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Revision 0
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Hanford Site Biological Resources Management Plan

August 2001



**United States
Department of Energy**

Richland, Washington

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Executive Summary



Executive Summary

S.1 Introduction

As a federal land manager, the U.S. Department of Energy (DOE) is responsible through its Richland Operations Office (DOE-RL) for conserving fish, wildlife, and plant populations and their habitats on the Hanford Site. The DOE-RL currently manages impacts to threatened and endangered species through a number of separate initiatives, but no previous management strategy has considered the overall health of the entire Hanford ecosystem. To fill this management void, a comprehensive plan was needed that viewed Hanford’s biological resources and their management from both site- and program-wide perspectives.

The *Hanford Site Biological Resources Management Plan* (BRMaP) was developed to meet this need. The plan provides DOE-RL and its contractors with a consistent approach to protect biological resources and monitor, assess, and mitigate impacts to them from site development and environmental cleanup and restoration activities. Approaches to better manage

total resources also are provided in the plan. The BRMaP’s primary purposes are to support DOE-RL’s environmental cleanup and other Hanford missions; provide a mechanism for ensuring compliance with laws that relate to the management of potential impacts to biological resources; provide a framework for ensuring appropriate biological resource goals, objectives, and tools are in place to make DOE-RL an effective steward of Hanford’s biological resources; and implement an ecosystem management approach for biological resources on the Site.

As a comprehensive plan, BRMaP provides a framework to enable Hanford Site resource professionals to effectively fulfill their responsibilities and address Tribal, resource agency, and other stakeholder concerns about the Site’s biological resources. The plan strongly emphasizes the benefits of good up-front planning for mitigation and restoration at Hanford.

Figure S.1 identifies essential aspects of Hanford biological resource management, which include resource monitoring, impact assessment, mitigation,

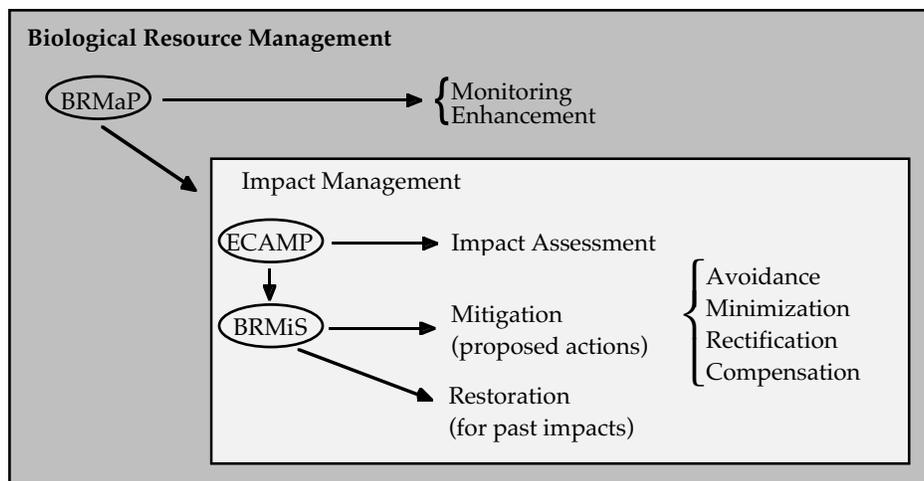


Figure S.1 Relationship of Biological Resource Management Actions to Appropriate DOE-RL Guidance Documents

and restoration. The figure shows management actions and their relationship to the appropriate DOE-RL guidance documents, including the BRMaP, *Ecological Compliance Assessment Management Plan* (ECAMP) (DOE-RL 1995), and *Biological Resources Mitigation Strategy* (BRMiS) (DOE-RL 1996). The general relationship of BRMaP to these two subtier documents is that of a strategy and guidance document to an implementation document. BRMaP provides general but comprehensive direction that specifies DOE-RL's biological resource management policies, goals, and objectives and prescribes how they may be met. The subtier documents outline specific management actions necessary to meet various policies, goals, and objectives. The BRMaP also shares an important relationship with the *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS)* (DOE 1999). The land-use plan integrates appropriate biological resource data and biological resources management strategies from BRMaP with other components dealing with environmental, cultural, economic, and sociopolitical elements to implement an ecosystem management approach to land-use planning at the Hanford Site.

S.2 Biological Resource Management at Hanford

The policies and guidelines described in BRMaP were developed based on legal requirements and policy initiatives that direct an ecosystem management approach toward resource management.

Development of BRMaP is consistent with Secretary of Energy policy, which promotes an ecosystem management approach to resource stewardship, and with resource management plans developed at other DOE sites. In support of the policy, DOE-RL developed the following broad biological resources protection policy:

It is the policy of the U.S. Department of Energy, Richland Operations Office to act as a responsible steward of the environment. This stewardship will be based on the principles of ecosystem management and sustainable development.

The box outlines DOE-RL's specific policies for biological resources management at Hanford.

DOE-RL Biological Resources Management Policies

DOE-RL will:

- act to preserve and enhance the biological resources under its stewardship as valuable national resources
- ensure biological resource values are considered by all programs in all actions conducted on DOE-RL's behalf consistent with applicable treaties, laws, regulations, and obligations as a natural resource trustee
- endeavor to enhance throughout the Hanford complex an awareness of and appreciation for biological resource values and their preservation, restoration, and enhancement
- integrate biological resource management goals and administrative procedures into relevant program- and project-level activities to ensure potential adverse impacts to biological resources are avoided or minimized
- integrate biological resource information into land and facility use plans to ensure broad-scale land use planning and specific site selection decisions consider biological resource values, apply ecosystem management principles, and minimize cumulative impacts to biological resources
- incorporate ecosystem management principles and tools into the program (project) planning process to facilitate meeting biological resource management goals and objectives while minimizing impacts to program (project) budgets and schedules
- adopt recommendations of the Council on Environmental Quality to incorporate biodiversity considerations into environmental impact analysis under NEPA (CEQ 1993)
- mitigate, as necessary, adverse impacts to biological resources that may result from current and future Hanford activities in a manner commensurate with the value of the resource and the severity of the impact
- as the Lead Response Agency at Hanford under the National Contingency Plan, conduct response activities (i.e., removal or remedial actions) cost effectively that avoid or minimize adverse impacts to biological resources
- cooperate with federal, Tribal, and state resource agencies to ensure a cost-effective yet adequate information baseline on resource status is maintained for Hanford's biological resources within a bioregional context
- coordinate with other governmental agencies and stakeholders, as applicable, on biological resource management issues in an open and cooperative manner.

S.3 Roles and Responsibilities

Figure S.2 shows overall roles and responsibilities for implementing BRMaP. Although ultimate decisions for managing Hanford's biological resources are vested with the manager, Richland Operations Office, the Office of Site Services plays a key role in developing such policy and in overseeing the plan's implementation across the Site. A Natural Resources Working Group provides implementation assistance.

