

Mitigation Plan for the Integrated Disposal Facility (IDF)

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management



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Mitigation Plan for the
U.S. Department of Energy, Hanford Site,
Integrated Disposal Facility (IDF)

Prepared by Mission Support Alliance for the
CH2M Hill Plateau Remediation Contractor and
U.S. Department of Energy,
Richland Operations Office

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Terms

BRMP	Biological Resources Management Plan
CRR	cultural resources review
DOE	U.S. Department of Energy
EIS	environmental impact statement
ESA	<i>Endangered Species Act of 1973</i>
HCP	Hanford Comprehensive Land Use Plan
HCRMP	Hanford Cultural Resources Management Plan
IDF	Integrated Disposal Facility
MBTA	<i>Migratory Bird Treaty Act of 1918</i>
MP	Mitigation Plan
MSA	Mission Support Alliance
NEPA	<i>National Environmental Policy Act of 1969</i>
ROD	record of decision
SHPO	Washington State Historic Preservation Office

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1 Introduction and Background

This Mitigation Plan (MP) establishes the goals, objectives, and procedures by which the U.S. Department of Energy (DOE) will mitigate the impacts resulting from the expansion of the Integrated Disposal Facility (IDF) that will be used to enable the disposal of vitrified low-activity waste from the River Protection Project Waste Treatment Plant, River Protection Project tank operations Demonstration Bulk Vitrification System, and mixed waste from IDF operation.

Previous mitigation activities for the IDF construction are recorded in DOE/ORP-2005-5, *Mitigation Action Plan for the U.S. Department of Energy, Hanford Site, Integrated Disposal Facility (IDF) Construction*. The subject of this MP is the expansion of the IDF facility to the west and north of the existing boundary. The expansion involves clearing vegetation for the construction of staging areas, a parking lot, access roads, a sewer pipeline, water line, underground electrical line, and multiple pads to support IDF activities.

The expansion of the IDF facility will result in the loss of mature shrub-steppe habitat. The removal of mature vegetation will affect biota that depends on this habitat for food, shelter, and nesting. The shrub-steppe habitat in the 200 East Area acts as a refuge for animals such as black-tailed jackrabbits and sagebrush sparrows. The expansion of IDF will drastically fragment the shrub-steppe habitat in the 200 East Area. Additionally, it will further fragment the shrub-steppe habitat of the Hanford Site, reducing overall habitat quality. Particulate emissions will likely occur unless mitigated for during construction activities. Expansion of IDF also has the potential to affect cultural resources during subsurface excavations.

64 FR 61615, “Record of Decision: Hanford Comprehensive Land Use Plan Environmental Impact Statement (HCP EIS)” (hereinafter called the HCP EIS Record of Decision [ROD]), stipulates that “[a]ll proposals of land use potentially affecting resources will be required to comply with the applicable resource-specific requirements.” DOE/RL-96-32, *Hanford Site Biological Resources Management Plan* (hereinafter called the BRMP), and DOE/RL-98-10, *Hanford Cultural Resources Management Plan* (hereinafter called the HCRMP), provide the resource-specific guidance, including mitigation for biological and cultural resources. This MP describes how DOE will address the guidance provided in these documents, and thus how DOE will meet its commitment for resource mitigation under the HCP EIS ROD (64 FR 61615) regarding expansion of the IDF.

This MP has been prepared in compliance with the Council on Environmental Quality Implementing Regulations (40 CFR 1500-1508, “Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act”) for the *National Environmental Policy Act of 1969* (NEPA), and DOE NEPA regulations (10 CFR 1021, “National Environmental Policy Act Implementing Procedures”). This plan also incorporates guidance from the BRMP (DOE/RL-96-32) and the HCRMP (DOE/RL-98-10).

Expansions to the IDF footprint were proposed in 2018 and again in 2019; this MP accounts for both expansion areas as shown in Figure 1. The majority of the IDF expansion area is located west of the IDF original footprint. One expansion area is located on the northernmost boundary of the IDF footprint, and the remaining three area boundary expansions are on the eastern side of the footprint. The IDF expansion area totals 11.02 ha (27.24 ac). Project activities within the expansion area will include clearing, grubbing, and paving roads and parking lots; clearing vegetation and graveling for various cooling, treatment, and equipment staging pads; and clearing vegetation for water, sewer, and electrical lines. Most project activities within the IDF expansion area footprint require clearing shrub-steppe vegetation. In addition to these anticipated project activities, other development may occur in the IDF expansion area. Consequently, this MP considers the full 11.02 ha (27.24 ac) of shrub-steppe habitat that is included in the expansion area when requiring compensatory mitigation.

