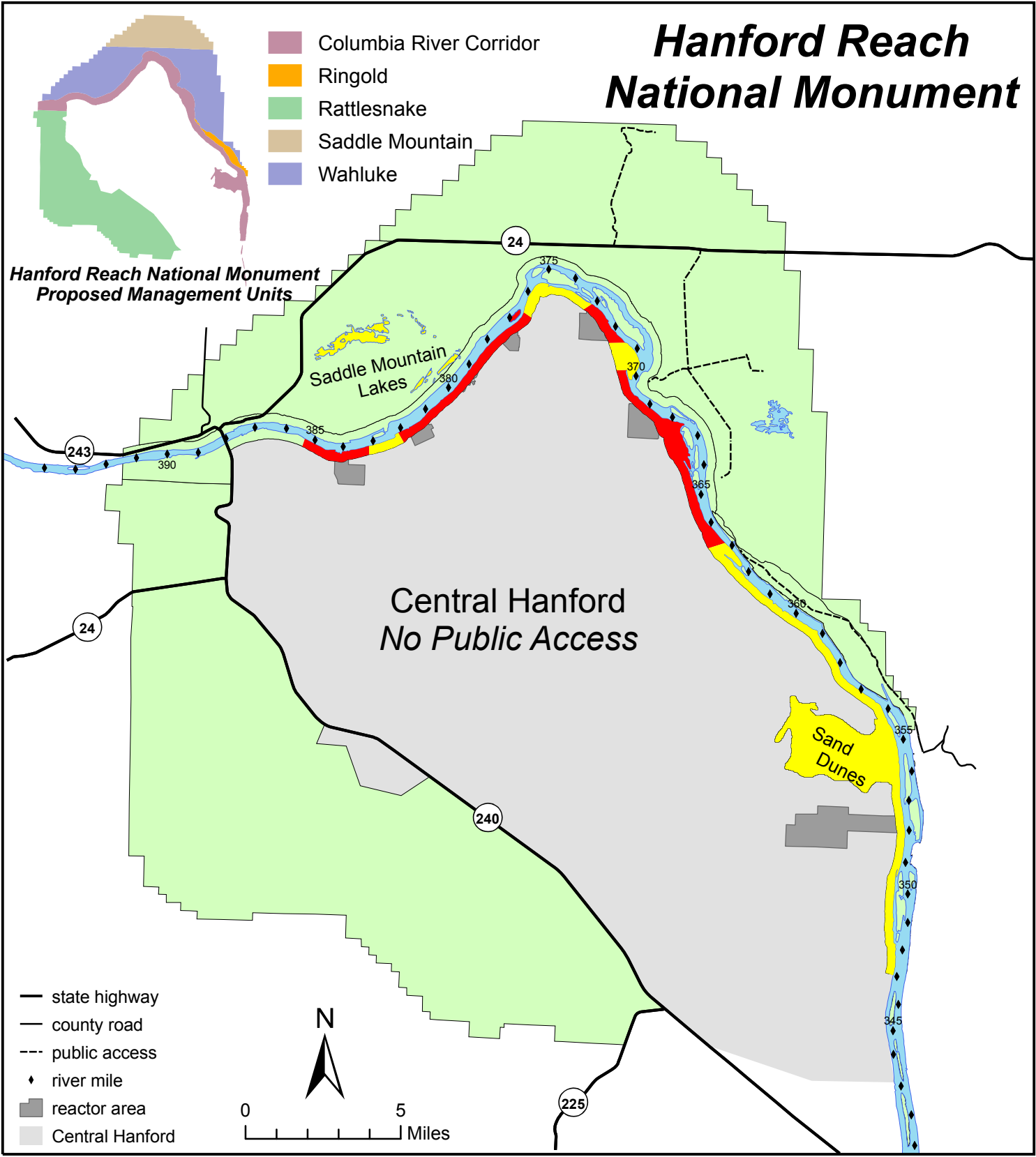


# Hanford Reach National Monument



**Green Areas:** No restrictions on activities due to contamination. Other restrictions may apply.

**Yellow Areas:** Some restrictions on activities due to surface or groundwater contamination. Comply with restrictive postings in these areas.

