

## Introduction

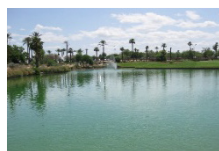
Superfund site cleanup and reuse can result in restored value to site properties and surrounding communities. Sites in reuse and continued use can revitalize a local economy with economic benefits such as jobs, new businesses, tax revenues and local spending. New or restored ecosystems on site can generate important economic benefits by producing a range of services – timber, purification of surface water and recreation opportunities, among others. While the exact value of these ecosystem services can be challenging to measure, they provide significant and substantial benefits to communities. This case study explores how ecosystems generate economic benefits and provides examples of ecosystem services at Superfund sites across the country.



**Subsistence fishing –  
Portland Harbor,  
Washington State**



**Timber production –  
Black Butte Mine,  
Oregon**



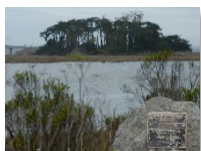
**Groundwater  
reclamation –  
Phoenix-Goodyear  
Airport Area, Arizona**



**Erosion control –  
Bunker Hill Mining and  
Metallurgical Complex,  
Idaho**



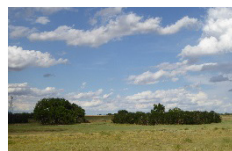
**Pollinator habitat –  
Palmerton Zinc Pile,  
Pennsylvania**



**Cultural heritage – Indian  
Island, California**



**Recreational fishing –  
California Gulch, Colorado**



**Bird watching –  
Rocky Mountain Arsenal,  
Colorado**



**Educational experiences –  
Sangamo Electric Dump/Crab Orchard  
National Wildlife Refuge, Illinois<sup>1</sup>**

## Beneficial Effects Highlights

- Several Superfund sites, including Portland Harbor and Commencement Bay Nearshore/Tideflats, impact waterways that support subsistence fisheries. Nationwide, the value of fish populations managed for subsistence is an estimated \$301 million.<sup>1</sup>
- The Palmerton Zinc Pile site supports a 450-acre native prairie and habitat gardens that attract pollinator species such as hummingbirds, bees, butterflies and other insects. There are over 160 Superfund sites in ecological use that contribute to pollinator habitat.<sup>2</sup> In 2009, native insect pollinators in the United States produced crop benefits worth more than \$9 billion.<sup>3</sup>
- At the California Gulch site in Leadville, Colorado, over 100,000 recreational anglers fished the cleaned-up waters of the Upper Arkansas River in 2012. Many Superfund sites impact waterways, including large and high-profile cleanups such as the Hudson River PCBs site, the Kalamazoo River Project and the Savannah River site. In 2011, 14 percent of Americans participated in fishing. Fishing expenditures contributed \$41.8 billion to the economy.<sup>4</sup>

<sup>1</sup> IL Crab Orchard National Wildlife Refuge wetlands (<https://flic.kr/p/c4cwMW>) by US Fish and Wildlife Service, CC BY 2.0 (<https://creativecommons.org/licenses/by/2.0/>)

## Economic Value of Ecosystem Services

Ecosystem is the term ecologists use to describe the dynamic interactions of plant, animal and microorganism communities with one another as well as their environment. An example of an ecosystem is a grassland. In a grassland ecosystem, shrubs, grasses, animals, insects and microorganisms interact with each other every day. The components of their environment – such as the amount of rainfall and availability of sunlight – have a major impact on how they live, interact and adapt over time.

Ecosystem services are the benefits provided to communities by these ecosystems. These services provide people with tangible benefits – timber for making furniture, for example – as well as intangible benefits such as inspiration to create art. Ecosystem services make possible much of the food that people eat as well as clean water, regulation of air quality, crop pollination and many recreation activities, such as whitewater rafting. Measuring the services and quantifying their economic value informs many projects and policies in the United States, from national rulemaking to site-specific decision-making.

### *Ecosystem Valuation and Natural Resource Damage Assessments*

The Natural Resource Damage Assessment and Restoration Program is separate from EPA's Superfund process. It is overseen by the U.S. Department of the Interior, along with state, tribal and other federal partners, which act as trustees for injured natural resources.<sup>5</sup> The goals of the program are to:

- Identify injured resources and determine the extent of injuries.
- Recover damages from responsible parties.
- Plan and carry out natural resource restoration activities.

This process involves identifying, measuring and quantifying the baseline value and reduction in services provided by the injured resources, in order to determine appropriate compensation.<sup>6</sup> The program is one example of economic valuation at work every day in environmental policymaking.

Measuring the economic value of ecosystem services can be complex. Some services – such as fish and timber – have market values, because they can be bought and sold. However, people's willingness to pay for the opportunity to enjoy a view, for example, is more difficult to measure. Economists use a variety of tools to identify people's preferences and the value they place on more intangible services. They can examine prices of related goods in the market, such as the price difference between a home with a great view and a comparable home without the view. In some cases, they measure the cost of avoiding the adverse effects that would result if the services were not available, like the cost of damages from floods. In other cases, they use surveys to ask people about their preferences based on hypothetical scenarios, such as how much they value the existence of an endangered species. Together, these tools help economists provide more complete information about the economic impacts of policies and help inform site-specific decision-making.

### *EPA's Final Ecosystem Goods and Services Classification System*













In 2013, EPA developed a detailed classification system for ecosystem services, the Final Ecosystem Goods and Services Classification System. It provides a framework through which ecosystem services can be identified and associated with a beneficiary, which helps minimize double-counting and links the services directly with human users.<sup>7</sup>

## Beneficial Effects of Ecological Reuse at Superfund Sites in Reuse

Superfund cleanups often include efforts to restore ecosystems that have been damaged or destroyed by contamination. Today, hundreds of Superfund sites support ecological reuses, from grassland habitats to wetlands and forests. Ecological reuse of Superfund sites allows communities to reclaim lost land, provides important habitat, creates green space, protects water resources, improves property values, sequesters carbon and helps remove the stigma associated with formerly contaminated lands.

The following examples explore how ecological uses at Superfund sites provide important and economically valuable ecosystem services in communities (Table 1). The examples are organized by the major types of services – provisioning services, regulating services, cultural services and supporting services.<sup>8, ii</sup> They represent a wide range of ecosystems, beneficiaries and ecosystem services.

**Table 1. Ecosystem Service Examples in this Case Study**

Category	Ecosystem	Beneficiary	Ecosystem Service	Superfund Site <sup>iii</sup>
Provisioning		Food Subsisters	<b>Fish</b> – fish supplies as food source	Portland Harbor
		Timber Extractors	<b>Timber</b> – supports timber production for commercial use or sale	Black Butte Mine
		Irrigators	<b>Water</b> – clean water for irrigating fields	Phoenix-Goodyear Airport Area
Regulating		Property Owners	<b>Erosion control</b> – opportunity for placement of infrastructure and reduced risk of erosion	Bunker Hill Mining and Metallurgical Complex
		Farmers	<b>Pollinators</b> – pollination services	Palmerton Zinc Pile
Cultural		Spiritual and Ceremonial Participants	<b>Cultural and spiritual experience</b> – Wiyot Tribe holds important tribal ceremony after 150-year absence	Indian Island
		Anglers	<b>Fish</b> – increased trout population brings more recreation spending	California Gulch
		Experiencers and Viewers	<b>Viewscapes</b> – opportunity to experience environment and wildlife	Rocky Mountain Arsenal
	   	Educators and Students	<b>Education</b> – opportunities to understand, communicate and educate	Sangamo Electric Dump/Crab Orchard National Wildlife Refuge

### Ecosystem Types Legend



Forests



Grasslands



Lakes and Ponds



Rivers and streams



Groundwater



Wetlands



Agroecosystems

<sup>ii</sup> Supporting services include those services provided by ecosystems that support other ecosystem services, such as photosynthesis. As their value is accounted for in the value of other services, these services are not discussed separately.

<sup>iii</sup> See Appendix A for links to more information about these sites.