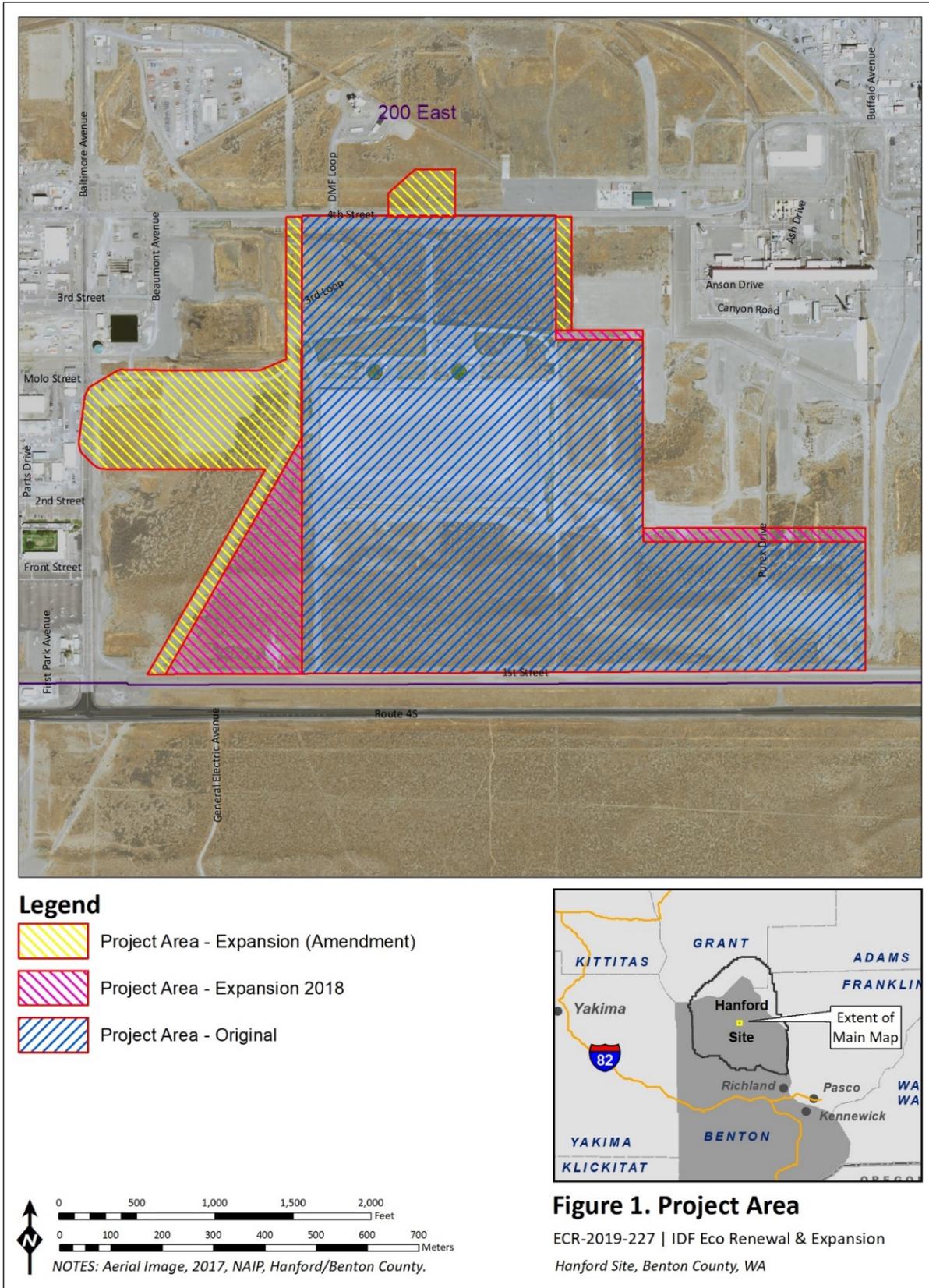


Figure 1. Current and Historic Mitigation Areas at IDF

2 Ecological and Cultural Resources

This chapter describes the known ecological and cultural resources present within the project area. This includes the results of previous ecological and cultural surveys within the project area, and the potential for cultural resources to be identified during project activities. The habitats within the project area, the species of flora and fauna present, and their federal and state classifications, if applicable, are also summarized. The ecological resource levels and their management goals according to the BRMP (DOE/RL-96-32) are explained in detail.

2.1 Ecological Resources

The IDF expansion area is located in the 200 East Area, in an ecosystem that historically was shrub-steppe habitat. Upon the development of the Central Plateau to support Manhattan Project activities, this habitat was fragmented by buildings, parking lots, and roads. Small patches of shrub-steppe habitat within the Central Plateau act as refuges from human activity for native flora and fauna. Project activities supporting the original footprint of IDF resulted in the further fragmentation of shrub-steppe habitat. The expansion of this IDF footprint into mature shrub-steppe habitat will further reduce usable habitat for the Hanford Site flora and fauna. Documents describing habitats applicable to this MP include the following:

- WHC-SD-EN-TI-216, *Vegetation Communities Associated with the 100-Area and 200-Area Facilities on the Hanford Site*
- HNF-61417, *Upland Vegetation of the Central Hanford Site*
- PNNL-6415, *Hanford Site National Environmental Policy Act (NEPA) Characterization*
- MSA-1903210, “Ecological Clearance Renewal and Amendment for the Construction and Maintenance of Integrated Disposal Facility (IDF) in the 200 East Area, Hanford Site (ECR-2019-227)”

The environment of the IDF expansion area was evaluated in August 2018 and again in August 2019 in field walkdowns by Mission Support Alliance (MSA) staff biologists. The habitat of the IDF expansion area is characterized by dense, mature stands of big sagebrush (*Artemisia tridentata*) that span the entire site. Sagebrush density ranges from approximately 15 to 30% coverage, and sagebrush is the dominant overstory plant. The northern half of the IDF expansion area has notably higher sagebrush coverage, and for this reason could be considered more ecologically valuable than the southern half. Bitterbrush (*Purshia tridentata*) and green rabbitbrush (*Chrysothamnus viscidiflorus*) are scattered throughout the site. The understory is dominated by nonnative cheatgrass (*Bromus tectorum*), similar to most areas of the Hanford Site (HNF-61417). Sandberg’s bluegrass (*Poa secunda*) is also present in the understory. Bastard toadflax (*Comandra umbellata*) is the most abundant forb in the understory. Western yarrow (*Achillea millefolium*), hoary aster (*Machaeranthera canescens*), desert parsley (*Cymopterus terebinthinus*), Carey’s balsamroot (*Balsamorhiza careyana*), and western tansy mustard (*Descurainia pinnata*) were all scattered throughout the understory. Nonnative plants scattered throughout the understory included cheatgrass, Russian thistle (*Salsola kali*), Jim Hill’s tumbledustard (*Sisymbrium altissimum*), and diffuse knapweed (*Centaurea diffusa*).