The BRMaP is guidance that applies to DOE-RL unless there is a management decision not to apply it. This plan will not have a retrospective effect. In determining how to apply this plan, DOE-RL will consider whether resources have been irreversible and irretrievable (I&I) committed. The BRMaP applies to all DOE-RL programs at all locations within DOE-RL's administrative control. It may apply to DOE-RL contractors and permit or lease holders through those contractual documents. Existing contracts, permits, and leases may be modified, as necessary, to meet the management objectives of this plan. The BRMaP does not create any right, benefit, or trust responsibility, substantive or procedural, enforceable against the United States, its agencies, officers, or any person.

The BRMaP will be reviewed at least every 2 years to ensure it meets DOE-RL's biological resource management needs. The plan will be updated, as needed, when the status of particular resources change or management prescriptions are modified in response to new findings. This version of BRMaP is current as of August 2001. However, resource maps and accompanying descriptions are based on pre-Hanford fire 2000 information. Resources on the Site currently are being evaluated, and the changes will be reflected in revised maps that will be posted on the World Wide Web (www.pnl.gov/ecology/ecosystem). Check the website for the most current resource maps.

S.4 Hanford's Biological Resources: Management by Level of Concern

The Hanford Site is located within the Columbia Basin Ecoregion. In the last hundred years, the steppe and shrub-steppe communities of this ecoregion have undergone substantial loss or degradation attributed primarily to human development (Dobler 1992; Noss et al. 1995). However,

because of Hanford's initial use as a production site for defense nuclear materials, much of the Site has been protected from intensive industrial and agricultural development. As a result, the Site retains the largest remaining blocks of relatively undisturbed shrub-steppe in the Columbia Basin Ecoregion (Smith 1994) and a corresponding diversity of plant and animal communities (TNC 1995, 1996). In addition to shrub-steppe, the Site contains significant riparian, wetland, and aquatic habitats associated with the Hanford Reach.

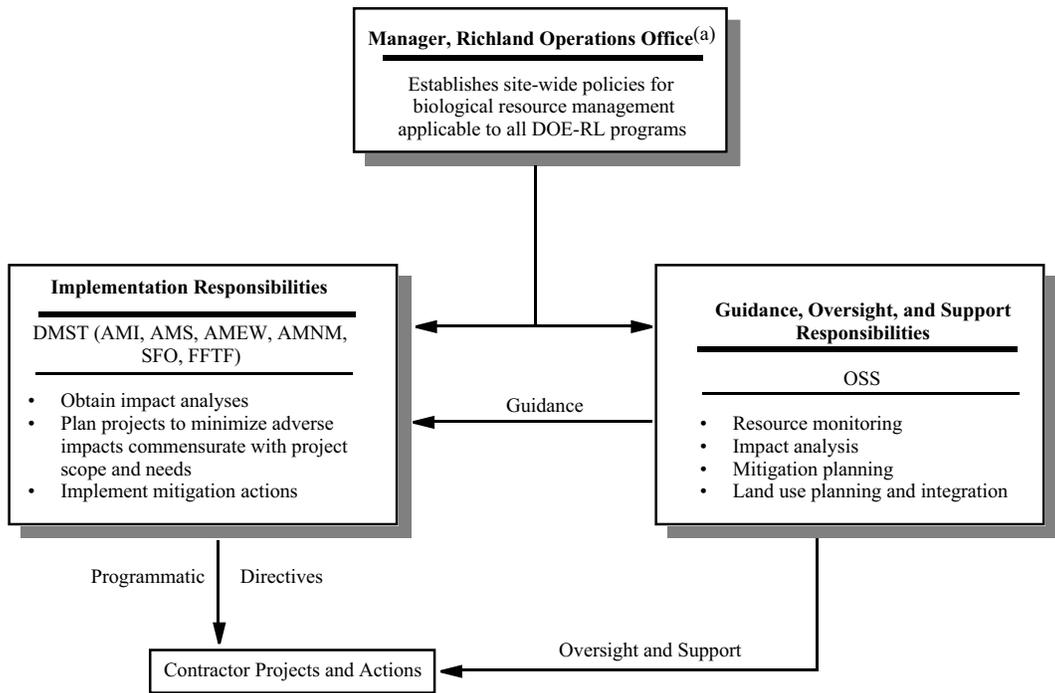
Recently, The Nature Conservancy (TNC) of Washington, in cooperation with DOE-RL, implemented a detailed inventory of Hanford's rare species and ecosystems on the Site to assist DOE-RL in making more informed decisions about future land uses. The TNC (1996) concluded that:

From a conservation standpoint, the Hanford Site is a vital—and perhaps the single most important—link in preserving and sustaining the biodiversity of the Columbia Basin's shrub-steppe region.

To manage the biological resources described above, DOE-RL has developed an approach that associates different management actions—monitoring, impact assessment, mitigation, and restoration—with particular sets of biological resources. This approach accounts for differences in resource "value" (i.e., that some resources require greater management attention than others.) For example, a native sagebrush/bunchgrass community that is rare in the ecoregion would warrant greater management attention than would a disturbed area dominated by non-native plants such as cheatgrass.

To address these differences in "value" DOE-RL classifies Hanford Site biological resources by four levels of management concern (I-IV). Level I represents the lowest level of management concern and Level IV the highest. Each level has a specific set of recommended management actions. As Table S.1 shows, biological resources categorized at Level I require monitoring, but no other management actions such as impact assessment or impact mitigation are required. At higher levels of concern (Levels III and IV), however, the number of management actions increases, and the actions become more restrictive.

Biological resources on the Site are defined by species category or by either landscape-level attributes such as plant communities or habitats—the latter as defined by their usage by plants, fish, or



AMI = Office of Assistant Manager for Planning & Integration	AMNM = Office of Assistant Manager for Nuclear Materials and Facility Stabilization
AMS = Office of Assistant Manager for Engineering and Standards	DMST = Deputy Manager for Site Transition
AMEW = Office of Assistant Manager for Environmental Restoration & Waste Management	FFTF = Fast Flux Test Facility Project office
	OSS = Office of Site Services
	SFO = Office of Spent Nuclear Fuels

(a) Office of River Protection has parallel responsibilities.