## Provisioning Services

Provisioning services are the energy or materials outputs of an ecosystem that are consumed by humans. These include basic resources such as food, fiber, fuel and fresh water, as well as genetic material, resources used in pharmaceuticals, and ornamental materials like shells and flowers.<sup>9</sup> Provisioning services can be the most straightforward ecosystem services to value. This is because, in most cases, it is possible to determine marketplace values for the products. Superfund sites across the country provide a wide range of provisioning services, including timber, groundwater and fish.



### **Subsistence Fishing in Rivers and Streams: Portland Harbor**

Subsistence fishing – fishing done primarily to feed a person and their family – is an important activity in America’s waterways. Several Superfund sites impact waterways that support subsistence fisheries. For example, the Portland Harbor site in Oregon is a 10-mile stretch of the Lower Willamette River in which water, sediments and fish have been contaminated by 150 years of industrial use. Contamination, including heavy metals, dioxin and pesticides, affects over 35 species of fish – including chinook salmon, coho salmon and steelhead trout – and shellfish that live in the river.<sup>10</sup> The site’s health assessment identified fish consumption as a health risk, especially for recreational and subsistence fishers.<sup>11</sup> EPA is working with local stakeholders to coordinate reuse with long-term cleanup planning for the site.

Nationwide, the value of fish populations managed for subsistence is an estimated \$301 million.<sup>12</sup> The value of subsistence fishing for Native Americans in the Great Lakes and Upper Mississippi and Ohio river basins is \$15,000 to \$16,000 per year for each subsistence household.<sup>13</sup>

In these communities, fishing is a major source of food and income, and has significant cultural and social value as well. Many Superfund sites impact waterways, including large and high-profile cleanups such as the Hudson River PCBs site, the Kalamazoo River Project and the Savannah River site. Other Superfund sites that impact subsistence fisheries include:

- **Commencement Bay Nearshore/Tideflats (Tacoma, Washington):** Part of a tribal “usual and accustomed” harvest area, the site’s tidal areas support important tribal fisheries.<sup>14</sup>
- **Adak Naval Air Station (Adak, Alaska):** Institutional controls advise against subsistence fishing in two water bodies.<sup>15</sup>



### **Timber Production in Forest Ecosystems: Black Butte Mine**

Several Superfund sites support active timber harvesting operations or will in the future. The Black Butte Mine site near Cottage Grove, Oregon, is a former mercury mining operation. Mining operations and improper waste disposal practices contaminated soil, sediment, surface water and groundwater at the site with metals. EPA is preparing for cleanup, assessing the nature and extent of site contamination, and determining appropriate



Figure 1. Waters in Portland Harbor are part of a subsistence fishery.



cleanup options.<sup>16</sup> Purchased by a timber company in 1990, the site now supports wildlife habitat. Once cleaned up, it will also support timber harvesting.<sup>17</sup>

According to a 1997 study, total ecosystem goods and services generated by temperate and boreal forests had an annual global value of \$894 billion. Based on this calculation, the 520 million acres of these forests in the United States would have an annual value of over \$63 billion.<sup>18</sup> In the Southeast alone, non-timber products produced by forest ecosystems, such as foods and fibers, are valued at \$300 million per year.<sup>19</sup> In 2014, over 9,100 private businesses operated in the forestry and logging sector, employing over 38,000 people.<sup>20</sup> In 2002, the forest products sector generated \$300 billion, nearly \$58 billion of which went to payrolls (2005 dollars).<sup>21</sup> Superfund sites that support timber harvesting include the Alabama Army Ammunition Plant in Talladega County, Alabama. Part of this cleaned-up ammunition facility supports occasional logging.<sup>22</sup>



Figure 2. The Black Butte Mine site will support timber production.

*In addition to food, fiber and timber, forests generate other important ecosystem services. The consumptive use value of all water produced from national forests is \$27 billion per year.<sup>23</sup>*



#### **Groundwater Suitable for Irrigation Use: Phoenix-Goodyear Airport Area**

Formerly contaminated groundwater is now in productive use at the Phoenix-Goodyear Airport Area site, which covers 35 square miles in Goodyear, Arizona. Aircraft maintenance and military manufacturing activities had contaminated the area with solvents and chromium; ongoing cleanup activities include the extraction and treatment of groundwater.<sup>24</sup> Treated groundwater is a valuable resource in this arid region. It is used to water 16 ballfields, saving the City of Goodyear \$200,000 a year. The city transports excess water to the Buckeye Water Conservation and Drainage District for other uses.<sup>25</sup>

Groundwater accounts for over 22 percent of the nation's fresh water supply. Over 39 percent of Americans regularly depend on groundwater as their source of drinking water.<sup>26</sup> Groundwater is a vulnerable water source because it is often the single source of drinking water in arid regions and is difficult to clean up. Valuation of water resources is complicated and based on many factors, including source, sector and location, resulting in estimates ranging from \$1 to \$4,500 per acre-foot.<sup>27</sup> Superfund sites with groundwater reclamation include:

- **Lexington County Landfill Area (Cayce, South Carolina):** Groundwater from this former municipal landfill is used for land irrigation.<sup>28</sup>
- **Hastings Groundwater Contamination (Hastings, Nebraska):** Treated groundwater is used at USDA's Meat Animal Research Center for watering plants, crops and animals.<sup>29</sup>



Figure 3. The Phoenix-Goodyear Airport Area site.

## Regulating Services

These services are the benefits that come from the regulation of ecosystem processes – the services that keep the environment stable and hospitable for habitation. These services include the regulation of air quality, climate, water, erosion, disease, pests and natural hazards as well as water purification and pollination.<sup>30</sup>

Quantifying the value of regulating services is more complicated than valuing tangible material outputs. One useful strategy is to calculate the value of the replacement cost for the service. For example, people can calculate the cost to build and operate a wastewater treatment plant that can treat the same volume of water as a wetland.

Ecosystems on Superfund sites provide valuable regulating services to nearby communities – reducing flood risks, controlling erosion, purifying drinking water, mitigating natural hazards and supporting pollinator populations.



### **Erosion Control in Forest Ecosystems: Bunker Hill Mining and Metallurgical Complex**

Erosion can fill reservoirs and waterways with sediment, reduce water quality, and damage roads and structures.<sup>31</sup> Cleanup and revitalization efforts at many Superfund sites include efforts to reduce erosion. At the Bunker Hill Mining and Metallurgical Complex site in Idaho, these efforts included the revegetation of 1,100 acres of hillsides with more than two million trees.<sup>32</sup> One of the largest mining sites in the world, the area has supported mining operations since 1883. Past mining, milling and disposal activities contaminated soil, sediment, groundwater and surface water with heavy metals. Contaminated soils eroded from exposed hillsides. The erosion carried contaminants into waterways. Today, these once-degraded hillsides are fully revegetated and healthy, supporting wildlife and pollinator habitat and controlling erosion.

One way to calculate the value of erosion control is by identifying the cost of repairing erosion damage. For example, sedimentation of reservoirs can substantially reduce the volume of water stored for communities. Addressing the damage requires either dredging the sediment or developing other water storage options. The estimated national annual cost of dredging sediment from inland waterways is \$257 million per year.<sup>33</sup> In Oregon's Willamette Valley alone, sedimentation results in annual costs of \$5.5 million.<sup>34</sup> Superfund sites cleanups that incorporate erosion control measures include:

- **C & D Recycling (Foster Township, Pennsylvania):** Cleanup of this former metal reclamation plant included erosion control measures and replanting. The site has been deeded as a nature conservancy trust for open space.<sup>35</sup>
- **Portsmouth Naval Shipyard (Kittery, Maine):** Ecological revitalization efforts at this naval facility included installation of shoreline erosion controls and wetland construction.<sup>36</sup>