Signs of wildlife use were prevalent throughout the IDF expansion area. Coyote (*Canis latrans*) scat was found throughout the area. Sagebrush sparrows (*Artemisiospiza nevadensis*) were observed in the expansion area, and common ravens (*Corvus corax*) were heard vocalizing. Multiple side-blotched lizards (*Uta stansburiana*) were observed in the expansion area. In addition to these observed animals, wildlife that could be affected by disturbance of the IDF expansion includes the black-tailed jackrabbit (*Lepus*

californicus), mule deer (*Odocoileus hemionus*), northern pocket gopher (*Thomomys talpoides*), and western meadowlark (*Sturnella neglecta*), along with other migratory birds. Burrowing owl (*Athene cunicularia*) burrows have been observed directly south of the IDF expansion area as recently as June 2019.

All of the bird species observed are federally protected under the *Migratory Bird Treaty Act of 1918* (MBTA). Three of these wildlife species (sagebrush sparrows, burrowing owls, and black-tailed jackrabbits) are listed as Washington State Candidate species, meaning that the Washington Department of Fish and Wildlife will review them for possible listing as endangered, threatened, or sensitive (WDFW, 2004, “Priority Habitats and Species [PHS]”). These species rely on sagebrush habitat, and the growth of the IDF facility into the expansion area will likely have an impact on populations of these species within the Columbia Basin.

The Hanford Site is one of the last remaining continuous stretches of shrub-steppe in the Columbia Basin, and acts as a refuge to plants and animals native to Washington. Shrub-steppe habitat losses due to fire and human expansion increase the fragmentation of habitat and reduce overall habitat quality. In order to mitigate for losses of shrub-steppe environment, the BRMP (DOE/RL-96-32) provides guidance on how to classify natural habitat into resource levels that differ based on habitat quality. The previous IDF mitigation followed the interim mitigation guidance within DOE/RL-96-88, *Hanford Site Biological Resources Mitigation Strategy*, which resulted in a replacement ratio of 2:1 for the IDF project (DOE/ORP-2005-5). Replacement ratios have since been updated to more accurately reflect the wide variety of resources present on the Hanford Site.

After surveying the entire proposed project area, the environment was classified into resource levels using guidelines described in the most recent revision of the BRMP (DOE/RL-96-32). This review classified approximately 9.47 ha (23.41 ac) of the project area as BRMP Level 4 habitat, 0.27 ha (0.67 ac) as BRMP Level 3 habitat, and 1.28 ha (3.16 ac) as BRMP Level 2 habitat. The remaining habitat within the IDF expansion area is classified as BRMP Level 1 or BRMP Level 0, which does not require compensatory mitigation when removed. Section 2.3 provides more detail regarding the BRMP level system. The mitigatable habitat within the IDF expansion area totals 11.02 ha (27.24 ac) (Figure 2).

