge of complex environmental processes, biological and physical conditions, resource uses, human and social dimensions, the economic value of natural resources, and the interconnections among all these elements. Success in maintaining sustainable forests and grasslands far into the future depends to a large extent on the new knowledge, information, and applications developed by FS R&D. The Forest Service transfers of knowledge, technology, and applications will help the global natural resource community make better management decisions in our collective effort to care for all lands and deliver sustainable benefits to people.

For institutional collections, the Station Directors and Regional Foresters have the authority to make decisions on maintaining accessioning, and de-accessioning Forest Service scientific collections in their administrative area. For major decisions on accessioning, care and de-accessioning of entire collections or major subsets of collections, the issue should be brought to the attention of the Deputy Chiefs for R&D or the National Forest System.

Quality Assurance of Collections as Component of Programs

In 1993, two federal policy and regulatory requirements provided the impetus for improved performance accountability in the agency: The Government Performance and Results Act (GPRA), requiring all federal institutions to be accountable to Congress and U.S. taxpayers; and Executive Order 12682 to increase customer service standards.

To plan, implement, coordinate, and account for its work, the Forest Service uses Metrics Management. Tracking our activities through performance measures provides the Forest Service the opportunity to demonstrate our achievements. Performance accountability is an integral part of Forest Service operating standards, as it aligns projects and initiatives with long-term targets and strategic goals. Project plans are reviewed and updated throughout the fiscal year to reflect changed conditions, and accomplishments for key performance measures are used as part of the annual performance evaluations. This process provides concrete linkages between our strategic goals and our day-to-day activities. Metrics Management is a tool that allows for management of agency targets as well as performance measures and their metrics.

Forest Service Research and Development has three main levels of programmatic review that could include a review of the Scientific Collections.

1) Each year 20% of the Research Stations are reviewed. The Southern Research Station was reviewed in 2015 and the Pacific Southwest Research Station was reviewed in 2016.
2) Each year the programs of work for 20% of the Research Work Units are reviewed by the Research Stations that provide them oversight.
3) There are seven Strategic Program Areas: Wildland Fire and Fuels; Invasive Species; Outdoor Recreation; Water, Air and Soil; Inventory and Monitoring; Wildife and Fish; and Resource Management and Use. Each Strategic Program Area was reviewed between 2006 and 2009. There are no plans for subsequent reviews.

Main Collections

FS collections play a critical role in supporting FS research as well as research conducted by other institutions in North America and around the world. The value of FS collections is evident in the number of groundbreaking discoveries that have had a significant societal impact.

The main Forest Service Collections include:

- **The National Museum of the U.S. Forest Service**, founded in 1910 in Washington DC, is a major scientific collection that represents the efforts of hundreds of Forest Service employees over many decades. It is housed with the Rocky Mountain Herbarium on indefinite loan to the University of Wyoming, Laramie WY. FS specimens are intercalated with those of the Rocky Mountain Herbarium, and with over 120,000 accessions, it is rich in material from National Forests throughout the country. In addition, there are over 350,000 specimens currently under study or in backlog from recent work, bringing the total to more than 1.2 million plant and fungal specimens in the Rocky Mountain Herbarium.

- Some FS 'type' specimens (the specimen, or each of a set of specimens, on which the description and name of a new species is based) are housed at the Smithsonian Institution (US). This collection is an essential resource for education, research, and public service.

- The **Wood Collection at the Forest Products Lab in Madison WI (MADw)** contains approximately 45,000 specimens, 91% of which are hardwoods. This is the world's largest and best research wood collection with an extensive file of anatomical and properties data. The collection is used by many scientists throughout the world. As a public service, staff identify temperate and tropical wood samples for anyone who needs to know species, origin, and properties. They are considered the world's authority on wood identification.

- The **Center for Forest Mycology Research (CFMR) at the Forest Products Laboratory**, in Madison, WI, is a national repository for the collections of wood decay fungi collected by mycologists since the early 1900's. The collection is of 75,000 dried specimens of decay fungi. The Center also maintains a collection of more than 12,000 living cultures of wood decay fungi obtained from the herbarium samples before drying. These collections are a valuable resource for scientists involved in durability studies - an important aspect of housing research. The Reference Culture Collection at the Center for Forest Mycology Research is one of the largest assemblages of primarily Basidiomycetes fungi in the world.