Figure S.2 Roles and Responsibilities

Table S.1 Classes of Management Actions and the Biological Resource Levels of Concern at Which They Apply

Class of Management Actions	Resource Level of Concern at Which the Management Action is Applicable			
	I	II	III	IV
Status monitoring	Yes	Yes	Yes	Yes
Impact assessment	No	Yes	Yes	Yes
Mitigation via avoidance/minimization	No	Yes	Yes	Yes
Mitigation via rectification/compensatory mitigation	No	No	Yes	Yes ^a
Minimum NEPA analysis required	CX	CX	EA	EA

^a Rectification is probably not possible and is not an appropriate means of mitigation at this level; compensatory mitigation can be used but only when it is achieved by acquisition and/or protection of in-kind resources (cf. USFWS Mitigation Policy at 46 FR 7644). CX = categorical exclusion; EA = environmental assessment.

wildlife—or by administrative designation. Level I resources include species such as the Great Basin pocket mouse and Rocky Mountain elk. Level II resources include 115 species of plants, fish, and wildlife—86 of which are birds—and wildlife habitat areas in an early stage of vegetation change as a result of recent fires. Examples of Level III resources on Hanford include the sage sparrow and Columbia yellowcress, the largest population of which in Washington State occurs along the Hanford Reach. Level III habitat areas include wetlands, the Hanford Reach 100-year floodplain, and mature stands of shrub-steppe. As a federally designated Research Natural Area, the Fitzner/Eberhardt Arid Lands Ecology (ALE) Unit also is considered a Level III resource. Level IV, the highest and most restrictive level of management concern, applies only to rare pristine plant communities and habitats and to five species (two species of fish and three bird species), only two of which, the bald eagle and fall chinook salmon, are common.

Figure S.3 shows the extent and distribution of Level II, Level III, and Level IV resources across the Hanford Site (species-based information is included only for Level IV resources). This composite map was developed from individual map layers developed using concise Geographic Information System (GIS)-based summaries of the biological data at a landscape scale. These data layers can be used to make land-use and environmental cleanup decisions that are intended to avoid significant impacts to biological resources.¹

S.5 Management of Biological Resource Impacts: Impact Assessment, Mitigation, and Restoration

Shaded boxes in the following sections highlight specific commitments for managing biological resources at Hanford; the DOE-RL, contractor project, or lease or permit holder responsible for implementing the management action; and the timetable for completion of the action.

Although DOE-RL recognizes that impacts to biological resources cannot always be eliminated, potential impacts must be assessed during early

phases of project development and their consequences incorporated in decision making. This is initiated through an ecological compliance review. Through the review process, impact assessments are conducted for projects that potentially could impact the biological environment. The process

Impact Assessment

Commitment: To determine whether a proposed action requires an ecological compliance review, submit a request for review to the Hanford Biological Resources Laboratory (at PNNL) (if non-CERCLA related) or to the Environmental Restoration Contractor (if CERCLA related). Follow up on report review recommendations. Include report findings in project documentation.

Implementation Responsibility: All programs/projects responsible for impact assessment; Office of Site Services (Hanford Biological Resources Laboratory)

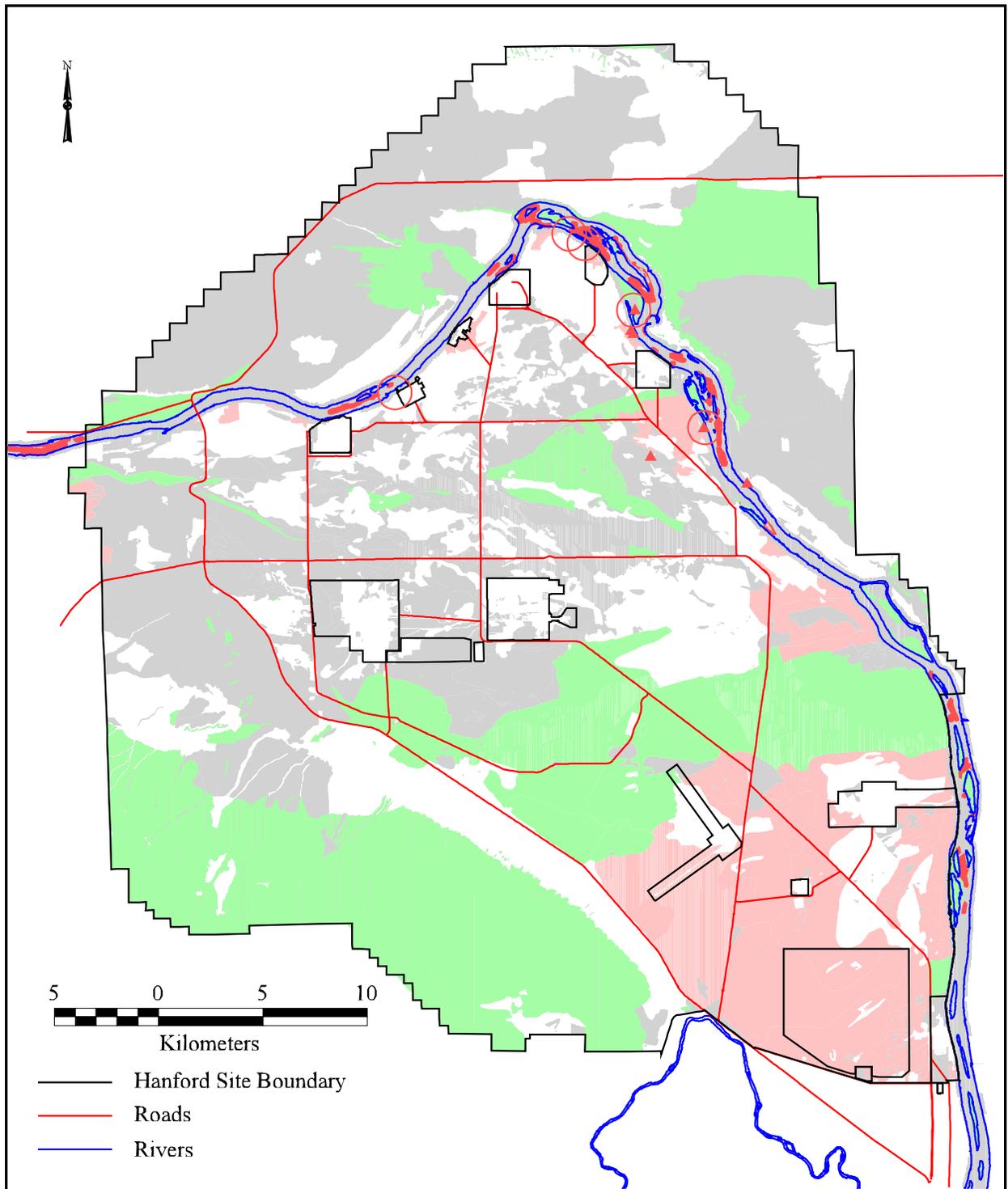
Timeframe: Early stages of project planning

complements other environmental reviews such as facility pre-operational baseline studies.

If an ecological compliance review determines adverse impacts to biological resources—such as habitat alterations or disturbances that could affect the reproductive success of species of concern—specific mitigation actions are identified. Mitigation is a series of prioritized actions that, taken together, reduce or eliminate significant adverse project impacts to biological resources. Table S.2 shows the hierarchy of mitigation actions.