**Figure 4. Erosion control at the Bunker Hill Mining and Metallurgical Complex site.**



### **Pollination: Palmerton Zinc Pile**

Pollinators – birds, bees, bats, butterflies, moths, beetles – carry pollen from flower to flower, resulting in fertilization and the development of fruits and seeds. As part of efforts by EPA and other agencies to respond to recent rapid declines in pollinator species, pollinator habitats have been incorporated as part of ecological restoration work at several Superfund sites. For example, the Palmerton Zinc Pile site in Palmerton, Pennsylvania, was once home to a zinc smelting operation that deposited millions tons of slag and heavy metals contamination across the surrounding valley, defoliating 2,000 acres of trees.<sup>37</sup> Today, the cleaned-up area supports a 450-acre native prairie and Lehigh Gap Nature Center, which provides habitat gardens that attract pollinator species such as hummingbirds, bees, butterflies and other insects.<sup>38</sup>

Pollinators make a substantial contribution to the U.S. economy. In 2009, for example, native insect pollinators in the United States produced crop benefits worth more than \$9 billion. Globally, the majority of the world’s most important food crops – accounting for 35 percent of total food production – depend on animal pollinators for reproduction.<sup>39</sup> It would be financially unsustainable and technically impracticable to replace the work contributed by these organisms. There are over 160 Superfund sites in ecological use that contribute to pollinator habitat, including:

- **Chemical Commodities, Inc. (Olathe, Kansas):** Collaboration with Monarch Watch, the Pollinator Partnership and community stakeholders resulted in the establishment of a pollinator prairie and garden habitat as part of the site’s post-cleanup revegetation.<sup>40</sup>
- **Landia Chemical Company (Lakeland, Florida):** Cleanup of this former pesticide facility included replanting with over 30 native species, which provide habitat for wildlife and pollinators.<sup>41</sup>



**Palmerton Zinc Pile**  
Palmerton, Pennsylvania



**Figure 5. Restored habitat at the Palmerton Zinc Pile site.**

### **Non-Use Value of Ecosystem Services**

At the broadest level, people can benefit from the existence value of a landscape and the flora and fauna it supports. Economists measure the value of this service through surveys that measure people’s willingness to pay. For example, many people care deeply about the survival and health of monarch butterfly populations. The willingness to pay for the existence of monarchs among U.S. households was calculated at a total one-time payment of \$4.8 billion to \$6.6 billion.<sup>42</sup>

## Cultural Services

Cultural services are the intangible, nonmaterial benefits that people enjoy from ecosystems. These services include spiritual enrichment, knowledge and education, inspiration, aesthetic experiences, sense of place, cultural heritage, and recreation.<sup>43</sup>

Valuing intangible ecosystem service benefits such as cultural services relies on a range of economic approaches. Some service values – such as material goods – can be quantified through market pricing (e.g., the economic activity associated with the outdoor recreation sector). Measuring the replacement cost of health services associated with increased recreation is another approach. Other services are valued by surveying the public about their preferences and their willingness to pay for different things.



### ***Cultural Heritage Associated with Wetland Ecosystems: Indian Island***

Ecosystems provide opportunities to enjoy spiritual, ceremonial or celebratory experiences in the environment. These experiences could include annual community events such as harvest or seafood festivals, religious observances and traditions, or personal spiritual experiences. For example, many Native American communities have deep connections with the places where they live and observe important cultural traditions. These experiences, however, do not have a market price. Exploration of cultural resource value can be important to developing a holistic understanding of overall ecosystem value when making management decisions. Such efforts require an interdisciplinary effort with contributions from anthropologists and other cultural specialists as well as economists.<sup>44</sup>

Many Superfund sites affect areas that are important cultural resources for different groups. For example, the Indian Island site on the Humboldt Bay in California was the historical site of the Wiyot Tribe's World Renewal Ceremony. An 1860 massacre forced remaining tribal members from the site. Years of shipbuilding followed, contaminating the soil and leaving behind millions of gallons of caustic pulping process liquors in unstable tanks. EPA collaborated with the Wiyot Tribe's Natural Resources Department to complete an emergency removal.<sup>45</sup> Following cleanup, in 2013, the Wiyot Tribe returned to the center of its cultural life, performing a ceremony that had not been held there for over 150 years.<sup>46</sup> Other sites with spiritual or ceremonial uses include:

- **Tar Creek (Ottawa County, Oklahoma):** Beaver Creek is a sacred resource vital to the Quapaw Tribe's cultural and religious practices. Tribal members gather food and ceremonial resources along the banks of Beaver Creek during the tribe's annual pow-wow.<sup>47</sup>
- **Northeast Church Rock Mine (near Gallup, New Mexico):** Near this abandoned uranium mine and mill tailings cleanup site, members of the Navajo Nation gather medicinal plants and hold ceremonies. The Red Water Pond Road Community also holds an annual uranium awareness and commemoration event.



Figure 6. The view of Indian Island from nearby Woodley Island.





### **Recreational Fishing in Rivers and Streams: California Gulch**

Outdoor recreation is a growing sector of the U.S. economy, and recreational fishing is an important part of this sector. Cleanups at Superfund sites across the country are helping to improve water quality and conditions for recreational fishing. At the 18-square-mile California Gulch site in Leadville, Colorado, runoff and mining-influenced waters once contaminated the waters of the Upper Arkansas River so heavily that parts of the waterway did not support fish life. Efforts to improve water quality, manage flows and improve habitat in the Arkansas River paid off. In January 2014, Colorado Parks and Wildlife designated a 102-mile reach of the river downstream from Leadville as Gold Medal Trout Waters, designating it as one of the best trout fisheries in the state. Colorado Parks and Wildlife calculates that over 100,000 anglers fished the waters between Leadville and Parkdale in 2012, contributing an estimated \$7.6 million in total direct economic benefits and \$18.2 million in net economic benefits per year.<sup>48</sup>



**Figure 7. Trout populations have rebounded at the California Gulch site.**

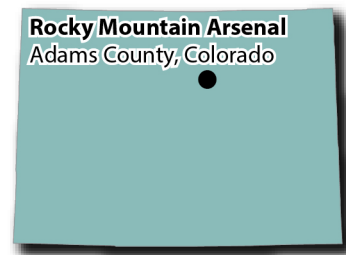
The value of outdoor recreation, which depends on healthy, high-quality ecosystems, can be measured using market pricing as well as other economic tools. The outdoor recreation sector contributed \$646 billion to the U.S. economy in 2012.<sup>49</sup> This spending includes the purchase of gear as well as travel-related spending, generating revenue in finance and insurance, professional services, warehousing, manufacturing, and other areas. Nationwide, outdoor recreation supports 6.1 million jobs and recreation-related spending generates \$39.9 billion in national tax revenue and \$39.7 billion in state and local tax revenue.<sup>50</sup> Fishing is a popular form of outdoor recreation; in 2011, 14 percent of Americans participated in fishing. Fishing expenditures contributed \$41.8 billion to the national economy.<sup>51</sup> Superfund sites that support recreational fishing include:

- **Onondaga Lake (Syracuse, New York):** Following the cleanup of contamination related to a hundred years of municipal and industrial sewage discharges, the lake now supports catch-and-release fishing, with over 60 species of fish thriving in the restored habitat.<sup>52</sup>
- **Wheeling Disposal Service Co., Inc., Landfill (Amazonia, Missouri):** This cleaned-up former sanitary and industrial landfill now supports wildlife habitat and provides recreational hunting and fishing opportunities.<sup>53</sup>



### **Birdwatching in America's Grasslands: Rocky Mountain Arsenal**

Birders – people who travel from home to view birds or who identify birds near where they live – account for about 20 percent of the U.S. population. In 2011, 46.7 million birders nationally spent \$40.1 billion on birding activities, generating a total of \$107 billion in total direct, indirect and induced effects, creating over 660 thousand jobs, \$31 billion in employment income, and \$13 billion in state and federal tax incomes.<sup>54</sup>



There are many bird-watching opportunities available at Superfund sites across the country. Ten miles northeast of Denver, the Rocky Mountain Arsenal site covers almost 27 square miles. Between the 1940s and 1980s, the area supported U.S. Army munitions production and private industry

pesticide production, resulting in widespread environmental contamination.<sup>55</sup> After cleanup, parts of the site were transferred to the U.S. Department of the Interior to become part of the National Wildlife Refuge system; the U.S. Fish and Wildlife Service is responsible for managing the wildlife and habitat.<sup>56</sup> The U.S. Army will retain control of areas where hazardous waste remains in place. Today, the Rocky Mountain Arsenal National Wildlife Refuge is one of the largest urban refuges in the country, supporting over 330 species of wildlife. Visitors enjoy opportunities to observe and photograph wildlife, participate in environmental education programs, fish, and drive along a self-guided wildlife tour.<sup>57</sup> Birders spot some of the 280 different species from the refuge's viewing blinds, along its trails, or during naturalist-guided birding programs. Superfund sites that offer bird-watching opportunities include:



**Figure 8. The Rocky Mountain Arsenal site provides excellent bird-watching opportunities.**

- **Fort Ord (Monterey, California):** Part of this decommissioned military base has been turned over to the Bureau of Land Management and designated as the Fort Ord National Monument.<sup>58</sup> It supports a diversity of habitats and provides bird-watching and other opportunities on 86 miles of trails.<sup>59</sup>
- **Times Beach (Eureka, Missouri):** The State of Missouri took ownership of this former dioxin site, creating Route 66 State Park.<sup>60</sup> Today, over 40 types of birds can be observed from the park's trails.<sup>61</sup>



**Education Opportunities: Sangamo Electric Dump/Crab Orchard National Wildlife Refuge**

Ecosystems support a wide variety of education and research opportunities for both educators and students. Research has found that, in a time when students spend much of their time indoors, outdoor education experiences can improve educational outcomes for participants, including building real-world problem-solving skills, increasing engagement in schoolwork, improving performance in math and science, and improving test scores.<sup>63</sup> Over time, increased education benefits the entire economy as well as the students. Economists link increases in the nation's educational attainment with increases in human capital, total economic output and incomes. With more human capital, the same number of people can produce more and more valuable goods, benefiting everyone.<sup>64</sup>

*An estimated 13 percent of U.S. income growth between 1929 and 1982 was the result of increased education levels.<sup>62</sup>*

Several Superfund sites support education facilities or experiences. The 43,500-acre Sangamo Electric Dump/Crab Orchard National Wildlife Refuge site is located five miles west of Marion, Illinois. Before and during World War II, U.S. Department of Defense manufacturing activities on site included explosives production, metal fabrication and plating. Improper waste disposal practices contaminated soil and groundwater with hazardous chemicals.<sup>65</sup> Today, areas of the site are in various phases of cleanup. The Refuge is now home to the Pigeon Creek Environmental Education Complex, which offers education programs coordinated with Illinois state science learning standards. Field trips are free of charge and include seasonal wildlife viewing activities customized for different age groups.<sup>66</sup>



At least eight sites support educational opportunities (see Appendix B), including:

- **DuPage County Landfill/Blackwell Forest Preserve (Warrenville, Illinois):** A multi-purpose recreation area developed following the cleanup of this 40-acre former landfill includes the Urban Stream Research Center, which provides space for the study of the DuPage River watershed and other waterways.<sup>67</sup>
- **Southside Sanitary Landfill (Indianapolis, Indiana):** Donated to the Indianapolis School Board in 2013, land at this cleaned-up former landfill now supports environmental education opportunities, including landfill science-related tours.<sup>68</sup>

## The Economic Value of Wetlands

This case study has described individual types of services provided by ecosystems. To get a holistic view of the value of a given ecosystem, it is important to understand that each ecosystem provides a range of different benefits all at once. For example, wetlands provide flood control, water quality improvement, fish and wildlife habitat, and recreation amenities (Table 2). A 1997 study estimated that, worldwide, wetlands provide \$14.9 trillion in ecosystem services.<sup>69</sup> A 2006 report on New Jersey's natural capital estimated values of \$8,700 and \$6,500 per acre for freshwater and saltwater wetlands, respectively, for a total value of \$10.6 billion per year in the state.<sup>70</sup> The economic value of specific wetland sites varies widely depending on location, habitat quality and other factors.

The economic value of specific services includes:

- **Flood Control:** Wetlands store and slowly release large volumes of water, providing natural flood control services. In Minnesota, the annual cost of replacing the flood control function of 5,000 acres of drained wetlands was estimated at \$1.5 million.<sup>71</sup>
- **Water Quality Control:** Wetlands improve the quality of water as it moves through an ecosystem and contaminants are filtered out. Quantifying the value of this service can be done by estimating the cost to purify the same water using a manmade system. For example, a 1990 study estimated that South Carolina's Congaree Bottomland Hardwood Swamp performed the same water purification services as a \$5 million treatment plant.<sup>72</sup>

Over 50 Superfund sites in reuse or continued use support wetland habitats (see Appendix B).

### ***Marathon Battery (Cold Spring, New York)***

The production of batteries and improper waste disposal practices at this 70-acre site in Cold Spring, New York, contaminated river sediments and marshes with high levels of heavy metals. Cleanup activities included demolition of the battery plant, removal of contaminated soils and removal of contaminated sediments from the wetlands and river. Today, Foundry Cove is a wildlife sanctuary and publicly accessible recreation area where residents and visitors enjoy the restored riverfront. In 1996, the Scenic Hudson organization acquired Foundry Cove. It is now part of the West Point Foundry Preserve, which is on the National Register of Historic Places. The Preserve reopened with new trails and facilities in 2013. Visitors walk and hike along trails that pass areas of historic and archeological interest. A dock offers a launching point for recreational canoeing and kayaking. Waterfowl and migratory birds also frequent the Preserve, which has become a popular spot for wildlife observation.

### **Nahant Marsh (Davenport, Iowa)**

A trap and skeet shooting range contaminated 70 acres of this 513-acre urban wetland with 243 tons of lead. EPA coordinated closely with the U.S. Fish and Wildlife Service and the community on a cleanup plan that would protect existing habitat, removing marsh sediments and shoreline soils that contained lead shot while making sure the wetlands continued to function properly. The agencies designed the marsh restoration to enhance its value to aquatic species and promote reestablishment of cattails and sedges.<sup>73</sup> Today, the restored marsh supports more than 150 bird species and 400 plant species as well as mammals, fish, reptiles, amphibians and insects.<sup>74</sup> The site is home to the Nahant Marsh Education Center, whose mission “is to preserve and enhance the ecological integrity of the marsh and to foster wonder, appreciation, interaction, and stewardship of the natural world through education.”

**Table 2. Ecosystem Services Provided by Wetlands<sup>75</sup>**

Category	Beneficiary	Importance to the Beneficiary
<b>Agricultural</b>	Irrigators	Water for growing and maintaining crops
	Livestock Grazers	Water and vegetation (e.g., salt, hay) for livestock consumption
	Aquaculturists	Conditions (e.g., water quality) for cultivating aquatic organisms
	Farmers	Suitable soil and conditions for the cultivation of crops; wild pollinators, depredators and (pest) predators that enable crop growth
<b>Commercial and Industrial</b>	Food, Timber, Fiber and Ornamental Extractors	Edible organisms, timber, fiber or ornamental products (e.g., duck, cypress, sphagnum, cattails, grasses, shells, dried flowers) for commercial use or sale
	Industrial Dischargers	Opportunity to discharge into the environment
	Resource-Dependent Businesses	Opportunity for placement of infrastructure; reduced risk of flooding, erosion and pest infestation
	Pharmaceutical Suppliers	Organisms used in medicines or sold for medicinal purposes
	Fur/Hide Trappers and Hunters	Organisms (e.g., beavers, alligators, snakes) that provide fur or hides for commercial use or sale
<b>Governmental, Municipal and Residential</b>	Treatment Plant Operators	Medium for discharging treated municipal wastewater into the environment
	Residential Property Owners	Opportunity for placement of infrastructure; reduced risk of flooding, erosion and pest infestation
	Military/Coast Guard	Opportunity for placement of infrastructure; suitable conditions for training activities
<b>Subsistence</b>	Food Subsisters	Edible organisms (e.g., fish, crawfish, ducks) or associated products that are gathered or hunted for personal use
	Timber, Fiber and Fur/Hide Subsisters	Timber, fiber or organisms (e.g., cypress, reeds, grasses, alligators) used for clothing/warmth, infrastructure, housing, roofing or fuel for personal use
<b>Recreational</b>	Experiencers and Viewers	Opportunity to view the environment and organisms; landscape, organisms, sounds and scents that provide a sensory experience
	Food Pickers and Gatherers	Edible organisms (e.g., crawfish, mussels) or associated products that are picked or gathered for personal use
	Hunters	Organisms (e.g., beavers, ducks, geese, alligators) that can be hunted
	Anglers	Fish in the water