- The **FS National Seed Laboratory (FSNSL)** in Georgia conserves natural genetic resources through long term seed storage for all native plants on National Forest System lands. The National Seed Laboratory assists with certification programs by serving as the designated authority from the United States to the Scheme for the Certification of Forest Reproductive Materials Moving in International Trade operated by the Organization for Economic Cooperation and Development. Assistance has also been provided to individual states as they develop or administer their tree and native plant seed certification programs. This collection ensures the preservation of genetic material in the event the existence of native US trees and other native plants in the wild are jeopardized.

- **The International Seed Bank** at the FSNSL serves as the National Seed Coordinating Center for the Exchange of Forest Tree Germplasm among countries participating in the Food and Agricultural Organization (FAO) of the United Nations. Laboratory personnel assist embassies and other agencies in locating tree seed and in avoiding duplication of effort in filling international requests. The Forest Service uses the ARS facility in Fort Collins as a backup for

the Forest service gene conservation collections. The ARS and FS have coordinated collections of species of common interest (e.g., ash).

Additional collections are continually being located and documented as part of the Forest Service collections.

SPECIFIC ROLES REGARDING INSTITUTIONAL SCIENTIFIC COLLECTIONS

Area Offices

FS Research Station Directors and Regional Foresters are responsible for the management of funds, personnel, and facilities available for the Agency's scientific collections in their units. Research or land management project leaders (or other representatives designated by a Station Director or Regional Forester) have responsibility for direct oversight of collection management in Units and are responsible for the management of funds, personnel, and facilities for managing those collections in their Stations or Regions.

Agency Oversight

The ultimate oversight of the institutional scientific collections are the responsibility of the Chief of the Forest Service. Information about each collections will be entered into the registry and will account to the Deputy Chief for the NFS about collections maintained on Regional Forests and their field units, and the Deputy Chief for R&D will account for collections maintained by Research Stations and their field units.

Staff

Lead investigators and team leaders are responsible for knowing and following best practices and standards for specimen-based documentation of their primary research findings and maintaining specimens or parts of specimens in a manner that would support their potential long-term transfer into and curation in an institutional collection. These staffs may fulfill a role as a collection curator if assigned by the Station Director or Regional Forester.

Collection Curators

Institutional collections will have a scientific collection curator, often a Project Leader or Lead Scientist, who is responsible for:

- Direction and planning of the scientific collection;
- Establishment of interagency agreements or contracts, if necessary;
- Establishment, review, submission, and revision of a Scientific Collection Plan, including Standard Operating Protocols (SOPs);
- Establishment of collecting priorities to guide the development of collections;
- Control, monitoring, and documentation of all access to and use of collections;
- Ensuring that the SOPs are stored in readily accessible but secure locations and available to personnel at all times;
- Ensuring that personnel review the SOPs, and associated trainings are offered and recorded;
- Compliance with this policy, SOPs, and the Scientific Collection Plan, and annual reporting on compliance;
- Delegation of authority and assignment of collection responsibility to the appropriate project staff; and,
- General scientific collection management and reporting.

GUIDELINES AND PROCEDURES FOR INSTITUTIONAL COLLECTIONS

Planning for an institutional collection should be done as part of developing Research Station or National Forest Plans during the typical 5-year project cycle, including external peer review coordinated by FS Research and Development if needed. Project Plans and their objectives are developed by the Regions or Stations in collaboration with curators and other scientists. The Forest Service recognizes that the scientists who are collecting the scientific objects, are best suited to propose plans for long-term preservation, maintenance, and accessibility of all scientific collections.

The part of the Research Station or National Forest Plan pertaining to the scientific collection should have an overall vision and protocols for the creation, expansion, long-term management, disposal, and accessibility and security of the scientific collection. The collections section of a Plan should include the following topics: Accessioning Plan, Maintenance Plan, De-accessioning Plan (if needed), Access Plan, Metadata Format, and if necessary the procedure for third party management of institutional scientific collections

1) Accession Plan The Forest Service acquires specimens by a variety of methods, including transfer and field collecting. The Agency recommends responsible, disciplined acquisition of collections, and the specimens within, through the following principles:

- The acquisition of collections should be relevant to the mission and goals of the Forest Service and individual laboratories;
- There should be clear delegation of collecting authority within laboratories to avoid duplication of efforts and mishandling; and,
- There should be strict adherence to all applicable laws and regulations relating to collections acquisition.
- As a general rule, collection items are acquired and accessioned only when there is a good faith intention to retain them in the Forest Service permanently or for the long-term. Institutional scientific collections are retained as long as they continue to serve the mission and objectives of the Agency, and can be properly maintained and used.