Mitigation of significant adverse impacts to biological resources via rectification and/or compensatory mitigation is intended to ensure, to the extent practicable, no net loss of Level III or Level IV biological resources of concern on the Hanford Site. Avoidance and then minimization of adverse impacts are always the preferred mitigation actions. Some projects, however, may be of such a scale and/or have specific siting criteria that make complete avoidance and minimization impossible. In these cases, mitigation through on-site rectification and/or compensatory mitigation away from the project site would be recommended.

¹ Boundaries of the various habitat levels are approximate but change with time. Actual onsite evaluations should be used to make the final determination of habitat level.



- Level II Resources
- Level III Resources
- Level IV Habitat-Based Resources
- Level IV Species-Based Resources

Figure S.3 Composite Map of Level II, Level III, and Level IV Biological Resources (Level I resources are not depicted because they are ubiquitous and require no mitigation.)

Table S.2 Hierarchy of Mitigation Actions for Biological Resource Impacts

Mitigation	Utilization Preference	Description of Mitigation Means
Avoid impact	1st	Alter proposed project (timing, location, or implementation) to avoid injury to biological resources of concern
Minimize impact	2nd	Alter proposed project to minimize injury to biological resources of concern
Rectify the impact	3rd	Replace at the project site the biological resources to be disturbed
Compensate for the impact	4th	Replace or relocate away from the project site the biological resources to be disturbed

Mitigation

Commitment: Determine if mitigation is required for the proposed action in accordance with the guidance provided in BRMaP. If so, implement mitigation requirements using the mitigation hierarchy. Implement any needed mitigation via rectification and/or compensatory mitigation as described in *the Biological Resources Mitigation Strategy*

Implementation Responsibility: All programs/projects responsible for mitigation; Office of Site Services (Hanford Biological Resources Laboratory)

Timeframe: Use of the mitigation hierarchy is most useful if incorporated during the early stages of project planning. Implementation of any necessary mitigation via rectification and/or compensatory mitigation should commence as soon as the impact is identified or at least soon after the impact occurs.

While mitigation addresses impacts to existing biological resources that will occur as a result of a proposed action, restoration addresses human-caused impacts that may have occurred in the past. The purpose of restoration is to create some amount of habitat value at a site (e.g., past-practice waste site, industrial area, road) where at the time of remediation, decommissioning, or end of use little or no value exists. The specific restoration goal depends, in part, on the site’s future use. In cases where the land-use goal is not to create habitat value at a particular site, the site simply may be stabilized, or it may be converted to other uses.

S.6 Biological Resource Inventory and Monitoring

Inventory and monitoring of biological resources at Hanford are vital management actions for DOE-RL to show that its actions are not resulting in significant adverse cumulative impacts to Hanford’s biological resources. Biological resource inventory and monitoring also provide the technical basis for resource management via an ecosystem management approach.

Information on the identity, location, population size, or community distribution of a resource is obtained initially by a field inventory and frequently displayed as resource maps. Inventory work on Hanford’s biological resources has been an ongoing process. Some plant communities and habitats have been mapped in detail.

Restoration

Commitment: Restore or stabilize human-impacted areas as necessary or when made a requirement under a record of decision or mitigation action plan.

Implementation Responsibility: Relevant program/project

Timeframe: Determine need during the early stages of project planning for remediation, decommissioning, or end of use. Implement restoration or stabilization actions as soon after the completion of remediation or decommissioning as is reasonably possible.

Management Objectives

The following objectives are based on inventory and monitoring goals. They provide a strategy by which an effective inventory and monitoring program can be implemented.

1. As part of the Ecosystem Monitoring Project at Hanford, coordinate with other biological resource agencies, Tribes, and stakeholders to ensure a comprehensive and regionally consistent set of biodiversity indicator variables is identified. Monitoring these will enable evaluation of changes in the integrity of the Hanford ecosystem within its bioregional context.

Within 1 year of issuance of BRMaP as a final document, devise a Hanford monitoring strategy that contributes to a long-term, regionally based monitoring program for the Columbia Basin Ecoregion.

2. Within 1 year of issuance of BRMaP as a final document, develop, through joint participation of appropriate Hanford contractor and DOE-RL program and Office of Site Services staff, consistent monitoring procedures for tracking the success and effectiveness of mitigation/restoration actions and for determining when corrective actions are necessary. The monitoring guidance and requirements outlined in the BRMiS (DOE-RL 1996) provide an initial starting point.
3. Within 1 year of issuance of BRMaP as a final document, evaluate, through joint participation of contractor contaminant-monitoring projects at Hanford, the need for and extent of monitoring plant, fish, and wildlife exposure to and uptake of chemical and radiological contaminants. The evaluation should consider existing exposure pathways and their trends over time, the results of the Columbia River Comprehensive Impact Assessment, the current biotic monitoring activities that are conducted in support of human and environmental exposure assessment, and the potential for future Site activities creating new exposure pathways.

Monitoring is the repetitive survey process that tracks the status and condition of a resource. Monitoring often occurs at the population (individual or multiple species) or ecosystem (individual or multiple habitats/plant communities) level to facilitate tracking trends in resource size or distribution. Monitoring at Hanford, to date, has been directed at identifying trends in specific species populations to determine impacts from Hanford Site activities or monitoring the status of species of concern to meet legally mandated protection requirements for those species. Besides these traditional monitoring activities, BRMaP outlines strategies for monitoring

Hanford's overall ecosystem integrity and for monitoring designated mitigation/restoration areas.

S.7 Landscape Management

Although DOE-RL does not have the authority to directly manage species, it does manage actions and processes that affect multiple species, habitats, and ecosystems. Landscape management activities considered in BRMaP include fire management; habitat fragmentation; landscape-level human activities such as road construction and agriculture; revegetation practices; and administrative control of land areas.

Fire management policy for Hanford's habitats of concern is to minimize the potential for human-caused fires and to aggressively fight fires.

Fire Management

Commitments: Create a Hanford fire management policy that relates fire-fighting with biological resource values. The policy will include strategies for protecting biological resources of concern from fire and minimizing the impacts to these resources from fire-fighting techniques.

Implementation Responsibility: Assistant Manager for Engineering and Standards (Hanford Site Fire Department); Office of Site Services (Ecosystem Monitoring Project)

Timeframe: Within 1 year of BRMaP issuance as a final document

Revegetation on the Hanford Site is an important component of many Site activities, including waste site restoration or interim stabilization and mitigation actions.

The five major types of revegetation actions are: (1) short-term interim stabilization, (2) long-term interim stabilization, (3) habitat improvement via habitat amendment, (4) habitat improvement via reclamation or habitat creation, and (5) landscaping.

Specific goals for managing landscape-level attributes are to maintain all native terrestrial and aquatic resident species at viable population levels, maintain viable representatives of all native plant

Revegetation Practices

Commitment: Follow protocols for revegetation actions included in BRMaP.