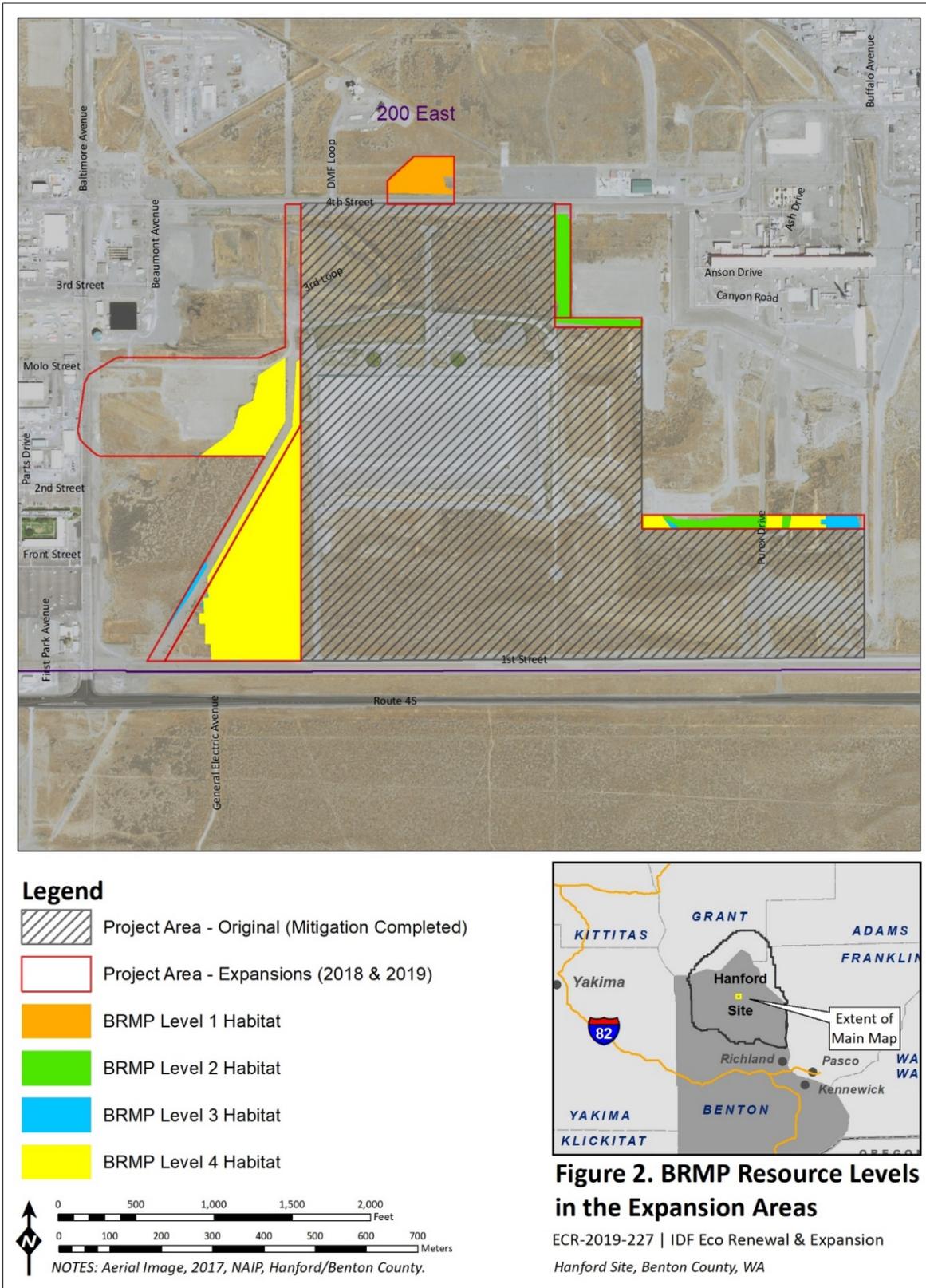


Figure 2. Biological Resources Management Plan Resource Levels at the IDF Expansion Areas as of 2019

2.2 BRMP Resource Levels

Including those considered rare or sensitive, habitat types are described in the BRMP (DOE/RL-96-32). To address resource value for management and mitigation concern, Levels 0 through 5 have been established and documented. Biological resources may have characteristics representative of more than one resource level. In these situations, resources are managed at the highest applicable level to ensure that the most valuable resources are conserved.

It is important to note that as the project advances, new updates of the BRMP (DOE/RL-96-32) may change the mitigation ratios required or the BRMP level of the project area. The most recent revision of the BRMP must be referenced and used in all mitigation planning. The six biological resource levels are described in the following sections.

2.2.1 Level 5 – Irreplaceable Resources

Level 5 biological resources are the most sensitive and rare resources on the Hanford Site. These resources are at risk of permanent extirpation or extinction or are considered irreplaceable if destroyed. Level 5 biological resources include those listed or formally proposed to be listed as threatened or endangered under the *Endangered Species Act of 1973* (ESA) as well as their critical habitat. Additional protected habitats include plant community element occurrences classified by Washington State as priority ecosystems that are necessary components of natural areas. Cliffs, lithosols, dune fields, ephemeral streams, vernal pools, and fall Chinook salmon and steelhead spawning areas are also protected as Level 5 habitat. These areas are federally protected, as they have a high level of regional or national significance and require a high level of monitoring.

Any loss of a Level 5 resource would represent a significant impact to the biodiversity and ecological integrity of the Columbia Basin ecoregion, and there is no practical way to restore a Level 5 resource once it is lost; therefore, avoidance and preservation are the management goals of Level 5 resource areas. If Level 5 resources may be affected due to Hanford Site activities, interagency consultation is required, and compensation will be determined on a case-by-case basis.

2.2.2 Level 4 – Essential Resources

Level 4 biological resources are considered essential to maintaining the biological diversity and function of the Hanford Site and the Columbia Basin ecoregion. Species listed by Washington State as endangered or threatened and species listed as federal candidates for ESA protection are considered Level 4 resources. These resources also include the vegetation and habitat that are essential to sustain state endangered or threatened species and federal candidate species, such as the burrowing owl and ferruginous hawk (*Buteo regalis*) nest sites. The bald eagle (*Haliaeetus leucocephalus*), which is protected under the *Bald and Golden Eagle Protection Act of 1940*, and its habitat on the Hanford Site are both Level 4 resources. High-quality stands of shrub-steppe with a native climax shrub overstory and a native grass understory (that are not listed as Level 5 element occurrences) are protected as Level 4 resources, as they are providing high-quality habitat corridors for wildlife and habitat for Washington State candidate species like the sage sparrow. Also included are riparian habitats, wetlands, and swales.

Similar to Level 5 resources, the management goal for Level 4 resources is avoidance and preservation, and a loss of Level 4 habitat represents a significant decrease in the biological diversity of the Hanford Site. Level 4 resources are extremely difficult to replace, but if avoidance is impossible compensatory mitigation will be performed to begin the process of replacing the lost habitat. Compensatory mitigation will be performed at a habitat replacement ratio of 5:1.

2.2.3 Level 3 – Important Resources

Level 3 biological resources are species and habitats that have been recognized by Washington State as having conservation concern. State sensitive and review plant species, state sensitive and candidate animal species, Washington Department of Fish and Wildlife priority species, culturally important species, and species listed by U.S. Fish and Wildlife Service as federal species of concern in the Columbia Basin ecoregion all fall under this category. Shrub-steppe communities that contain fragmented canopies of climax shrubs with native grass and cheatgrass codominant understories as well as successional shrub-steppe and steppe communities composed of primarily native species, are Level 3 resources. Along with these habitats, snake hibernacula, bat colonial roost sites, and wading bird rookeries are also protected as Level 3 habitat.