The Accession Plans provide the following information:

- Scope of specimens to be potentially included into an institutional collection
- The estimated yearly growth of the scientific collections.
- Accessioning protocols that provide:
    a. Procedure for transfer of custody of a specimen into the scientific collection
    b. Procedures used to process, handle, and store the specimen
    c. Procedure for the timely accession of the specimen:
    d. Standardized descriptive metadata into the record, including, but not limited to:
        i Accession or voucher number
        ii Physical location
        iii Accession date
        iv. Strain or species information
        v. Insertion of the record into the database/catalog
        vi. Assignment of physical storage space to the specimen

2) Maintenance Plans should have the following information:

- General information
    a. Name of collection, contact information, and operational division for the scientific collection curator
    b. Purpose of institutional scientific collection
    c. Date scientific collection was or will be established

d. Any applicable statute, regulations, or policy that must be observed during the ascession and management of specimens
e. Standards for consistent documentation of metadata
f. Infrastructure requirements
g. Data management plan (machine-readable, open format)

- Maintenance Protocols
  a. Procedures used to process, handle, maintain, track, ship, and share specimens
  b. Procedures used to store specimens in facilities devoted to long-term collection storage, including best practices for the long-term storage of institutional scientific collections
  c. Procedures used to inventory the collection to ensure accountability of the collection
  d. Procedures used to physically label specimens in some way with catalog numbers or other unique identifiers linked to the corresponding record in the institutional scientific collection database
  e. A document detailing policies for modifying or revising the SOP

3) De-Accessioning Plan. Consideration of appropriate de-accessioning and disposal should be part of the original research or land management project plan. Also, a schedule for the periodic review, evaluation, de-accessioning, and disposal of existing institutional scientific collections should be included to refine and improve the quality and relevance of collections with respect to the Forest Service's mission and purpose.

De-accessioning and disposal occur for a variety of reasons, such as unneeded duplication or redundancy of institutional scientific collection material; an insufficient relationship of collection items to the mission and goals of the Forest Service such that they are judged to be better placed elsewhere; and use in research that destroys the future use of the specimens.

A lasting archive of Forest Service research and the data, datasets, and voucher specimen objects that supported the research should be preserved indefinitely as resources allow. The decision to de-accession a specimen or a collection should be made only after careful review of the research, resource management, and educational value of a collection. Specimen objects and their associated data that form in part or in whole a scientific collection must go through review by the line officer before de-accession, transfer, or disposal. Consideration is given to how research objectives will be met in the absence of the scientific collection, the impact of the unfulfilled objectives of the National Research Program if not met, the financial consequences relating to the loss of the specimens, including potential costs of reacquisition, recollecting, or reproducing the specimen objects in the future, the loss of any potential Forest Service research products that could be generated from the specimen objects, and the impact on Forest Service staff and stakeholders at large as a result of reducing or losing access to the specimen objects either temporarily or permanently.

When either project or institutional collections are proposed for de-accession by a laboratory scientist or curator, the line officer is responsible for making sure that other (non-owner) Forest Service laboratories will be given an opportunity to accept ownership of the collection, except as otherwise stipulated by authorizing legislation or other restrictions. If, after the review process, the Forest Service determines that the specimen objects forming the collection will not be further supported in any Forest Service Program, then the priority is to seek another federal institution as a depository. Scientific collection curators should consult with researchers who have used the collection, parties interested in the collection's value for research, resource management, and educational purposes, and other subject matter experts, as needed. A public or private institution may become the depository if a federal institution is unavailable. Permanent destruction of specimen objects that have supported Forest Service research is the last option after pursuing all other options and the decision to destruct should be first approved by the responsible official. Collections, or specimens within, may be de-accessioned and destroyed only in

accordance with established authority of the designated scientific collection curator and only when consistent with applicable law

4) Notification, Review and Approval Notifications

Review and Approval of de-accessioning of an entire institutional scientific collection is submitted through the management chain of command, starting with the Research or management project leader. Once the leader approves the plan, it then proceeds to the Station Director for notification. The Deputy Chief for Research will also be notified about the impending de-accessioning of an institutional scientific collection before de-accessioning.