Implementation Responsibility: All programs/projects; Office of Site Services; (Hanford Biological Resources Laboratory); permit holders as applicable

Timeframe: Ongoing

and animal communities and the functionality of both biotic and abiotic ecosystem processes, and have no adverse impacts on populations of migratory species. Management of landscape attributes will focus on three classes of management actions: evaluation and management of DOE-RL impacts, status monitoring, and preservation actions. These management actions are implemented in a graded approach that reflects the level of concern for each landscape-level attribute.

Some areas of Hanford have administrative designations with a biological resource protection element. For example, Hanford is one of seven DOE

Landscape-Level Attributes

Commitment: Avoid or otherwise minimize fragmentation of Level II, III, and IV habitats/plant communities of concern. Use the graded approach to manage landscape-level attributes.

Implementation Responsibility: Office of Site Services (Hanford Biological Resources Laboratory and Ecosystem Monitoring Project); Assistant Manager for Engineering and Standards

Timeframe: Ongoing

sites established as a National Environmental Research Park that provide a protected area for research demonstrations and education in ecology (DOE 1994). Also, the ALE Unit was designated a Research Natural Area as a result of an interagency federal cooperative agreement (PNL 1993) to serve scientific and educational purposes and act as a baseline for comparison with similar, but intensely managed, areas.

Administrative Designations

Commitments: On the ALE Unit, access is restricted to activities related to research, education, Native American cultural practices, or facility/infrastructure maintenance. Agriculture and domestic livestock grazing are prohibited, except for experimental purposes. Access for mineral and energy resource exploitation is prohibited except for two borrow sites along Route 240. Vehicular traffic off of established roads is expressly prohibited.

Compensatory mitigation areas and their associated habitat improvement areas will be managed as Level IV resources. Onsite rectification and restoration areas will be managed as Level III resources. Mitigation and restoration actions at Hanford specifically intended to replace habitat value will require plant material that is locally derived.

DOE-RL will manage its actions to avoid significant impacts to species of concern within designated administrative control areas

Implementation Responsibility: Office of Site Services (Ecosystem Monitoring Project and Hanford Biological Resources Laboratory); all programs/projects

Timeframe: Ongoing

Other administrative designations related to resource protection areas include (1) areas containing rare plant communities (element occurrences), (2) mitigation/restoration areas, (3) collection/propagation areas for native plant materials, (4) lands used under permit and leased properties, and (5) species of concern administrative control areas, which include bald eagle buffer zones, fall chinook salmon spawning locations, ferruginous hawk buffer zones, and plant species of concern (Level III and IV) population locations.

The portions of the Hanford Site DOE-RL makes available to the U.S. Fish and Wildlife Service under permit are the Wahluke Unit, the Saddle Mountain Unit, and the Fitzner/Eberhardt Arid Lands Ecology Reserve (ALE) Unit, which form the Hanford Reach National Monument/Saddle Mountain National Wildlife Refuge. These lands are managed principally to protect their biological resource values. The DOE-RL also leases portions of the Hanford Site for a variety of purposes not related to biological resources management.

Agriculture

Commitment: DOE-RL will monitor animal populations that are potential agents for damage to nearby agricultural interests and share that information with the USFWS.

Implementation Responsibility: Office of Site Services (Ecosystem Monitoring Project)

Timeframe: Ongoing

Domestic livestock grazing is prohibited on all Hanford lands. Although limited grazing occurred in the past, a recent Presidential Proclamation (7319, June 9, 2000) established the Hanford Reach National Monument and restricted grazing and off-road vehicle use.

The only current use of the Hanford Site for agriculture occurs on the Wahluke Unit. Agriculture use beyond 2002 will be determined by the U.S. Fish and Wildlife Service based on management planning for the national monument, which is in

Road/Railroad/Utility Corridor Construction

Commitment: When new roads/railroads/utility corridors are unavoidable, they should be built, as much as possible, through already disturbed areas. No roads/railroads/utility corridors shall be built through Level IV resource areas. No recreational use of motor-powered off-road vehicles is permitted on the Site. A Hanford Site policy that generally prohibits all off-road driving will be advertised in appropriate Hanford Site publications accessible to Site employees. This policy also will be made available to permit and lease holders.

Implementation Responsibility: Office of Site Services (Hanford Biological Resources Laboratory); Assistant Manager for Engineering and Standards

Timeframe: Ongoing

progress. The remainder of the Hanford Site is not currently farmed. Permit agreements may place restrictions on additional agricultural practices.

Because it leads to habitat fragmentation, new road/railroad/utility corridor construction should be avoided. When new roads/railroads/utility corridors are unavoidable, they should be built, as much as possible, through already disturbed areas. No vehicles are permitted off established roads on the Hanford Site unless specifically approved by DOE-RL's Office of Site Services for conducting work activities or if required by an emergency situation.

S.8 Species Management

Species management includes integrated pest management, control of species introductions, and some management actions associated with state or federally listed species or recreationally and/or commercially important species. Generally, DOE-RL assists fish and wildlife agencies in species management by providing monitoring data on selected species, conducting impact assessments for individual

Management of Some Recreationally and/or Commercially Important Species

Commitment: Continue to monitor the Hanford elk herd to determine effects on habitat and whether dispersal is occurring into other areas of the Site.

Implementation Responsibility: Office of Site Services (Ecosystem Monitoring Project)

Timeframe: Ongoing

species of concern, protecting and/or manipulating habitat, and otherwise cooperating with the agencies on fish and wildlife issues of mutual interest.

The DOE-RL has adopted the use of integrated pest management strategies and methods to control pests at Hanford facilities. Professional pest managers will use information in BRMaP to identify species and habitats of concern that could be impacted by pest control practices and modify their actions accordingly. The control of noxious weeds and other undesirable plants is an important component of integrated pest management and biological resource management in general. The use of

Integrated Pest Management

Commitment: Consult the *Hanford Site Integrated Pest Management Plan* for specific implementation procedures for pest control. Consider the control of noxious weeds and other non-desirable plants, especially when their presence may impact Level IV resource areas.

Implementation Responsibility: Office of Site Services (Hanford Biological Resources Laboratory)

Timeframe: Ongoing

appropriate control strategies when plant populations are small and localized is the most cost-effective means of minimizing the impacts of noxious weeds and other undesirable plants to biological resources of concern.

Much of the reduction in Hanford's biodiversity can be attributed to the introduction (mostly unintentional) of non-native species. The continued introduction of non-native species to Hanford could do irreparable harm to both the abundance and diversity of the native flora and fauna.

Species Introduction

Commitment: No non-native plant or animal species will be introduced to the Hanford Site without appropriate authorization.

Implementation Responsibility: Office of Site Services (Hanford Biological Resources Laboratory)

Timeframe: Ongoing

Specific exceptions to a general prohibition against non-native species introductions are allowed in regard to revegetation practices. Also, in limited circumstances it may be necessary to introduce non-native species for use as biological control agents as part of an integrated pest management strategy.