Category	Beneficiary	Importance to the Beneficiary
	Waders, Swimmers	Opportunity and conditions for wading, swimming and diving
	Boaters	Opportunity, medium and conditions for recreational boating
<b>Inspirational</b>	Spiritual/Ceremonial Participants	Opportunity and conditions for spiritual and ceremonial practices and celebrations
	Artists	Inspiration for art; materials and sensory experiences used in art
<b>Learning</b>	Educators/Students	Opportunities to understand, communicate and educate
	Researchers	Research opportunities
<b>Non Use</b>	People Who Care	Knowing that the environment exists

## Conclusion

Ecosystem services generated by cleanup and ecological restoration of Superfund sites create economically important benefits to communities across the country, from marketable materials such as lumber, fish and reclaimed groundwater to less tangible resources such as cultural experiences and educational opportunities. Interdisciplinary efforts involving ecologists, economists and others to measure and calculate economic value of these services help provide a complete picture for policymaking and site-specific decision-making. EPA recognizes the value of ecosystems and the opportunity for improving ecosystem services during Superfund cleanups. Looking forward, EPA is moving toward quantitatively evaluating ecosystem services during the Superfund cleanup process and developing best management practices.

*For more information about EPA's Superfund Redevelopment Initiative, visit:  
<https://www.epa.gov/superfund-redevelopment-initiative>.*

## Sources

1. U.S. Fish & Wildlife Service. Net Worth: The Economic Value of Fisheries Conservation. Fall 2011. Retrieved from <https://www.fws.gov/home/feature/2011/pdf/Lowres2USFWSEconomicReport11-2%20b.pdf>.
2. Sites identified during an EPA Superfund Redevelopment (SURE) Information Library search in January 2016.
3. The White House, Office of the Press Secretary. Fact Sheet: The Economic Challenge Posed by Declining Pollinator Populations. June 20, 2014. Retrieved from <https://www.whitehouse.gov/the-press-office/2014/06/20/fact-sheet-economic-challenge-posed-declining-pollinator-populations>.
4. U.S. Fish & Wildlife Service. 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. FHW/11-NAT (RV). Revised February 2014. Retrieved from <https://www.census.gov/prod/2012pubs/fhw11-nat.pdf>.
5. U.S. Fish & Wildlife Service, Fisheries and Habitat Conservation. The Natural Resource Damage Assessment and Restoration Program: An Introduction. February 2005. Retrieved from [http://www.fws.gov/oregonfwo/Contaminants/PortlandHarbor/Documents/NRDAR\\_Program\\_2-10-05.pdf](http://www.fws.gov/oregonfwo/Contaminants/PortlandHarbor/Documents/NRDAR_Program_2-10-05.pdf).
6. Portland Harbor Natural Resource Trustee Council. Natural Resource Damage Assessment Process. December 2009. Retrieved from <http://www.fws.gov/oregonfwo/Contaminants/PortlandHarbor/Documents/NRDAPProcess.pdf>.
7. Landers, D. and A. Nahlik. Final Ecosystem Goods and Services Classification System (FECS-CS). U.S. Environmental Protection Agency. Washington, DC. EPA/600/R-13/ORD-004914. 2013. Retrieved from [http://cfpub.epa.gov/si/si\\_public\\_record\\_report.cfm?dirEntryId=257922](http://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=257922).
8. Millennium Ecosystem Assessment. Ecosystems and Human Well-being: Synthesis. Washington, DC: Island Press. 2005. Retrieved from <http://www.unep.org/maweb/documents/document.356.aspx.pdf>.
9. Ibid.
10. Oregon Department of Human Services. Portland Harbor, Fish and Public Health. Retrieved from <http://www.deq.state.or.us/lq/cu/nwr/portlandharbor/docs/DHSFishAdvisory.pdf>.
11. U.S. EPA. Portland Harbor Human Health Risk Assessment Summary. August 2013. Retrieved from [http://www3.epa.gov/region10/pdf/ph/sitewide/human\\_health\\_risk\\_assessment\\_factsheet\\_aug2013.pdf](http://www3.epa.gov/region10/pdf/ph/sitewide/human_health_risk_assessment_factsheet_aug2013.pdf).
12. U.S. Fish & Wildlife Service. Net Worth: The Economic Value of Fisheries Conservation. Fall 2011. Retrieved from <https://www.fws.gov/home/feature/2011/pdf/Lowres2USFWSEconomicReport11-2%20b.pdf>.
13. Great Lakes and Mississippi River Interbasin Study (GLMRIS). Treaty Rights and Subsistence Fishing in the U.S. Waters of the Great Lakes, Upper Mississippi River, and Ohio River Basins. June 2012. Retrieved from [http://glmris.anl.gov/documents/docs/Subsistence\\_Fishing\\_Report.pdf](http://glmris.anl.gov/documents/docs/Subsistence_Fishing_Report.pdf).
14. U.S. EPA. Site Information for Commencement Bay, Near Shore/Tide Flats. January 25, 2016. Retrieved from [http://cumulis.epa.gov/supercpad/cursites/dsp\\_ssppSiteData2.cfm?id=1000981](http://cumulis.epa.gov/supercpad/cursites/dsp_ssppSiteData2.cfm?id=1000981).
15. U.S. Navy. Naval Facilities Engineering Command, Northwest. Adak Island Update: Institutional Controls Education. August 2006. Retrieved from [http://www.adakupdate.com/pdfs/news/IC\\_EducationFactSheetAug2006.pdf](http://www.adakupdate.com/pdfs/news/IC_EducationFactSheetAug2006.pdf).
16. U.S. EPA. Site information for Black Butte Mine. June 7, 2016. Retrieved from <https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1001865&msspp=med>.
17. U.S. EPA. Optimization Review Black Butte Mine Superfund Site. EPA-542-R-12-003. July 2012. Retrieved from [https://clu-in.org/download/techdrct/blackbuttemine\\_optimizationreport\\_july2012.pdf](https://clu-in.org/download/techdrct/blackbuttemine_optimizationreport_july2012.pdf).
18. Douglas J. Krieger, Ph.D. Economic Value of Forest Ecosystem Services: A Review. The Wilderness Society. March 2001. Retrieved from

<http://www.sierraforestlegacy.org/Resources/Conservation/FireForestEcology/ForestEconomics/EcosystemServices.pdf>.