De-accessioning Plans should include:

1. A notice of scientific collection de-accessioning must contain the following information:
    a. Scientific collection curator and contact information
    b. Itemized list of specimens to be de-accessioned
    c. The disposition of the collection (e.g., transferred or destroyed)
    d. Transfer recipient, if applicable
    e. De-accessioning date
    f. Date of transfer or destruction
2. A final notification must be sent to the Chief once the entire institutional scientific collection has been either transferred or destroyed.
3. De-accessioning and Disposal Protocol, including:
    a. Guidelines for the decision to de-accession a specimen
    b. A procedure for the orderly transfer of specimens to a new collection
    c. The proper method of disposal of the specimen(s)

5) Access and Use Plan[3]

Specimens within a Forest Service scientific collection are the property of the United States Government. The Forest Service will provide reasonable physical access to its institutional scientific collections and metadata to qualified researchers, academics, and others as feasible, appropriate, and consistent with Agency mission and pursuant to the scientific collections Standard Operating Procedure (SOP) and federal regulations. Those seeking physical access to the institutional scientific collection or metadata must adhere to the procedures outlined in the collection's SOP.

Physical and digital access to the collections must be balanced against human resources, preservation, and security concerns. Scientific collection curators, working with their Unit Leader and Station Director or Regional Forester, will have the discretion to temporarily, or permanently, limit the access to institutional scientific collections and related catalogs, databases, records, and metadata for purposes of:

- Safeguarding individual privacy, confidentiality, trade secrets, copyright, and intellectual property rights;
- Adhering to laws, regulations, treaties, and international or tribal agreements;
- Protecting national security;
- Resource limitations;
- Specimen availability;
- Preservation constraints; or,
- Addressing general security concerns.

Any limits to public access to the institutional scientific collection must be disclosed in the Science Collection Plan and SOP including:

- Restrictions, and justification, for physical access to the scientific collection; and,

Redactions, and justification, for the digital access to the scientific collection.

Scientific collection databases, which include all specimen records and metadata, are made available to the public through GRSciColl (http://www.GRSciColl.org). A collection curator may also choose to separately provide public access to the scientific collection database online through another website, provided the scientific collection record in GRSciColl directs users to the location of the online database.

Access Plans include Access and Use Protocols:

1. Detailed instructions for digital access to the scientific collection, including:
    a. Step by step instructions and timelines for the process of providing digital public access to newly accessioned specimens
    b. A detailed description of which records or specimen metadata fields are restricted from disclosure and why (Certain nondisclosure provisions are contained in federal statutes that either require that matters be withheld from the public, or establish particular criteria for withholding material.)
    c. A timeline from accession of a specimen to digital public access
    d. A detailed description of which records and metadata to be redacted
2. Detailed instructions for physical access to the scientific collection, including:
    a. Outline procedures to properly aliquot, or parse, bio-specimens to ensure ease of distribution
    b. A detailed description of which specimens, records, and metadata will not be available for physical access
    c. Procedures used to respond to and accommodate physical access and loan requests
    d. A standard timeline to respond to a request

All restrictions on digital access shall be limited to the minimal subset of specific records and metadata as possible, with all other collection content made public. Where possible, redaction of specific metadata should be favored over limiting digital and physical access to the entire specimen or subset of specimens. Certain nondisclosure provisions are contained in federal statutes that either require that matters be withheld from the public, or establish particular criteria for withholding material.

Metadata format

When constructing and formatting the institutional scientific collection metadata, scientific collection curators must employ machine-readable and open formats, data standards, and common-core and extensible metadata for all new information creation and collection to facilitate search and discoverability and provide clear public guidance for accessing collections materials, consistent with the Executive Order on Making Open and Machine Readable the New Default for Government Information.

When available and where not limited by law, this policy, or resources, Forest Service will make freely and easily accessible to the public all digital metadata in the highest available fidelity and resolution, including, but not limited to photographs, videos, and associated records and documentation, that describe or characterize specimens in a scientific collection.

6) Third-Party Management of Institutional Scientific Collections

Third-party collections are those that are not owned, but are supported by, the Forest Service. To start a new third-party collection and, whenever practicable and appropriate, a scientific collection curator should work with public or private outside entities qualified to manage scientific collections. Those entities must agree to take responsibility for the stewardship and access to institutional scientific collections.

- If the outside entity is a federal agency, then the entity's scientific collection's policy applies to the institutional collection. An interagency agreement should be executed and included with a scientific collections plan (if available) and annual report.

- If the outside entity is not a federal agency, and does not have a relevant scientific collections management and access policy, then the institutional scientific collection will be governed by the Forest Service policy. All Agency grants, contracts, and cooperative agreements that direct an outside non-federal entity to obtain or create an institutional collection must require the entity to comply with the Forest Service scientific collections policy. The agreement or contract should be included with the scientific collection section of the annual report.