Species requiring special management include all species identified as Level II, III, and IV. Management of these species will focus on three classes of



management action: evaluation and management of DOE-RL impacts, species/habitat tracking, and focused enhancement. These management actions are implemented in a graded approach that reflects the level of concern for each species group. Although Level I species require monitoring, they do not qualify for any additional management attention.

Management of some recreationally and/or commercially important species at Hanford includes fish rearing; deer and elk management; and hunting, fishing, and trapping. Plant and animal species are protected on the ALE Unit, and no hunting or trapping is permitted.

Listed or Otherwise Protected Species Requiring Special Management

Commitment: Use the graded approach to manage Level II, III, and IV species.

Implementation Responsibility: Office of Site Services (Hanford Biological Resources Laboratory and Ecosystem Monitoring Project)

Timeframe: Ongoing

S.9 Biological Resource Data Management

To facilitate biological resource management, procedures are necessary to define how Site floral and faunal survey data are maintained. A primary data base will be maintained that contains up-to-date data on plant, fish, and wildlife species of concern associated with the Hanford Site.

This data base will be maintained by the Hanford Biological Resources Laboratory and will be DOE-RL's official reference source for documenting the occurrence of a particular species on the Hanford Site, its federal and state listing status, and its level of management concern as assigned in BRMaP.

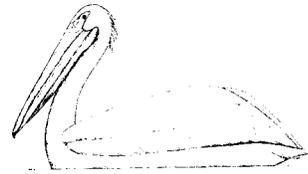
Geographic Information System-based resource maps will be maintained and updated as needed by the Laboratory (industrial areas) and the Ecosystem Monitoring Project (all other resource layers).

Biological Resource Data Management

Commitment: Establish data transfer procedures that will address the appropriate handling of sensitive biological resource data.

Implementation Responsibility: Office of Site Services (Ecosystem Monitoring Project); Assistant Manager for Environmental Restoration and Waste Management (Environmental Restoration Contractor Team data base management staff)

Timeframe: Within 1 year of BRMaP issuance as a final document



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1.0 Introduction



1.0

Introduction

The 1517 km² (586 mi²) Hanford Site is part of the Columbia Basin Ecoregion (Daubenmire 1970; Franklin and Dyrness 1973). The ecoregion includes approximately 6 million ha of steppe and shrub-steppe vegetation covering most of central and southeastern Washington State, as well as a portion of northcentral Oregon. A free-flowing stretch of the Columbia River, known as the Hanford Reach, runs through the northern part of the Site and forms part of its eastern boundary (Figure 1.1).

Plant communities found on the Hanford Site are remnants of the original shrub-steppe vegetation. Until 200 years ago, shrubs and native grasses dominated the vegetation of the entire shrub-steppe. As a result of European settlement and extensive land conversion, however, much of the native vegetation has either been altered or eliminated. Because Hanford lands have been protected from human intrusion, they provide much of the remaining sizable acreage of relatively undisturbed shrub-steppe in the state. This undeveloped land provides habitat for native wildlife populations, many of which are diminishing elsewhere in eastern Washington.

As a federal land manager, the U.S. Department of Energy (DOE) is responsible through its Richland Operations Office (DOE-RL) for conserving the biological resources (fish, wildlife, and plant populations and their habitats) of the Hanford Site. The DOE-RL currently manages impacts to threatened and endangered species through a number of separate initiatives, but no previous management strategy considered the overall health of the entire Hanford ecosystem (which includes all aquatic, riparian, and upland habitats and their associated species assemblages). To fill this management void, a comprehensive plan was needed that viewed Hanford's biological resources

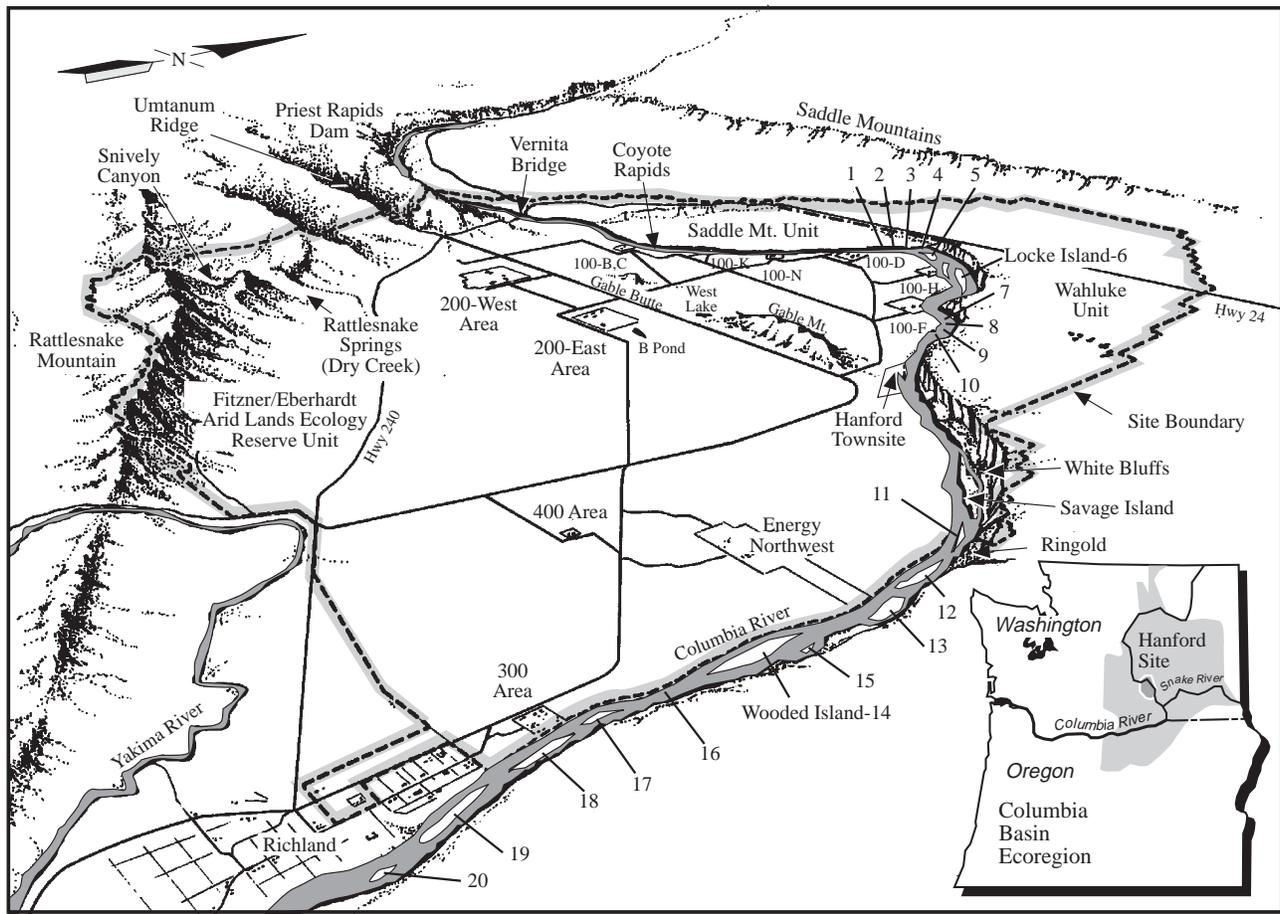
and their management from both a site- and program-wide perspective.