**Red Areas:** Activities are restricted due to contamination or cleanup activities.

## Current Uses and Restrictions at the Hanford Reach National Monument

### Introduction

The Hanford Site was established in 1943 to produce plutonium for nuclear weapons. Five decades of production resulted in large quantities of radioactive and hazardous waste being produced. As a result of routine production methods and accidents, some of this waste was released to the air, soil, groundwater, and Columbia River. Nuclear material production ended in the late 1980s and since then cleanup has been the main activity.

The Hanford Reach National Monument (HRNM) was established by Presidential Proclamation on June 9, 2000. The HRNM comprising 306 square miles is a substantial portion of the 586 square mile Hanford Site. The U.S. Fish and Wildlife Service (USFWS) manages much of the HRNM under a permit and Memorandum of Understanding for the U.S. Department of Energy (USDOE).

Although most areas of the HRNM do not contain chemical or radioactive hazards that would render certain visitor activities unsafe, there are other restrictions to visitor use. None of the activities and visitor use areas provided for in the USFWS management plans would expose people to an unsafe chemical or radiological risk from Hanford contamination. Visitor activities beyond those identified in the USFWS management plans may expose people to the contamination hazards identified herein, as well as other hazards such as physical hazards from old buildings, old wells, sharp metal, and broken glass.

### Visitor Restrictions on the Monument

The HRNM is divided into five distinct administrative units for management purposes. The units are designated as the Wahluke Unit, Saddle Mountain Unit, Rattlesnake Unit, Ringold Unit and the Columbia River Corridor Unit. For purposes of defining the current and historic contamination areas on the Hanford Reach National Monument a map with a color code system is attached. The map legend depicts areas of green, yellow and red.

**Green Areas:** No restrictions on activities due to contamination. Other restrictions may apply.<sup>1</sup>

**Yellow Areas:** Some restrictions on activities due to surface or groundwater contamination. Comply with restrictive postings in these areas.<sup>2</sup>

**Red Areas:** Activities are restricted due to contamination or cleanup activities.<sup>3</sup>

## **Upland Areas**

Several isolated sites on the Rattlesnake, Saddle Mountain, and Wahluke Units were contaminated from past activities associated with the operation of surface-to-air anti-aircraft missile sites and, in the very early years, gun emplacements. These sites were maintained 24 hours a day seven days a week and included barracks, kitchens, dining rooms, and offices as well as weapons maintenance and storage areas. These sites were contaminated through the use and disposal of DDT and by debris left behind when military operations ceased. These sites have been cleaned up to support unrestricted use. As a result, the entire Rattlesnake, Saddle Mountain, and Wahluke Units are identified as “Green” on the map.<sup>4</sup>

Saddle Mountain Lakes is defined as a “yellow” area because several DDT-related compounds have been detected in fish and a recent release of DDT may be present (Embrey, S. S. and E. K. Block, 1995. U. S. Geological Survey Water – Water Resources Investigations Report 95-4007 144 pp.)

These areas on the Monument, as well as all current and former agricultural areas on or adjacent to the Monument, have traces of metals and organochlorines from the early uses of pesticides. Because of this practice, slightly elevated levels of lead and arsenic can be measured in these soils.

## **Reactor Areas**

On the south shore of the Columbia River, six nuclear reactor areas containing nine reactors were constructed and operated during various times from 1944 to 1987. The reactors produced plutonium, and during the production process, a host of radioactive and hazardous elements were released to the environment, much of which ultimately ended up in the Columbia River. Throughout the history of the site, over 65 radioactive elements were released to the environment. Most of these radioactive elements are no longer a matter of concern because they have decayed away (short half-life). Others, due to their relative abundance and persistence (longer half-life) are now the primary radiological contaminants of concern. These include strontium-90, tritium, cesium-137 and cobalt-60. These and other radionuclides are monitored as part of the surveillance program by DOE and the Washington Department of Health (WDOH) to assure compliance with federal and state regulations. Also of interest would be chromium, a non-radioactive contaminant of concern, which was used in the reactors’ piping to limit corrosion.