The management goal for Level 3 resources is to conserve these areas and to enhance key components of these habitats like quality or connectivity through management and stewardship. Avoidance and minimization are preferred in these areas, and when avoidance is impossible compensatory mitigation will be performed at a habitat replacement ration of 3:1 or as per other legal requirements, as in wetland mitigation.

2.2.4 Level 2 – Mid-Successional Communities

Level 2 biological resources include recreationally important species and species of potential conservation concern, such as migratory birds, state watch list plants, and state monitor wildlife species.

Mid-successional habitats with nonnative plants dominating the understory fall into Level 2 resources, and these habitats have high potential as restoration areas.

The management goal for Level 2 resources is to conserve and sustain the native species and habitats present by minimizing or avoiding impacts when possible. Level 2 habitats may be used to minimize impacts to higher resource levels, and when this is the case the habitat will be mitigated at a ratio of 1:1.

2.2.5 Level 1 – Common Species and Marginal Habitat Resources

Level 1 biological resources include relatively common native species as well as habitats that are too degraded or too fragmented and isolated to be of conservation value. Habitats dominated by invasive species like cheatgrass and Russian thistle fall into this category.

The management goal for Level 1 resources is mission support. Habitat replacement is not required, and these areas are not high priority areas for restoration as the likelihood of success is lowered in severely degraded habitats.

2.2.6 Level 0 – Nonnative Species, Industrial Sites, and Developed Areas

Level 0 biological resources have little to no ecological value and require no protection or conservation. Examples include industrial areas, landscaped areas, parking lots, and nonnative species.

The management goal for Level 0 resources is mission support, and there are no mitigation requirements associated with these resources beyond regulatory compliance. The MBTA still applies to Level 0 resources, as migratory birds will nest in developed areas. However, when it is not the nesting or fledging season, the developed habitat in Level 0 areas is not protected.

2.2.7 Additional Designations

Six administrative designations under the BRMP (DOE/RL-96-32) that require mitigation for any impacts associated with remedial action include the following:

- Areas containing rare plant communities (element occurrences)
- The Columbia River Corridor
- Mitigation/restoration areas
- Collection/propagation areas for native plant materials
- Lands used under permit/leased lands
- Administrative control areas for species of concern (i.e., bald eagle buffer zone, fall Chinook salmon spawning locations, plant species of concern populations [Levels 4 and 5]).

Although the construction and operation of the IDF expansion area is not anticipated to impact the habitats described above, if any impact does occur, mitigation will be required.

2.3 Potential Impacts to Cultural Resources

The Hanford Site has a long and varied history of human use. Cultural resources may be identified as prehistoric sites, traditional cultural properties, historic sites, or natural resources associated with the cultural landscape. Traditional cultural properties represent locations significant to a community's beliefs, customs, and practices. There are several traditional cultural properties on the Hanford Site, including Gable and Rattlesnake Mountains. Landscapes and their associated natural resources are also culturally significant. In this context, the term landscape refers to a cultural landscape that reflects the physical, biological, and cultural character of the people whose activities or occupancy shaped it. Historic sites may include towns, buildings, farmsteads and associated features, ferry locations, railroad lines, irrigation canals, roads, disposal locations, and equipment.

Federal law requires protection of cultural resources. The *Preservation of Historical and Archeological Data* (formerly *Archeological and Historic Preservation Act*) provides for the preservation of historical and archeological data (including artifacts) that might be irreparably lost or destroyed as a result of a proposed action. The *National Preservation Programs, Division A—Historic Preservation* requires that the effects of an action on cultural resources listed in or eligible for listing in the National Register of Historic Places be considered and accounted for prior to proceeding with the action; these resources are referred to as historic properties. The *Native American Graves Protection and Repatriation Act of 1990* requires agencies to consult with and notify culturally affiliated tribes when Native American human remains are inadvertently discovered during project activities. If human remains are encountered, procedures documented in the HCRMP (DOE/RL-98-10) will be followed.

2.4 Potential Impacts to Ecological Resources

The conversion of shrub-steppe communities to cropland and rangeland has led to the loss of over half of Washington's historic shrub-steppe habitat and has led to habitat fragmentation and degradation. These habitat losses have caused severe declines in many biological resources, including the greater sage-grouse (*Centrocercus urophasianus*), ground squirrels (*Urocitellus* sp.), and burrowing owls. Any removal of native habitat on the Hanford Site shrinks and damages one of the only remaining large, continuous patches of undisturbed shrub-steppe habitat in the state of Washington. The removal of mature

sagebrush habitat will likely degrade the health of the surrounding environment by making the invasion of nonnative species like cheatgrass and Russian thistle more likely.

The removal of 11.02 ha (27.24 ac) of Level 2, 3, and 4 habitat in order to expand IDF will adversely impact the continuity of the shrub-steppe environment. Removing habitat can isolate populations of species, making them less resilient to environmental changes. It places more stress on species that rely on forbs for food, like pollinators, causing them to travel longer distances to find food and other resources. Potential nesting areas will be removed, placing increased stress on birds like the sage sparrow, a state candidate species that depends on mature sagebrush for nesting.

Burrowing owls have been observed <300 m (984 ft) away from the IDF expansion area as recently as June 2019, suggesting the project area may span over suitable burrowing owl habitat. The removal of this habitat may negatively impact the already declining burrowing owl population, which is both a federal species of concern and a state candidate species.