19. Ibid.
20. U.S. Department of Labor, Bureau of Labor Statistics. Industries at a Glance: Forestry and Logging: NAICS 113. January 20, 2016. Retrieved from <http://www.bls.gov/iag/tgs/iag113.htm>.
21. U.S. Department of Agriculture, Forest Service. Criteria and Indicators for Forest Sustainability: Indicator 6.40: Distribution of Revenues Derived from Forest Management. April 29, 2014. Retrieved from <http://www.fs.fed.us/research/sustain/criteria-indicators/indicators/indicator-640.php>.
22. U.S. EPA. Site Information for Alabama Army Ammunition Plant. January 25, 2016. Retrieved from [http://cumulis.epa.gov/supercpad/Cursites/dsp\\_ssppSiteData1.cfm?id=0400449#Why](http://cumulis.epa.gov/supercpad/Cursites/dsp_ssppSiteData1.cfm?id=0400449#Why).
23. Douglas J. Krieger, Ph.D. Economic Value of Forest Ecosystem Services: A Review. The Wilderness Society. March 2001. Retrieved from <http://www.sierraforestlegacy.org/Resources/Conservation/FireForestEcology/ForestEconomics/EcosystemServices.pdf>.
24. U.S. EPA. Site Information for Phoenix-Goodyear Airport Area, Goodyear, AZ. January 25, 2016. Retrieved from [http://cumulis.epa.gov/supercpad/cursites/dsp\\_ssppSiteData1.cfm?id=0900672](http://cumulis.epa.gov/supercpad/cursites/dsp_ssppSiteData1.cfm?id=0900672).
25. David Madrid. Goodyear Uses Once-Polluted Water on Ball Fields. The Arizona Republic. May 7, 2015. Retrieved from <http://www.azcentral.com/story/news/local/southwest-valley/2015/05/07/goodyear-uses-polluted-water-ball-fields/70892928>.
26. National Ground Water Association. Groundwater Use in the United States of America. January 4, 2016. Retrieved from <http://www.ngwa.org/Fundamentals/use/Documents/usfactsheet.pdf>.
27. U.S. EPA. The Importance of Water to the U.S. Economy: Synthesis Report. November 2013. Retrieved from <http://bafuture.org/sites/default/files/key-topics/attachments/Importance-of-water-synthesis-report.pdf>.
28. U.S. EPA. Site Information for Lexington County Landfill Area. January 25, 2016. Retrieved from [http://cumulis.epa.gov/supercpad/cursites/dsp\\_ssppSiteData1.cfm?id=0403362#Why](http://cumulis.epa.gov/supercpad/cursites/dsp_ssppSiteData1.cfm?id=0403362#Why).
29. Ariana Brocius. Reusing Contaminated Lands in Nebraska. NET News. December 19, 2013. Retrieved from <http://netnebraska.org/article/news/reusing-contaminated-lands-nebraska>.
30. Millennium Ecosystem Assessment. Ecosystems and Human Well-being: Synthesis. Washington, DC: Island Press. 2005. Retrieved from <http://www.unep.org/maweb/documents/document.356.aspx.pdf>.
31. Douglas J. Krieger, Ph.D. Economic Value of Forest Ecosystem Services: A Review. The Wilderness Society. March 2001. Retrieved from <http://www.sierraforestlegacy.org/Resources/Conservation/FireForestEcology/ForestEconomics/EcosystemServices.pdf>.
32. U.S. EPA. Bunker Hill Mining and Metallurgical Complex, Idaho, Superfund Case Study: Revitalization of the Bunker Hill Hillides and Wetlands. EPA 542-F-15-001. January 2015. Retrieved from [https://clu-in.org/ecotools/downloads/bunker\\_hill\\_eco\\_case\\_study\\_final\\_feb2015.pdf](https://clu-in.org/ecotools/downloads/bunker_hill_eco_case_study_final_feb2015.pdf).
33. John M. Kimble et al. Soil Carbon Management: Economic, Environmental and Societal Benefits. CRC Press. May 21, 2007. Retrieved from [https://books.google.com/books?id=mpu\\_OsIQLlgC&pg=PA84&lpg=PA84&dq=annual+damages+from+erosion&source=bl&ots=Y7T5WjybSO&sig=Z\\_n2m0cWXIjYGY1hqQDnDp\\_IPNc&hl=en&sa=X&ved=0CCAQ6AEwAGovChMI15S0ieWayQIVxelMCh0VLgtN#v=onepage&q=annual%20damages%20from%20erosion&f=false](https://books.google.com/books?id=mpu_OsIQLlgC&pg=PA84&lpg=PA84&dq=annual+damages+from+erosion&source=bl&ots=Y7T5WjybSO&sig=Z_n2m0cWXIjYGY1hqQDnDp_IPNc&hl=en&sa=X&ved=0CCAQ6AEwAGovChMI15S0ieWayQIVxelMCh0VLgtN#v=onepage&q=annual%20damages%20from%20erosion&f=false).
34. Douglas J. Krieger, Ph.D. Economic Value of Forest Ecosystem Services: A Review. The Wilderness Society. March 2001. Retrieved from

<http://www.sierraforestlegacy.org/Resources/Conservation/FireForestEcology/ForestEconomics/EcosystemServices.pdf>.

35. U.S. EPA. Site Information for C & D Recycling. January 25, 2016. Retrieved from [http://cumulis.epa.gov/supercpad/cursites/dsp\\_ssppSiteData2.cfm?id=0300881](http://cumulis.epa.gov/supercpad/cursites/dsp_ssppSiteData2.cfm?id=0300881).
36. U.S. EPA. Ecological Revitalization Project Profiles Database: Jamaica Island Landfill – Operable Unit 3 (OU 3). August 29, 2011. Retrieved from [https://clu-in.org/products/ecorev/er\\_details.cfm?Project\\_ID=64](https://clu-in.org/products/ecorev/er_details.cfm?Project_ID=64).
37. U.S. EPA. EPA Superfund Program: Palmerton Zinc Pile, Palmerton, PA. January 25, 2016. Retrieved from <http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300624&msspp=med>.
38. U.S. EPA. Site Information for Palmerton Zinc Pile. January 25, 2016. Retrieved from [http://cumulis.epa.gov/supercpad/cursites/dsp\\_ssppSiteData2.cfm?id=0300624#Redev](http://cumulis.epa.gov/supercpad/cursites/dsp_ssppSiteData2.cfm?id=0300624#Redev).
39. The White House, Office of the Press Secretary. Fact Sheet: The Economic Challenge Posed by Declining Pollinator Populations. June 20, 2014. Retrieved from <https://www.whitehouse.gov/the-press-office/2014/06/20/fact-sheet-economic-challenge-posed-declining-pollinator-populations>.
40. U.S. EPA. Site Information for Chemical Commodities, Inc. January 25, 2016. Retrieved from [http://cumulis.epa.gov/supercpad/cursites/dsp\\_ssppSiteData2.cfm?id=0700513#Redev](http://cumulis.epa.gov/supercpad/cursites/dsp_ssppSiteData2.cfm?id=0700513#Redev).
41. U.S. EPA. Site Information for Landia Chemical Company. January 25, 2016. Retrieved from [http://cumulis.epa.gov/supercpad/Cursites/dsp\\_ssppSiteData2.cfm?id=0400627#Redev](http://cumulis.epa.gov/supercpad/Cursites/dsp_ssppSiteData2.cfm?id=0400627#Redev).
42. Jay E. Diffendorfer et al. National Valuation of Monarch Butterflies Indicates an Untapped Potential for Incentive-Based Conservation. *Conservation Letters*. Wiley Periodicals, Inc. Volume 7, Issue 3, pages 253–262, May/June 2014. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/conl.12065/abstract>.
43. Millennium Ecosystem Assessment. *Ecosystems and Human Well-being: Synthesis*. Washington, DC: Island Press. 2005. Retrieved from <http://www.unep.org/maweb/documents/document.356.aspx.pdf>.
44. Robert Snyder et al. Culture Loss and Sense of Place in Resource Valuation: Economics, Anthropology and Indigenous Culture. *Indigenous Peoples: Resource Management and Global Rights*. 2005. Retrieved from [http://www.fs.fed.us/rm/value/docs/culture\\_sense\\_place\\_resource\\_valuation.pdf](http://www.fs.fed.us/rm/value/docs/culture_sense_place_resource_valuation.pdf).
45. Wiyot Tribe Natural Resources Department. Wiyot Tribe’s Natural Resources Department (NRD) FY14 Newsletter Articles - The Ongoing Cleanup of Humboldt Bay. 2014. Retrieved from: <http://www.wiyot.us/sites/default/files/u6/FY14%20Newsletter%20Articles%20%28Wiyot%29.pdf>.
46. Bill Donahue. More than 150 years after brutal slaughter, a small tribe returns home. *Al Jazeera America*. December 25, 2013. Retrieved from: <http://america.aljazeera.com/articles/2013/12/25/more-than-150-yearsafterbrutalslaughterasmalltribereturnshome.html>.
47. U.S. EPA. Tribal Leadership, Historic Preservation and Green Remediation: The Catholic 40 Cleanup Project in Northeast Oklahoma. October 2015. Retrieved from <http://semspub.epa.gov/src/document/06/500017890>.
48. Greg Policky, Aquatic Biologist, Colorado Parks and Wildlife. June 2014 interview.
49. Outdoor Industry Association. *The Outdoor Recreation Economy*. 2012. Retrieved from [https://outdoorindustry.org/pdf/OIA\\_OutdoorRecEconomyReport2012.pdf](https://outdoorindustry.org/pdf/OIA_OutdoorRecEconomyReport2012.pdf).
50. Ibid.
51. U.S. Fish & Wildlife Service. 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. FHW/11-NAT (RV). Revised February 2014. Retrieved from <https://www.census.gov/prod/2012pubs/fhw11-nat.pdf>.
52. David Chanatry. America's 'Most Polluted' Lake Finally Comes Clean. *National Public Radio*. July 31, 2012. Retrieved from <http://www.npr.org/2012/07/31/157413747/americas-most-polluted-lake-finally-comes-clean>.