Contamination is being removed at these former reactor sites which are all identified as “Red” on the guide map. Cleanup consists of demolition and removal of contaminated buildings, excavation of contaminated earth, underground utilities (especially pipes), and former landfill sites, with ongoing groundwater treatment. The contaminated materials are taken to central Hanford and disposed in an approved landfill. The highly radioactive reactor compartments at each reactor site are being sealed with concrete and steel for interim safe storage, and may be fully removed at a future date. Chain link fences and warning signs will be placed around each reactor.

## **Columbia River Shoreline**

There is contaminated groundwater between some of the former reactor sites and these areas are marked “Red” or “Yellow” based on concentrations of contaminants and safety issues inherent from ongoing operations and groundwater cleanup. The highest concentrations of chemicals and radionuclides in the HRNM are in and around these former reactor areas.

The shoreline on the reactor side (south and west shore) of the Hanford Reach within the Monument is conditionally accessible to visitors up to the mean high water mark in most locations except in those areas where reactor and reactor-related cleanup is ongoing.<sup>5</sup>

In an emergency situation, individuals on boats can access all shoreline on the Hanford Reach. Individuals experiencing life-threatening emergencies, may request help by dialing Hanford Patrol at 509-373-3800. Please note, Hanford Patrol and the USFWS are not prepared to rescue by boat. For rescue by boat contact the Benton County Sheriff at 786-5605 or call 911.

The area downstream of the last nuclear reactor, from river mile 363 (one mile upriver from the wooden-pole powerline) to river mile 360 (one mile north of the active sand dunes), contains primarily non-radiological waste sites associated with the former Hanford townsite and construction camps which were occupied during the construction of the Hanford nuclear site. Many of these mostly small household or construction type waste sites are located adjacent to the river and in the shrub-steppe areas near the river. These waste sites are not contaminated with radionuclides or process chemicals and are colored “Yellow” on the guide map. As in the Rattlesnake and Saddle Mountain areas of Hanford, pesticide residues may be present in the soils due to agricultural activities. The majority of the cleanup in this area is planned to occur during 2005-2008. Following cleanup this area will be reevaluated and may have no restrictions.

The area from approximately river mile 363 (noted above) to about river mile 356 is colored “Yellow” because the groundwater in this area is contaminated above drinking water standards due to contamination from central Hanford moving to the river through an underground aquifer. This precaution is being taken so the public will have limited access to this groundwater where it enters the river through seeps and springs. Historically, due to production waters migrating from central Hanford these seeps and springs had flow rates in gallons per minute. Today flow rates are greatly reduced and they are often only visible when the river is low. Even though these springs and seeps contain contaminants from past operations and possibly also from remobilization of contaminants due to current cleanup activities they are not generally considered a health hazard to the visitor. It is unlikely that a visitor would ingest enough water from these springs and seeps to be harmful. However, it would be best not to consume water from any seep, spring, irrigation canal or the Columbia River on the HRNM. The only obtainable public drinking water on the HRNM can be found at the Vernita Rest Stop located on State Highway 24 near the Columbia River.

## **Cleanup Issues and Sources of Additional Information**

The process used to remediate an area designated as a National Priority List (NPL) site within the Hanford Site is governed by a series of steps within the Comprehensive Environmental

Response, Compensation, and Liability Act (CERCLA). Washington Department of Ecology (WDOE), U.S. Environmental Protection Agency (EPA) and U.S.DOE as the Tri-Parties agree to cleanup actions under CERCLA for Hanford. Each waste site or Operable Unit (OU) at Hanford is or will be covered by a Record of Decision in the future that prescribes the actions to be taken to remediate the hazards. After remediation is complete a formal request is made to remove the waste sites from the NPL. The actions taken and the results of each action are maintained in the Administrative Record for each OU and can be accessed at the Consolidated Information Center at the Washington State University campus Richland, Washington. DOE will also conduct a radiological clearance of the property to meet internal requirements. An institutional control plan has been written which contains monitoring requirements to assure effectiveness of the remediation and requirements for signs and fences to provide notification and prevent access to more contaminated areas.

The USDOE maintains a comprehensive environmental monitoring system to determine what levels of contaminants are present in the environment. Routine effluent monitoring is conducted at and adjacent to Hanford Site facilities. In addition, an environmental surveillance program monitors the ambient air, soil, biota, and water distant from the facilities. The information gained from these programs confirms that DOE operations and cleanup activities are not adversely affecting the human population or the environment. Visitors can use the site as described in the Comprehensive Conservation Plan with no adverse health risks.