Impacts to wildlife from construction may include the disruption of nesting migratory birds or protected species such as the loggerhead shrike (*Lanius ludovicianus*) or sage sparrow. Disturbances caused by construction during sensitive periods like nesting and migration will negatively affect birds and have the potential to cause direct mortality of animals and to destroy active nests. Protective measures for migratory birds and state or federally listed species are mandated by the MBTA and the ESA, respectively, and are outlined in the ecological compliance review for this area (MSA-1903210).

Not all biological resources are considered mitigable resources at the Hanford Site (e.g., Level 0 and Level 1 resources [DOE/RL-96-32]). Mitigation plans for projects that do not exceed thresholds for rectification or compensation will be discussed in the project planning documentation, or project-specific ecological resources review, rather than in a MP. Avoidance and minimization mitigation actions will be the highest priority when reviewing project activities.

3 Mitigation of Impacts to Resources

Mitigation refers to a series of prioritized actions designed to minimize or lesson potential project impacts on natural and cultural resources. Mitigation activities include trying to avoid an impact entirely. When avoidance is not achievable, mitigation also includes minimizing the impact, rectifying the impact after the project has been completed, reducing or eliminating the impact over time, and/or compensating for impacts. Mitigation measures for biological resources are intended to meet the trust responsibilities of the DOE, Richland Operations Office under NEPA and the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*.

Mitigation of adverse impacts to biological resources via rectification and/or compensation is intended to ensure that there is no net loss of biological resources of concern on the Hanford Site. The objectives of mitigation for IDF are to keep the footprint of the facility as small as reasonably achievable, develop the facility on an as needed basis, and compensate for any loss to habitats of concern.

This chapter presents the compensatory mitigation that will be performed to mitigate for the loss of mature shrub-steppe habitat caused by the IDF expansion. The entire IDF expansion area was used to derive the compensatory mitigation measures identified in this chapter. Though the entire IDF expansion area may not be used for IDF project activities in the immediate future, all of the area was mitigated for in order to account for future use of the expansion area. For a description of past mitigation actions taken for the original IDF footprint, refer to DOE/ORP-2005-5 and subsequent Compensation Area Monitoring Reports (PNNL-16976, *Integrated Disposal Facility Sagebrush Habitat Mitigation Project: FY2007 Compensation Area Monitoring Report*; PNNL-17927, *IDF Sagebrush Habitat Mitigation Project: FY2008 Compensation Area Monitoring Report*).

The overall goal of this MP is to compensate for the 11.02 ha (27.24 ac) of mature sagebrush steppe habitat that may be disturbed as a result of IDF expansion. Compensative ultimately will be accomplished by performing habitat restoration work and installing artificial burrowing owl burrows, with the goal of creating habitat useful to key wildlife species.

3.1 Mitigation Ratios

A mitigation ratio, also referred to as a replacement ratio, is defined as “the ratio of area over which mitigation measures are applied to the area receiving the adverse impacts” (DOE/RL-96-32). Mitigation ratios are determined to prevent a net loss of habitat value through mitigation measures. Habitat value is based on the ability of the environment to provide suitable foraging, nesting, or breeding habitat.

An appropriate mitigation ratio may be determined based on the difference between the impact area and the habitat improvement area or by the amount of value that can be added to an area by habitat improvements. The ratio may also be based on known or expected success and failure rates of mitigation efforts. A qualified biologist must determine the appropriate type and amount of mitigation needed to offset the impact. The mitigation ratios used will be governed on a site-specific basis, contingent upon the level of habitat present, as defined in the BRMP (DOE/RL-96-32). The current mitigation ratios are based on the most recent revision of the BRMP (DOE/RL-96-32), and are subject to change as the BRMP is revised or if the resource level of the area changes

The mitigation ratios for the IDF project area vary due to differences in habitat quality. The ecological review performed for this project classified the IDF project area as containing habitat areas Level 0 to Level 4. Removal of Level 2, Level 3, and Level 4 habitat will result in compensatory mitigation. Table 1 lists mitigation ratios and applicable compensatory mitigation requirements for both the 2018 and 2019 expansions.

Table 1. Compensatory Mitigation Acreage Requirements

BRMP Level	Replacement Ratio	Acres Impacted by IDF Expansion ha (ac)	Compensatory Mitigation Required ha (ac)
4	5:1	9.47 (23.41)	47.35 (117.0)
3	3:1	0.27 (0.67)	0.81 (2.00)
2	1:1	1.28 (3.16)	1.28 (3.16)
Total Area			49.44 (122.17)

BRMP = Biological Resources Management Plan

IDF = Integrated Disposal Facility

3.2 Natural Resource Mitigation

The following sections describe the mitigation actions for the proposed project activities. The mitigation actions include avoidance, minimization, and compensatory mitigation actions.

3.2.1 Avoidance and Minimization of Impacts

Avoidance and minimization considerations were made during the initial site selection process for the IDF expansion area. Efforts will be made during all future construction, infrastructure development, and mitigation implementation activities to minimize impacts to habitats of concern and avoid unnecessary

adverse impacts. All project staff and supervisors are required to follow the requirements set forth in the ecological compliance review throughout all construction activities.

3.2.2 Compensatory Mitigation

The first mitigation goal is to replace the sagebrush habitat lost from IDF expansion. Using the replacement ratios in the most recent revision of the BRMP (DOE/RL-96-32), IDF expansion can be mitigated with 49.44 ha (122.17 ac) of revegetated areas. The goal of these revegetated areas would be to increase habitat quality of a degraded natural area on the Hanford Site in order to replace the lost biological resource of the sagebrush habitat at IDF.