53. U.S. EPA. Site Information for Wheeling Disposal Service Co., Inc. January 25, 2016. Retrieved from [http://cumulis.epa.gov/supercpad/cursites/dsp\\_ssppSiteData2.cfm?id=0700780#Redev](http://cumulis.epa.gov/supercpad/cursites/dsp_ssppSiteData2.cfm?id=0700780#Redev).
54. U.S. Fish & Wildlife Service. Birding in the United States: A Demographic and Economic Analysis. Report 2011-1. December 2013. Retrieved from <http://www.fws.gov/southeast/economicImpact/pdf/2011-BirdingReport--FINAL.pdf>.
55. U.S. EPA. EPA Superfund Program: Rocky Mountain Arsenal (USARMY), Adams County, CO. January 25, 2016. Retrieved from <http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800357&msspp=med>.
56. Colorado Department of Public Health & Environment. Rocky Mountain Arsenal. 2015. Retrieved from <https://www.colorado.gov/pacific/cdphe/rocky-mountain-arsenal>.
57. U.S. Fish & Wildlife Service. Rocky Mountain Arsenal National Wildlife Refuge: Visitor Activities. August 12, 2015. Retrieved from [http://www.fws.gov/refuge/Rocky\\_Mountain\\_Arsenal/visit/visitor\\_activities.html](http://www.fws.gov/refuge/Rocky_Mountain_Arsenal/visit/visitor_activities.html).
58. U.S. Army. Fort Ord Cleanup: The Environmental Cleanup of the Former Fort Ord. 2016. Retrieved from <http://fortordcleanup.com>.
59. U.S. Department of Interior, Bureau of Land Management. Fort Ord National Monument: Recreation Opportunities. June 19, 2015. Retrieved from [http://www.blm.gov/ca/st/en/prog/nlcs/Fort\\_Ord\\_NM/recreation.html](http://www.blm.gov/ca/st/en/prog/nlcs/Fort_Ord_NM/recreation.html).
60. U.S. EPA. Site Information for Times Beach. January 25, 2016. Retrieved from [http://cumulis.epa.gov/supercpad/cursites/dsp\\_ssppSiteData2.cfm?id=0701237#Redev](http://cumulis.epa.gov/supercpad/cursites/dsp_ssppSiteData2.cfm?id=0701237#Redev).
61. Missouri State Parks. Route 66 State Park. Retrieved from <https://mostateparks.com/park/route-66-state-park>.
62. National Education Association. K-12 Education in the U.S. Economy: Its Impact on Economic Development, Earnings, and Housing Values. NEA Research Working Paper. April 2004. Retrieved from <http://www.nea.org/assets/docs/HE/economy.pdf>.
63. National Wildlife Federation. Back to School: Back Outside! How Outdoor Education and Outdoor School Time Create High Performance Students. September 2010. Retrieved from <https://www.nwf.org/pdf/Be%20Out%20There/Back%20to%20School%20full%20report.pdf>.
64. National Education Association. K-12 Education in The U.S. Economy: Its Impact on Economic Development, Earnings, and Housing Values. NEA Research Working Paper. April 2004. Retrieved from <http://www.nea.org/assets/docs/HE/economy.pdf>.
65. U.S. EPA. EPA Superfund Program: Sangamo Electric Dump/Crab Orchard National Wildlife Refuge (USDO), Carterville, IL. January 25, 2016. Retrieved from <http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0501181&msspp=med>.
66. U.S. Fish & Wildlife Service. Crab Orchard National Wildlife Refuge: Visitor Activities. April 11, 2014. Retrieved from [http://www.fws.gov/refuge/Crab\\_Orchard/visit/visitor\\_activities.html](http://www.fws.gov/refuge/Crab_Orchard/visit/visitor_activities.html).
67. U.S. EPA. Celebrating Success: DuPage County Blackwell Forest Preserve. March 2013. Retrieved from <http://semspub.epa.gov/src/document/05/633178>.
68. U.S. EPA. Site Information for Southside Sanitary Landfill. January 25, 2016. Retrieved from [http://cumulis.epa.gov/supercpad/cursites/dsp\\_ssppSiteData2.cfm?id=0501655#Redev](http://cumulis.epa.gov/supercpad/cursites/dsp_ssppSiteData2.cfm?id=0501655#Redev).
69. U.S. EPA. Economic Benefits of Wetlands. EPA 843-F-06-004. May 2006. Retrieved from <http://www.beaversww.org/assets/PDFs/EconomicBenefitsofWetlands.pdf>.
70. Robert Costanza et al. The Value of New Jersey's Ecosystem Services and Natural Capital. July 2006. Retrieved from <http://www.state.nj.us/dep/dsr/naturalcap/nat-cap-2.pdf>.

- 
71. U.S. EPA. Wetland Functions and Values. Watershed Academy Web. Retrieved from <http://cfpub.epa.gov/watertrain/pdf/modules/wetlandsfunctions.pdf>.
  72. Ibid.
  73. U.S. EPA. Ecological Revitalization Project Profiles Database: Nahant Marsh Superfund Site. January 8, 2013. Retrieved from [https://clu-in.org/products/ecorev/er\\_details.cfm?Project\\_ID=141](https://clu-in.org/products/ecorev/er_details.cfm?Project_ID=141).
  74. Nahant Marsh Education Center. About Us. 2016. Retrieved from <http://nahantmarsh.org/about-us>.
  75. Adapted from U.S. EPA. FEGS Classification Matrix 12: Wetlands. From Final Ecosystem Goods and Services Classification System (FEGS-CS). EPA-600-R-13-ORD-004914. Retrieved from [http://cfpub.epa.gov/si/si\\_public\\_record\\_report.cfm?dirEntryId=257922](http://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=257922).

## Appendix A: Links to More Information on Highlighted Sites

Site	Location	Site Profile Page
Black Butte Mine	Cottage Grove, OR	<a href="https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1001865">https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1001865</a>
Bunker Hill Mining and Metallurgical Complex	Smelterville, ID	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000195">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000195</a>
California Gulch	Leadville, CO	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0801478">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0801478</a>
Indian Island	Eureka, CA	<a href="https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0909548">https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0909548</a>
Palmerton Zinc Pile	Palmerton, PA	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300624">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300624</a>
Phoenix-Goodyear Airport Area	Goodyear, AZ	<a href="https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0900672">https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0900672</a>
Rocky Mountain Arsenal	Adams County, CO	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800357">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800357</a>
Sangamo Electric Dump/Crab Orchard National Wildlife Refuge	Carterville, IL	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0501181">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0501181</a>

## Appendix B: Superfund Sites with Ecological Reuse and Continued Use

The table below includes 163 Superfund sites that are in reuse or continued use and support ecological land use. A search of EPA's Superfund Redevelopment (SURE) Information Library in January 2016 identified these sites.

For additional information on sites in ecological reuse, visit [https://clu-in.org/products/ecorev/er\\_search.cfm](https://clu-in.org/products/ecorev/er_search.cfm).