As part of the biota monitoring program game species including deer, waterfowl, and fish are analyzed for Hanford derived contaminants. The information obtained from this program shows that the consumption of wildlife and fish harvested from the Monument does not pose a threat to humans. Consumption of game animals and fish taken on those areas of the Monument where such takings are permitted should be undertaken with the same precautions as consumers would take in other areas of the state. Many of the game species and fish found at Hanford are resident at the site only during a portion of their life cycle and may have been exposed to environmental contaminants off the Monument. To date, tissue samples collected from common game animals and fish within and adjacent to the Monument have not shown concentrations of contaminants that present a health risk. However, the historic use of chemicals in industry and agriculture across the state have introduced a variety of chemical contaminants into the food chain and consumption of any wild species should be undertaken in recognition of the uncertainty of the prior exposures of any individual animal or fish consumed. Ongoing studies of game species and other biota at Hanford and the Monument will be shared with the public as the findings become available.

The USDOE produces the annual Hanford Site Environmental Report which summarizes the environmental monitoring data, potential exposure to the public, and the status of the cleanup operation. A copy of the report can be obtained by contacting (509) 372-1261 or viewed on the Internet at <http://hanford-site.pnl.gov/envreport>. The WDOH also provides independent monitoring of the environment in and around the Hanford Site. Please access <http://www.doh.wa.gov/ehp/rp/default.htm> for additional information.6

## Summary

A visitor will not be exposed to elevated levels of Hanford derived contaminants which could become a human health issue unless they access specific areas illegally or perform activities that are prohibited on the HRNM.

Footnote 1: The determination of no restrictions for human activity is based on historic information that these areas were not contaminated or information that these areas have been radiologically and chemically cleared and do not exceed contaminant levels of concern to EPA, WDOE and DOE. References: DOE Administrative Record [[www2.hanford.gov/arpir](http://www2.hanford.gov/arpir)]; Draft Report Radiological Clearance of Select Hanford Reach National Monument Lands [[http://www.pnl.gov/main/publications/external/technical\\_reports/PNNL-14622.pdf](http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14622.pdf)]; Hanford Site Annual Environmental Reports 1959 to present [<http://hanford-site.pnl.gov/envreport>].

Footnote 2: Some restrictions apply due to the potential that visitors might be exposed to slightly elevated radiological or chemical concentrations. The contamination in these areas has not yet been fully quantified but is expected to be low or nonexistent based on current monitoring data and historic records. Some areas colored “Yellow” in the Columbia River Corridor Unit contain subsurface contamination or contaminated groundwater that is isolated from normal visitor contact. Disturbance of surface soils in these areas is prohibited. References: Hanford Site Annual Environmental Reports 1959 to present.

Footnote 3: These areas exceed or potentially exceed contamination criteria for exposure to the public and are active construction sites.

Footnote 4: The Wahluke Unit, Saddle Mountain Unit, and Rattlesnake Unit have been deleted from the NPL. These areas have also been surveyed by USDOE for radiological release. References: USDOE Administrative Record; Draft Report Radiological Clearance of Select Hanford Reach National Monument Lands.

Footnote 5: A joint study by the USDOE and the WDOH concluded in a 1998 report titled, “Survey of Radiological Contaminants in the Near-Shore Environment at the Hanford Site 100-N Reactor Area, PNNL-11933” that the estimated doses to humans and biota were insignificant for people engaged in recreational activities along the shoreline. The Hanford Site Annual Environmental Report also contains much data that shows that there is little exposure due to direct radiation along the south and west shore of the Hanford Reach. D Island has not been cleared for visitor activities and remains posted. Access to all islands is restricted to protect sensitive cultural and biological resources.

Footnote 6: The human health evaluations and recommendations made in this fact sheet are made by the USDOE, EPA, WDOH, and WDOE. Any human health related question concerning potential exposure from former Hanford operations should be directed to these agencies. Contact information is as follows: USDOE 509-372-1261 or 509-373-5985, EPA 509-376-6865 or 509-376-8631, WDOE 509-372-7950 and WDOH 509-946-0564 or 360-236-3251.