The second mitigation goal is to replace lost habitat resources for burrowing owls. Burrowing owls nest <300 m (984 ft) away from the IDF expansion area, and the removal of habitat may affect this population. The installation of burrowing owl artificial burrows at a site in close proximity to the IDF expansion area will help mitigate for the loss of habitat.

The successful combination of these mitigation action goals will compensate for the loss of habitat associated with the expansion of IDF. Both of these mitigation action goals will require monitoring to ensure their success and may require intervention if monitoring indicates the mitigation is not successful. Monitoring and contingency planning is discussed in Section 3.4.

3.2.2.1 Revegetation

The largest impact the IDF expansion will have will be the removal of mature, undisturbed shrub-steppe habitat. Shrub-steppe habitat supports reptiles, mammals, and migratory birds, and is home to many species of grasses and forbs. The goal of revegetation will be to replace the shrub-steppe habitat in an area on the Hanford Site that will benefit shrub-steppe dependent species. Approximately 49 ha (122 ac) will need to be revegetated in order to compensate for this loss.

As of September 2019, MSA ecological monitoring has developed a comprehensive habitat assessment of the Hanford Site (HNF-64135, *Conservation Habitat Assessment and Mitigation Prioritization (CHAMP) for the Hanford Site: Identifying Priority Conservation Areas*). This assessment utilizes geographic and ecological data to identify areas that are highly suitable for revegetation and that will not be impacted by future project activities. A large habitat area was selected as a suitable candidate for mitigation projects requiring revegetation to improve degraded habitats. The improvement of this area will increase connectivity of shrub-steppe habitat on the Hanford Site and will support shrub-steppe dependent species. This mitigation area is located away from project activities and is not expected to be impacted by future Hanford Site cleanup efforts. The revegetation portion of IDF's mitigation actions will be focused in this habitat area and is expected to make a positive, lasting impact on the Hanford Site environment.

The revegetation will follow guidelines set forth in DOE/RL-2011-116, *Hanford Site Revegetation Manual*. MSA biologists will be consulted throughout the revegetation process to ensure a successful mitigation. The revegetation area will be prepared and seeded following the appropriate guidelines for the location and soil type. Shrub plugs will be planted at a rate of 1,500 plants/ha (600 plants/ac) and may include shrub species like big sagebrush, spiny hopsage (*Grayia spinosa*), and antelope bitterbrush at ratios appropriate to the soil type and environment. Forb plugs will be planted at a rate of 750 plugs/ha (300 plugs/ac) and will include at least two species of forb that are suitable for the soil type and surrounding habitat of the revegetation area.

The revegetation planning process will begin at least 1 year before the initiation of revegetation activities. After the revegetation site is identified, contracts for seed, shrub, and forb plugs will be put into place by MSA ecological monitoring staff or IDF staff. MSA ecological monitoring staff will work to initiate and

coordinate all revegetation activities. This mitigation action will require site selection, an implementation plan, revegetation activities, and follow-up monitoring to determine the success of the revegetation.

3.2.2.2 Artificial Burrow Systems

Burrowing owls have been observed nesting within 300 m (984 ft) of the IDF expansion area and likely utilize the natural habitat within the expansion area. The loss of shrub-steppe habitat directly adjacent to burrowing owl nest areas may negatively impact the owls, which have been declining on the Hanford Site (Wilde et al., 2017, *Hanford Site Burrowing Owl Monitoring Report for Calendar Year 2015*). In order to compensate for this lost biological resource, burrowing owl artificial burrow systems will be installed as part of this mitigation action. Artificial burrow systems historically do not have a 100% success rate with burrowing owl use (Wilde et al., 2017). In order to compensate for impacts to two burrowing owl burrows, IDF mitigation will include the installation of nine burrowing owl artificial burrows.

Areas suitable for the installation of artificial burrow systems will be identified by MSA ecological monitoring and compliance biologists. The burrows for IDF mitigation actions would be installed in three clusters of three burrows each. MSA ecological monitoring staff can work to coordinate all burrow procurement and installation activities once IDF requests initiating mitigation actions. This mitigation action will require site selection, an implementation plan, ecological and cultural clearance, excavation permitting, artificial burrow installation, and follow-up monitoring and maintenance for the burrows. Refer to Section 3.4 for more details regarding monitoring and maintenance.

3.3 Cultural Resource Mitigation

The site clearing and infrastructure development associated with IDF site construction and the sagebrush planting and installation of artificial burrow systems to be performed on the compensatory mitigation site(s) both have the potential to disturb historic properties. Potential impacts to cultural resources may include the inadvertent discovery of human remains, artifacts, or other cultural materials; impacts to traditional cultural properties; or impacts to historic sites. Therefore, each impacted site must be evaluated for the presence of cultural resources prior to initiating work in the field. A cultural resources review (CRR) was completed for the IDF project as a component of the larger Hanford Site Tank Farms EIS in 2007 (HCRC#2007-600-018, *Cultural Resources Review in Support of the Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Benton County, Washington*). Subsequently, a CRR for the updated areas required for IDF operation and maintenance was completed in 2018 (HCRC#2018-200-032, *Cultural Resources Review for Construction and Maintenance of the Integrated Disposal Facility [IDF] Components in the 200 East Area of the Hanford Site, Benton County, Washington*). In 2019, an amendment to the 2018 cultural review for the installation of additional utilities and roads in support of the IDF was completed (HCRC#2018-200-032A). The 2018 Area of Potential Effect notification for HCRC#2018-200-032 was sent to the Washington State Historic Preservation Office (SHPO) and Area Tribes on July 16, 2018. A cultural resource survey was completed for this project on August 27, 2018. Results of the CRR and survey indicated that two previously identified historic isolated finds were within the project area but not relocated in 2018. These sites were previously determined to be ineligible for inclusion on the National Register of Historic Places (36 CFR 60). A CRR with a “No Historic Properties Affected” designation as defined in 36 CFR 800.4(d)(1), “Protection of Historic Properties,” “Identification of Historic Properties,” was prepared and submitted to SHPO and Area Tribes for 30-day review on September 11, 2018. SHPO concurred with the finding of this CRR on September 11, 2018. As part of the amendment to project scope (HCRC#2018-200-032A), an amended Area of Potential Effect notification was transmitted to SHPO and consulting parties on April 14, 2019. A cultural resource survey for this amendment was completed on May 2, 2019, during which no cultural resources were identified. An Amended CRR with a