BUDGETING

An institutional collection is supported with Forest Service base-funding and is subject to Science Quality Reviews; thus, the collection's budget is part of the overall unit budget. Project budgets and their adequacy to support the research, including relevant institutional collections, are subject to yearly review by line management in the Agency's Annual Management Plan.

ANNUAL REPORTING

To maintain proper oversight of the management of institutional scientific collections, the scientific collection curator should submit an annual report summarizing the status of the collection as a component of the project annual report. The project annual report is reviewed and approved by the line officer of the Unit where the institutional collection resides. Subsequent approval by line management and review by program leaders are required per standard FS policies and procedures for project annual reports. The annual report for a project including an institutional collection must include:

- A link to the catalog in GRSciColl (http://www.GRSciColl.org)
- A summary of major changes to the digital or physical public access to the scientific collection;
- The current interagency agreement, memorandum of understanding, or contract with a third party entity responsible with the management of the scientific collection, if applicable;
- A summary of any significant changes in practices, procedures, technology, law, or regulation that impact the collection.

PRACTICES FOR SAFEGUARDING INDIVIDUAL PRIVACY, CONFIDENTIALITY, INTELLECTUAL PROPERTY RIGHTS, AND NATIONAL SECURITY

Privacy/Confidentiality

In most cases materials are broadly distributed from Forest Service collections without privacy or confidentiality restrictions. Nevertheless, certain circumstances require protection of confidential information. Confidentiality Agreements **(**CA) can be put into place to protect this information. A CA permits parties to exchange confidential information and data. The signatories of a CA agree to not disclose information received from the other party. A Material Transfer Agreement (MTA) is a type of confidentiality agreement that governs the transfer of certain kinds of materials between two organizations. The MTA does not transfer ownership – the materials are merely lent to the receiving organization and the MTA sets forth the conditions of the loan by defining the rights of the provider and recipient with respect to the materials and any derivatives, as well as the purposes to which the material may be put.

Intellectual Property

Outcomes of Forest Service research may require some form of intellectual property (IP) protection in order to attract the investment required to achieve successful utilization or adoption of scientific materials. Most protection of intellectual property in the Federal Government is done through patents. The first consideration in deciding whether or not to seek a patent is if protection will enhance the likelihood that the scientific materials will be utilized or adopted. Candidacy for intellectual property should be discussed with the Forest Service Patent Office.

Biosafety and Biosecurity[3]

To ensure safety and environmental protection, Forest Service employees are required to comply with all federal, state, and local regulations regarding the movement of pathogens (human, animal, and plant) within or into the United States, and safeguarding of those pathogens. Pathogens are distributed and transported only under authority of a permit (e.g., from the USDA Animal and Plant Health Inspection Service, the Department of Health and Human Services, or the Department of Commerce, as appropriate) and a Material Transfer Agreement permitting agencies to specify the level of containment for the pathogen as well as conditions for limiting access to pathogens and final disposal methods for pathogens. Acceptable disposal methods (usually autoclaving) for pathogens received under permit are specified in the permit. This is out of concern for protecting the Agency from liabilities as well as protecting the end-user/requester from potential harm/infection/contamination/etc.

APPENDIX A. Sections of the Forest Service Manual that pertain to scientific collections.

4063.33 - Scientific and Educational Use

Encourage the use of Research Natural Areas by responsible scientists and educators. Do not authorize educational use of the Research Natural Area if it is probable that such use will cause unacceptable impact on the values for which the Research Natural Area was established.

As with all Research and Development proposals (FSM 4070), all proposals for research in Research Natural Areas must be approved by the Station Director. Scientists interested in using a Research Natural Area must provide the appropriate Station Director with a description of the research activity planned. With respect to non-Forest Service scientists, Station Directors have the authority to approve study plans proposed by non-Forest Service scientists and execute cooperative agreements, where appropriate. The scientist must provide the Station Director and Regional Forester with copies of all data, reports, and publications resulting from the research including theses, dissertations, articles, monographs, and so forth. The final report on the results of the research project shall be submitted to the Forest Service no later than 1 year following completion of the research.

Access to a Research Natural Area by parties external to the Forest Service may be authorized and approved by the District Ranger and shall conform to conditions specified in approved study plans and/or cooperative agreements. For direction on research in wilderness areas, see FSM 2323.