1.1 Purpose and Scope

The *Hanford Site Biological Resources Management Plan* (BRMaP) was developed to provide DOE-RL and its contractors with a consistent approach to protect biological resources and to monitor, assess, and mitigate impacts to biological resources from Site development and environmental cleanup and restoration activities, as well as approaches to better manage total resources. As a comprehensive plan, BRMaP provides a framework to enable Hanford Site resource professionals to effectively fulfill their responsibilities and to address Tribal, resource agency and other stakeholder concerns about Hanford's biological resources.

The primary purposes of BRMaP are to (1) support DOE-RL's environmental cleanup and other Hanford Site missions; (2) provide DOE-RL with a mechanism for ensuring compliance with those laws that relate to the management of potential impacts to biological resources; (3) provide a framework for ensuring appropriate biological resource management goals, objectives, and strategies are in place to facilitate DOE-RL stewardship of Hanford's biological resources; and (4) implement an ecosystem management approach for biological resources on the Hanford Site.

Because it is more efficient to manage habitats to maintain natural populations than to restore threatened and endangered species, BRMaP focuses on management prescriptions that help ensure threats to habitat—such as direct loss and fragmentation—are addressed in addition to single species concerns.



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Figure 1.1 Location and Major Features of the Hanford Site Within the Columbia Basin Ecoregion

Additionally, BRMaP places a strong emphasis on the benefits of good up-front planning for mitigation and restoration of impacts to Hanford's biological resources. The resource data and management framework that BRMaP provides also can be used to help support a smooth transition to future site uses. As a living document, BRMaP can accommodate changes in the status of the resource base and in DOE-RL missions.

Development of a Hanford Site biological resource management plan is consistent with Secretary of Energy policy (see Chapter 2.0) and with resource management plans developed at other DOE sites. For example, a multi-volume plan was developed to manage habitat and wildlife, among other resources, at the Oak Ridge Reservation. Descriptions of this and other DOE site resource management plans are included in Appendix A.

The BRMaP will be reviewed for its ability to meet DOE-RL's biological resource management needs

Scope of BRMaP

The BRMaP:

- describes how biological resources will be managed on the Hanford Site within the greater context of the Columbia Basin Ecoregion.
- identifies resources that require status monitoring, impact assessment, and appropriate mitigation.
- prescribes management levels (e.g., mitigation thresholds) for these resources.

at least every 2 years and will be updated as needed (e.g., when the status of a particular resource changes, or management prescriptions are modified in response to new findings). This version of BRMaP is current as of August 2001. However, resource maps and accompanying descriptions are based on pre-Hanford fire 2000 information.

Resources on the Site currently are being evaluated, and the changes will be reflected in revised maps that will be posted on the World Wide Web (www.pnl.gov/ecology/ecosystem). Check the website for the most current resource maps.

1.2 Applicability

The BRMaP is guidance that applies to DOE-RL unless there is a management decision not to apply it. This plan will not have a retrospective effect. In determining how to apply this plan, DOE-RL will consider whether resources have been irreversible and irretrievable (I&I) committed. The BRMaP applies to all DOE-RL programs at all locations within DOE-RL's administrative control. It may apply to DOE-RL contractors and permit and lease holders through those contractual documents. Existing contracts, permits, and leases may be modified, as necessary, to meet the management objectives of this plan. The BRMaP does not create any right, benefit, or trust responsibility, substantive or procedural, enforceable against the United States, its agencies, officers, or any person.

1.3 Relationship to Other Planning Documents

Figure 1.2 shows the relationship of BRMaP to two primary Hanford Site planning documents, the Hanford Mission Plan (issued periodically) and the *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS)* (DOE 1999), and to other biological resource management documents such as the *Ecological Compliance Assessment Management Plan* (DOE-RL 1995), *Biological Resources Mitigation Strategy* (DOE-RL 1996), and *Integrated Biological Control Management Plan* (Fluor Hanford 2000). As part of total resource management at Hanford, BRMaP also must integrate its management actions with other primary resource management documents, including the *Hanford Cultural Resources Management Plan* (DOE-RL 2001) and Hanford Groundwater Protection Management Plan.

The BRMaP is intended to provide general, but comprehensive, direction that specifies DOE-RL policies, goals, and objectives relative to different biological resource management concerns and prescribes how such policies, goals, and objectives

will be met. Subtier documents, such as the *Ecological Compliance Assessment Management* (DOE-RL 1995) and *Biological Resources Mitigation Strategy* (DOE-RL 1996), outline specific management actions necessary to meet various policies, goals, and objectives (The working relationship of these two subtier documents to BRMaP and to each other is further elucidated in Chapter 5.0.).

The DOE-RL will define its biological resource management policies through BRMaP (see Section 2.2.1). Although the policies provide some general direction as to appropriate uses of Hanford lands and their resources, DOE-RL will use the *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement (HCP EIS)* (DOE 1999) ecosystem-based strategy to manage and control development of Hanford lands and facilities. The Land Use Plan strategy integrates appropriate biological resource data and biological resource management policies, goals, and objectives from BRMaP with other components dealing with environmental, cultural, economic, and sociopolitical elements.

Although BRMaP addresses specifically only the biological resource management aspects of the Hanford Site's natural and cultural resources for local Tribes, biological resources also may be considered cultural resources. Thus, BRMaP and the *Hanford Cultural Resources Management Plan* (DOE-RL 2001) need to be fully integrated.

1.4 Plan Organization and Use

The BRMaP is designed to assist those Hanford Site program and project managers and resource professionals, local Tribes, resource agencies, and other stakeholders who have an interest or a role in the management of Hanford's biological resources. Table 1.1 provides a matrix that can be used to quickly surmise which sections of BRMaP may be of interest to the reader.