“No Historic Properties Affected” designation as defined in 36 CFR 800.4(d)(1) was submitted to SHPO and Area Tribes for 30-day review on June 20, 2019. SHPO concurred with the finding of this CRR on June 24, 2019.

While an unanticipated discovery is unlikely, all workers will be directed to watch for archeological or historic materials during work activities. If any cultural materials are encountered, work in the vicinity of the discovery must stop until a cultural resources specialist has been notified, the significance of the find assessed, appropriate consulting parties notified, and if necessary, arrangements made for mitigation of the find.

3.4 Mitigation Monitoring and Contingency Planning

Mitigation actions must be monitored to determine if they are successful. Monitoring is required for both revegetation and artificial burrows. If mitigation measures do not or are not projected to reach the goal of replacing lost biological resources, they will be deemed unsuccessful. Contingency plans will be developed if mitigation measures are found unsuccessful.

Revegetation site monitoring will follow guidelines in DOE/RL-2011-116. This document provides guidelines for collecting data on total native plant cover and shrub survival. Both components are essential in determining if a site will provide adequate shrub coverage and habitat for Hanford Site fauna. This monitoring will begin the first spring immediately after planting and continue for 5 years. If monitoring results indicate the site is not projected to provide adequate native plant or shrub cover, interventions such as supplemental shrub planting may take place to increase the likelihood of success.

Artificial burrowing owl burrows will require yearly maintenance from MSA biologists to ensure the burrow entrance is unblocked and the burrow is usable for a period of 5 years following installation. Maintenance will involve clearing the burrow entrance of heavy vegetation, along with clearing the entrance tunnel of spider webs, vegetation, soil, and other debris. Maintenance will occur prior to the spring arrival of migrating owls. Success of this mitigation action will be determined by burrow use and/or occupation by burrowing owls. The status of each burrow will be determined following methods in Wilde et al., 2017. If monitoring results indicate the artificial burrows are not being utilized by burrowing owls, a contingency plan will be developed.

4 Mitigation of Potential Dust Impacts from Construction Activities

Development of the IDF site may generate fugitive dust emissions as a result of surface and subsurface disturbance. This impact is routinely mitigated during all construction activities at the Hanford Site. Therefore, no special controls, long-term monitoring, or reporting will be required for dust mitigation other than standard best management practices.

4.1 Mitigation Activities

When soil is excavated, piled, conveyed, graded, or driven over, soil particulates are mechanically suspended in the atmosphere. Fugitive dust from construction activities requires action to reduce the level of entrainment into the air. Application of water or fixative to soil during construction and reseeded of disturbed areas following construction are two methods of construction dust control used on the Hanford Site.

Water and/or soil fixative will be used to control dust on roadways, excavation areas, and soil stockpiles, etc., during construction, as required. Construction areas that remain idle for long periods may be reseeded with a mixture of perennial grasses. Information regarding reseeded construction areas can be

found in DOE/RL-2011-116. Reclamation of the entire IDF site after site closure will likely be stipulated at a later date as part of the barrier and closure design.

4.2 Responsibilities

DOE will oversee compliance of its contractors with existing dust control mitigation requirements. Adequate dust control provisions will be stipulated in construction contracts and subcontracts.

4.3 Evaluation Criteria

The adequacy of dust mitigation will be measured visually onsite. The minimization goal is considered met when no continuously raised dust clouds from construction of the IDF site are visible.

4.4 Schedule

The IDF site should be pre-watered or continuously watered during construction to minimize airborne dust, especially during drier seasons. Based on Hanford Site experience, construction roads or other high traffic areas require water application two to three times per workday to effectively minimize dust clouds.

Idle, disturbed portions of the IDF site may be reseeded with sterile annual grasses for mid-term stabilization, or perennial grasses as a longer-term dust control option. Reclamation of the entire IDF site after site closure will be the final mitigation measure, and the species mix will likely be determined at a later date as part of the barrier or closure design.

4.5 Documentation

All IDF site construction contracts will contain provisions for dust control by water or soil fixative application. Per DOE requirements, contractors will use daily field reports to document dust control measures implemented and their effectiveness.

5 Conclusion

This MP fulfills mitigation commitments made in the HCP EIS ROD (64 FR 61615) to mitigate for impacts to biological or cultural resources consistent with resource-specific management plans. Therefore, this MP incorporates Hanford Site guidance contained in the BRMP (DOE/RL-96-32) and HCRMP (DOE/RL-98-10). This MP was also prepared in compliance with the Council on Environmental Quality Implementing Regulations (40 CFR 1500-1508) for NEPA and NEPA regulations (10 CFR 1021). This MP is technically adequate and satisfies the applicable requirements of the Council on Environmental Quality and DOE, pursuant to NEPA.

6 References

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