Forest Service scientists shall cooperate in research conducted by non-Forest Service scientists, whenever possible, to keep informed as to the nature and progress of the work and to ensure that Research Natural Area values are maintained. Scientists conducting research on a Research Natural Area must file copies of all research data, reports, and other pertinent documents with the Station, Region, and Forest.

All scientists conducting investigations which involve the collection of flora and/or fauna in a Research Natural Area must, as a condition of approval by the Station Director (or Regional Forester in congressionally designated areas (FSM 4063.05)) to use the area:

1. Obtain appropriate permits from State and Federal agencies.
2. Control collection of all species carefully, especially those that are endangered, Threatened, or rare plants
3. Collect and deposit voucher samples of plants in a herbarium.

4083.1 - Support Services

The policy is to provide adequate support services at each Station and Research Project Location for the proper conduct of the research program. The Assistant Director for Support Services is responsible for providing or facilitating these services.

1. Scientific Support. Scientific support is given by providing: library services to store and retrieve information and to aid in bibliographic searches; publication services to communicate research results in proper form; biometrics or statistical services to ensure appropriate experimental design and the use of efficient statistical and systems models; and engineering services to ensure adequate laboratory facilities.

2. Technical Support. Technical support is given by providing: specialized work areas, such as laboratories, Experimental Forests and Ranges, and repair shops (including their maintenance); trained laboratory and field technicians; computing and data processing services; information dissemination and visual aids; and technical clerical services.

3. Administrative Support. Administrative support is given by providing: personnel services; financial management and legal consulting; and administrative services to ensure effective procurement and supply, and to provide office equipment, transportation facilities, and records management.

4083.2 - Identification

Insects and mites are identified by Station experts or submitted to specialists as indicated in FSM 4083.21. Fungi are identified by Station experts or submitted to the Center for Forest Mycology Research as indicated in FSM 4083.22.

4083.21 - Insects and Mites

Station entomologists may provide limited services for identifying insects collected within Station boundaries. If these experts are unable to provide identifications, the Project Leader should submit the unidentified material to: Taxonomic Services Unit, Insect Identification and Beneficial Insect Introduction Institute (IIBIII), Building 003, Room 1, Beltsville Agricultural Research Center-West, Beltsville, Maryland 20705.

Users of identification services at IIBIII and other institutions should cite the responsible identifier in their publications and reports. If the name of the identifier cannot be given after the name of the taxon, such as in tables or lists, use a footnote or other means of acknowledgment.

The proper format, as appropriate, follows:

- Name of identifier, Systematic Entomology Laboratory, Agricultural Research Service, U.S. Department of Agriculture.
- Name of identifier, Department of Entomology, Smithsonian Institution.
- List cooperating entomologists at other institutions in a similar format.
- Send reprints of publications and other documents that contain IIBIII identifications to the Director, IIBIII, and to the identifier.
- Organize and prepare shipments according to IIBIII guidelines to help specialists identify specimens more quickly.

Do not send parasitic Hymenoptera that have been reared from unidentified hosts to IIBIII without approval of the Director, IIBIII, unless the hosts are also sent to IIBIII for identification. To decide whether to accept non-reared, host-indefinite, or non-U.S.A.-related parasitic Hymenoptera, the Institute must know the specific nature of the research being conducted and the relationship of that research to the material in question.

Include with each shipment submitted to the IIBIII, Form NER-625, Identifications Request, for each lot. Obtain the forms and instructions, Form NER-625A, from IIBIII. Label the specimens with the following information: specific locality (nearest post office; county; State; section, township, and range, if known); collector's name; date of collection; name of host (host plant for phytophagous insects, host insect for parasites, other host associations, when known); and voucher number (if appropriate).

If available, include 10-20 or more preserved insect specimens of each species sent for identification; when possible, include both sexes. Submit the immature stages of reared adults, if available; if not, even the cast skins of these stages can assist in identification.

Insect shipments require special handling to prevent damage to specimens during shipment. The Bulletin of the Entomological Society of America, Volume 22, Page 130, provides guidelines.

4083.22 - Diseases

Station pathologists may provide limited identification services for diseases and decay fungi from forest trees and range shrubs collected within Station boundaries. If these experts cannot identify the specimens or cultures, the Project Leader should send them for identification or classification to the Center for Forest Mycology Research at the Forest Products Laboratory. If the specimens cannot be identified by mycologists at the Center, the Center Leader will refer the specimens to other taxonomists specializing in particular groups of fungi in other Federal, State, university, or foreign organizations where they have cooperative relationships.