Chapter 2.0 provides a brief description of the primary legal drivers for biological resource management, outlines the Site's ecosystem management approach, and identifies DOE-RL's biological resource management policies. Chapter 3.0 describes the roles and responsibilities of DOE-RL and its contractors associated with biological resource management. Chapter 4.0 briefly describes the Columbia Basin Ecoregion, the Hanford Site and its land uses, and the regional and national

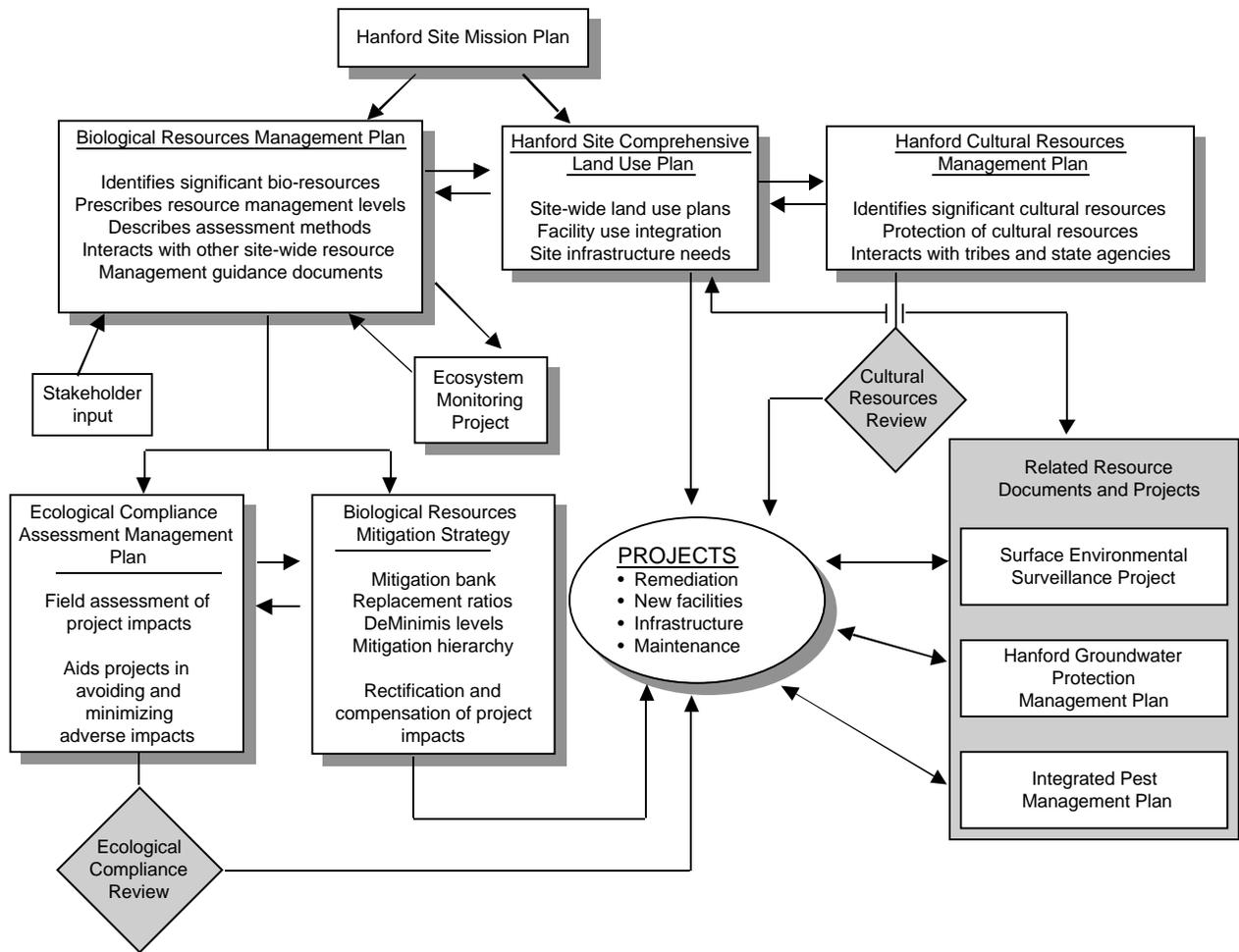


Figure 1.2 Relationship of BRMaP to Other Hanford Site Planning and Resource Management Documents

significance of Hanford’s biological resources. How Hanford’s biological resources will be managed by associating particular resources with specific levels of management concern also is described.

Chapters 5.0 and 6.0 address particular classes of management actions. Chapter 5.0 outlines impact assessment, mitigation, and restoration. Included in this chapter is a description of the ecological compliance review process. It also describes the mitigation hierarchy and how its efficient and consistent implementation can both protect biological resource values and minimize long-term mitigation costs. The chapter concludes with a section on restoration.

Monitoring and inventory are discussed in Chapter 6.0. Inventory of biological resources is an ongoing process. Some areas of the Site and certain taxa have been studied intensively, but for other biological resources significant data gaps remain.

Monitoring is a repetitive survey process that tracks the status and condition of the resource.

Chapters 7.0 and 8.0 outline management prescriptions for two different levels of the biodiversity hierarchy, landscape management and species management. Landscape management addresses actions and processes that affect multiple species, habitats, and ecosystems. Chapter 7.0 addresses such topics as fire management, revegetation practices, and administrative control areas. Chapter 8.0 focuses on management actions that generally involve single species or class of species concerns, including integrated pest management, listed or otherwise protected species management, and recreationally and/or commercially important species management.

Chapter 9.0 describes biological resource data management, including the types of biological resource data that need to be maintained and procedures for transfer of data to onsite and offsite

Table 1.1 Matrix of BRMaP Sections and User Categories^a

BRMaP Section	DOE-RL			
	DOE-RL/Contractor Program and Project Managers	Natural Resource Team and Contractor Resource Professionals	Tribes and Resource Agencies	Other Stakeholders
Executive Summary	X	X	X	X
1.0	X	X	X	X
2.0	X	X	X	X
3.0	X	X		
4.0	4.3	X	X	X
5.0	X	X	X	
6.0	6.4.4	X	X	X
7.0	7.2, 7.4, & 7.7	X	X	X
8.0	8.1	X	X	X
9.0		X		
10.0		X	X	X
11.0	X	X	X	X
Appendix A	A.1 & A.4	X	X	
Appendix B	X	X	X	
Appendix C		X	X	
Appendix D		X	X	X
Appendix E		X	X	
^a X = entire section may be useful to the reader; specific section referenced = only the specifically identified section is anticipated to be useful to the reader.				

users. References are included in Chapter 10.0 and a glossary of technical terms in Chapter 11.0.

Most detailed technical information is included in Appendices A-E. Appendix A provides an in-depth review of ecosystem management policy, principles, and implementation as they apply to the Hanford Site and DOE-RL. It also reviews natural resource management activities at other DOE sites. A review of the laws, regulations, Executive Orders, and policies that potentially affect the management

of Hanford's biological resources is included in Appendix B. Readers who want to know about the regional context of Hanford's biological resources and their significance can find this information in Appendix C. Most GIS-based resource maps provided in BRMaP and their technical basis are included in Appendix D. Appendix D also includes data tables and background information on species of concern. Appendix E identifies information needs required for more effective implementation of ecosystem management at Hanford.