Notify the Center for Forest Mycology Research and obtain approval to send specimens. The Center Leader shall specify how to package the material for shipment to avoid deterioration of the samples.

The shipper shall ensure that no domestic or foreign quarantine laws, or any other laws regulating the movement of such materials, are violated (FSM 4083.23).

Project Leaders should send only specimen material typical of its class, mature, and possessed of all features and characteristics of taxonomic significance. Include descriptive matter with date and place of collection, collector's name, locally assigned number or their identifying symbol, visual dimensions and colors at time of collection, specific host and part thereof on which found, relative abundance, and brief notes on pertinent environmental factors.

Send recently isolated or transferred cultures only. Allow a sufficient period of growth prior to shipment, to verify their freedom from contaminants, and their establishment and active growth on the substrate.

4083.23 - Shipment of Living Organisms

Shipment of living organisms is controlled by Federal law, and by State law in some states, to prevent distribution of pests to new areas. The receiver shall obtain the necessary permits and labels, and provide them to the shipper. Do not ship living organisms without prior approval, and include a shipping permit in every shipment.

Persons expecting to receive living beneficial organisms, plant pests, pathogens, or disease vectors should apply for a permit at least 30 days before the expected shipment date. Obtain the necessary regulations and forms from the Biological Assessment Support Staff, National Program Planning Staff, Animal and Plant Health Inspection Service, USDA, Federal Building, Room 633, Hyattsville, Maryland 20782, or from State regulatory officials. Ask for Plant Protection and Quarantine Form 526, Application and Permit to Move Live Plant Pests and Noxious Weeds.

The following references provide guidelines on importation and movement of living organisms: (1) Boldt, P.E.; Drea, J.J. packaging and shipping beneficial insects for biological control. Plant Protection Bulletin 28: 64-71; 1980. (2) Klingman, Dayton L.; Coulson, Jack R.; Guidelines for introducing foreign organisms into the United States for the biological control of weeds. Bulletin of Entomological Society of America 29: 55-61: 1983.

Introduction or redistribution of beneficial biological organisms (insects or pathogens) is not now regulated. Forest Service personnel involved in research or use of beneficial biological organisms (insects or pathogens) should document introduction, redistribution, and release of living materials on the

following forms: AD-941, Biological Shipment Record-- Foreign/ Overseas Source; AD-942, Biological Shipment Record--Quarantine Facility; AD-943, Biological Shipment Record--Non-quarantine. Contact the Insect Identification and Beneficial Insect Introduction Institute, Beneficial Insect Introduction Laboratory (Biological Control Documentation Center), Beltsville, Maryland 20705, for instructions on their use. Use Form AD-14, Request for Supplies, Forms and/or Publications, to request additional copies of these forms.

4083.3 - Forest Service Tree and Range Plant Name Committee

This Committee sponsors the preparation of checklists of the trees of the United States. The chief duties are to provide uniform usage of common names of forest trees and range plants in the Forest Service.

Questions about common names of trees and range plants, as well as proposed changes, may be submitted to the Chairperson, Tree and Range Plant Name Committee, U.S. Forest Service, Washington, D.C. 20250.

4090.13 CHAPTER 70 - RECORDS, REPORTS, AND ARCHIVING

70.4 - Responsibility.

70.41 - Line Officers. The line officers of each Station, laboratory, or other facility must appoint an individual to be in charge of the archives.

70.42 - Study Director. It is the responsibility of the Study Director to transfer all raw data, documentation, protocols, specimens, and final reports to the archives during or at the completion of the study.

71 - REPORTING STUDY RESULTS. (Sec. 01, ex. 01; Title 40 CFR 160.185).

71.4 - Retention. The testing facility and sponsor must retain a copy of the final report, including any amendments, for the time period specified in FSH 6209.11.

72 - ARCHIVING. (Sec. 01, ex. 01; 40 CFR 160.190 and 160.195). Ensure that all raw data, specimens, and reports associated with a study are archived. Inspectors from the U.S. Environmental Protection Agency should examine the archives during each inspection. Use care to ensure that all study materials and information are saved and properly preserved (sec. 73).

72.05 - Definitions.

72.1 - Materials to be maintained. Store all raw data produced during a study in their original form except where copies are specifically required. If copies are used, state the location of the original records. Apply these requirements to all laboratory worksheets, records, notes, memoranda, magnetic media, microfilm, microfiche, photographs, software, videotapes, computer printouts, and instrument outputs. Data that are stored in computers should be archived in hard copy form to prevent the loss of information due to computer problems and to guarantee that raw data can be retrieved from outdated hardware and software systems. Outmoded versions of software should also be kept if data are stored electronically. Data stored on magnetic tape should be transferred to fresh magnetic tape every 2 years to prevent loss due to deterioration of the tape. Password protection is not sufficient to ensure the integrity of raw data stored electronically. Use "read only" programs that allow data to be accessed but not altered.

Retain all documentation; records; protocols; specimens; samples of test, control, and reference substances; and the final report generated during a study. This includes all correspondence and documents concerning the interpretation and evaluation of data, even if such information is not included in the final report.

Archive this information for all test substances in a study, even if only one compound is eventually registered. Archive all records and reports on equipment calibration, maintenance, and inspection. Records at test facilities may be kept as originals, photocopies, microfilm, microfiche, or other accurate methods of reproduction. Write the statement "Exact copy of original data" on all copies. Do not destroy original copies. The purpose of copies is to provide on-site records and to ensure the integrity of degradable media records. It is the responsibility of the applicant to keep the original records.

Certain types of specimens, such as soil, water, plant parts, and biological fluids, cannot be retained for long periods of time due to their fragile nature and rapid rate of decomposition. Keep such specimens until the Quality Assurance Unit (QAU) determines that discarding the material does not affect the integrity of the study (sec. 80.44).

The QAU must keep copies of the current master schedule, the protocols, and the records of quality assurance inspections for the time periods specified in section 73.1. Retain summaries of training, experience, and job descriptions for the time periods specified (sec. 73.1).

72.2 - Facilities. Certain conditions must be met to fulfill archiving requirements. Conditions of storage must be adequate to minimize deterioration or chance of loss. It may be necessary to separate reports and written information from samples and chemicals. Each archive area must be provided with adequate security, including fire prevention, pest control, and an evacuation plan. Each test, control, and reference standard must be stored properly (FSH 2109.12, Ch. 10).

The archives must be indexed to allow orderly storage and expedient removal of the documents and specimens. Materials can be checked out of the archives on a limited basis. However, it is recommended that these materials not be removed from the archives. Access to the archives must be limited and restricted to authorized personnel.

72.3 - Archiving Methods. Archiving can become an expensive requirement if a large number of studies are being conducted under Good Laboratory Practice regulations. Field units have several options: in-house archives and contract archives.

72.31 - In-house Archives. A station or other facility with a small number of Good Laboratory Practice (GLP) studies should normally not need an extensive archiving facility. A locked file cabinet can serve as an archive under these conditions. More extensive archiving facilities are required if a larger number of GLP studies are being conducted. In this case, archives should be in a separate room or rooms with restricted access.

72.32 - Contract Archives. The field unit can contract its archiving responsibilities. Commercial archives can serve as a repository for storage of all required materials. Alternatively, the field unit can store final reports and other paperwork in its archives and contract for storage of specimens and chemicals. In this case, the archives of the field unit must contain a specific reference to the location of the material stored off-site.

72.4 - Archiving Subcontracted Material. At the termination of a study, the Study Director should retrieve all raw data and reports, or exact copies, produced by independent consulting laboratories,

grantees, or other contractors involved with the study. This material should be stored in either Forest Service in-house or contracted archives.

73 - RETENTION OF SPECIMENS AND RECORDS. (FSH 6209.11, sec. 44).

73.1 - Duration.

73.11 - Fragile Specimens. Retain wet specimens, samples of test, control, or reference substances, and specially prepared, fragile specimens that deteriorate with time only for as long as their quality allows evaluation. Ensure quality assurance verification is obtained before any material is discarded (sec. 80.44).

73.12 - All Other Materials. Retain all materials, other than fragile specimens, for the time periods set forth in FSH 6209.11, section 44.

73.2 - Elimination of Requirement. Material need not be archived after the Forest Service receives written notification from the U.S. Environmental Protection Agency that the information is no longer required. This may occur after a facility inspection and data audit. See FSH 6209.11, section 44 for direction on the disposition of records. However, most private companies prefer to retain the information in their archives in case of legal challenges.

73.3 - Transfer of Archives. If a contract laboratory or archiving facility goes out of business, retrieve any raw data or other materials stored by the facility and place them in the unit's archives or at another contract facility. Notify the U.S. Environmental Protection Agency in writing of this transfer.