Site	Site Profile Page	Location	Wetland	Environmental Education
Alabama Army Ammunition Plant	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400449">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400449</a>	Childersburg, AL		
Allied Chemical & Ironton Coke	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0504336">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0504336</a>	Ironton, OH	Yes	
Annapolis Lead Mine	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0702917">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0702917</a>	Annapolis, MO		
Apache Powder Co.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0900510">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0900510</a>	Benson, AZ	Yes	
Applied Environmental Services	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0202121">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0202121</a>	Glenwood Landing, NY		
Army Creek Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300086">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300086</a>	New Castle, DE	Yes	
Asbestos Dump	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200769">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200769</a>	Millington, NJ		
Atlantic Wood Industries, Inc.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302836">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302836</a>	Portsmouth, VA	Yes	
Atlas Tack Corp.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100376">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100376</a>	Fairhaven, MA	Yes	
Avtex Fibers, Inc.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302606">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302606</a>	Front Royal, VA		
Bailey Waste Disposal	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0602911">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0602911</a>	Bridge City, TX	Yes	
Bayou Bonfouca	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0600574">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0600574</a>	Slidell, LA		
Beltsville Agricultural Research Center (USDA)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300415">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300415</a>	Beltsville, MD	Yes	
Berks Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300473">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300473</a>	Spring Township,, PA		
Bowers Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0504541">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0504541</a>	Circleville, OH	Yes	
Brodhead Creek	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301433">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301433</a>	Stroudsburg, PA		
Bunker Hill Mining & Metallurgical Complex	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000195">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000195</a>	Smeltonville, ID	Yes	
Butz Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301833">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301833</a>	Stroudsburg, PA	Yes	

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C & D Recycling	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300881">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300881</a>	Foster Township, PA		
California Gulch	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0801478">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0801478</a>	Leadville, CO		
Chemical Commodities, Inc.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0700513">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0700513</a>	Olathe, KS		Yes
Chemical Leaman Tank Lines, Inc.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200327">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200327</a>	Bridgeport, NJ		
Chemsol, Inc.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200607">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200607</a>	Piscataway, NJ	Yes	
Cherokee County	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0700667">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0700667</a>	Galena, KS		
Chisman Creek	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302756">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302756</a>	York County, VA		
Coalinga Asbestos Mine	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902075">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902075</a>	Coalinga, CA		
Commencement Bay, Near Shore/Tide Flats	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000981">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000981</a>	Pierce County, WA		
Craig Farm Drum	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301212">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301212</a>	Parker, PA	Yes	
Curtis Specialty Papers, Inc	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203733">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203733</a>	Milford, NJ		
Davenport And Flagstaff Smelters	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0801257">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0801257</a>	Sandy, UT		
Davisville Naval Construction Battalion Center	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101430">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101430</a>	North Kingstown, RI		
De Rewal Chemical Co.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200792">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200792</a>	Kingwood Township, NJ		
Dorney Road Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301228">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301228</a>	Upper Macungie Township, PA	Yes	
E.I. Du Pont De Nemours & Co., Inc. (Newport Pigment Plant Landfill)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300093">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300093</a>	Newport, DE	Yes	
East Bethel Demolition Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503926">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503926</a>	East Bethel Township, MN		
Eastern Diversified Metals	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301588">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301588</a>	Hometown, PA		
El Toro Marine Corps Air Station	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902770">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902770</a>	El Toro, CA		
Elizabeth Mine	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0102071">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0102071</a>	Strafford, VT		
Ely Copper Mine	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0102065">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0102065</a>	Vershire, VT		



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Federal Aviation Administration Technical Center (USDOT)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0201178">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0201178</a>	Atlantic County, NJ		
Feed Materials Production Center (USDOE)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0504934">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0504934</a>	Fernald, OH	Yes	
Fort Devens	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100966">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100966</a>	Fort Devens, MA		
Fort Devens-Sudbury Training Annex	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100685">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100685</a>	Sudbury, MA		
Fox River NRDA/PCB Releases	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0507723">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0507723</a>	Green Bay, WI	Yes	
Ge - Housatonic River	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100460">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100460</a>	Pittsfield, MA		
General Motors (Central Foundry Division)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0201644">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0201644</a>	Massena, NY		
Gowanus Canal	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0206222">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0206222</a>	Brooklyn, NY		
H.O.D. Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0500581">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0500581</a>	Antioch, IL	Yes	
Hastings Ground Water Contamination	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0701973">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0701973</a>	Hastings, NE		
Hercules 009 Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0401699">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0401699</a>	Brunswick, GA		
Idaho National Engineering Laboratory (USDOE)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000305">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000305</a>	Idaho Falls, ID		
Ilada Energy Co.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0500942">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0500942</a>	East Cape Girardeau, IL		
Imperial Oil Co., Inc./Champion Chemicals	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200764">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200764</a>	Morganville, NJ		
Industrial Excess Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0504014">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0504014</a>	Uniontown, OH		
Industri-Plex	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100580">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100580</a>	Woburn, MA	Yes	
International Smelting and Refining	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800650">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800650</a>	Tooele, UT		
Iron Horse Park	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100524">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100524</a>	Billerica, MA	Yes	

Site	Site Profile Page	Location	Wetland	Environmental Education
Jacks Creek/Sitkin Smelting & Refining, Inc.	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0301569">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0301569</a>	Maitland, PA	Yes	
Jacobsville Neighborhood Soil Contamination	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0508142">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0508142</a>	Evansville, IN		
Joliet Army Ammunition Plant (Load-Assembly-Packing Area)	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0501170">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0501170</a>	Joliet, IL		
Joliet Army Ammunition Plant (Manufacturing Area)	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0501179">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0501179</a>	Joliet, IL		
Jones Sanitation	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0202045">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0202045</a>	Hyde Park, NY	Yes	
Kennecott (North Zone)	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0800636">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0800636</a>	Magna, UT	Yes	
Kerr-Mcgee (Sewage Treatment Plant)	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0500763">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0500763</a>	West Chicago, IL		
Landia Chemical Company	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0400627">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0400627</a>	Lakeland, FL		
Lipari Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0200557">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0200557</a>	Pitman, NJ		
Longhorn Army Ammunition Plant	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0603606">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0603606</a>	Karnack, TX	Yes	
Loring Air Force Base	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0101074">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0101074</a>	Limestone, ME		
Lower Darby Creek Area	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0305521">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0305521</a>	Darby Twp, PA		
Lower Duwamish Waterway	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=1002020">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=1002020</a>	Seattle, WA		
Main Street Well Field	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0501813">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0501813</a>	Elkhart, IN		
Marathon Battery Corp.	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0201491">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0201491</a>	Cold Springs, NY		
Martin-Marietta, Sodyeco, Inc.	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0402588">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0402588</a>	Charlotte, NC		
Materials Technology Laboratory (USARMY)	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0100953">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0100953</a>	Watertown, MA	Yes	
Mccormick & Baxter Creosoting Co. (Portland Plant)	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=1000339">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=1000339</a>	Portland, OR		
Mcguire Air Force Base #1	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0201162">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0201162</a>	Wrightstown, NJ		

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Metal Working Shop	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503169">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503169</a>	Lake Ann, MI		
Milan Army Ammunition Plant	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0404147">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0404147</a>	Milan, TN	Yes	
Mill Creek Dump	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301185">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301185</a>	Erie, PA	Yes	
Milltown Reservoir/Clark Fork River	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800445">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800445</a>	Milltown, MT		Yes
Monticello Mill Tailings (USDOE)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800867">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800867</a>	Monticello, UT		
Naval Amphibious Base Little Creek	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302853">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302853</a>	Virginia Beach, VA	Yes	
Naval Surface Warfare Center - Dahlgren	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302862">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302862</a>	Dahlgren, VA	Yes	
New London Submarine Base	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100261">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100261</a>	New London, CT	Yes	
Newtown Creek	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0206282">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0206282</a>	Brooklyn, Queens,, NY		Yes
Norfolk Naval Shipyard	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302841">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302841</a>	Portsmouth, VA		
North Penn - Area 5	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301452">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301452</a>	Montgomery Township, PA		
Northwest 58Th Street Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400900">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400900</a>	Hialeah, FL	Yes	
Nyanza Chemical Waste Dump	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100948">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100948</a>	Ashland, MA		
Oeser Co.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000590">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000590</a>	Bellingham, WA		
Old Navy Dump/Manchester Laboratory (USEPA/NOAA)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1001134">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1001134</a>	Manchester, WA		
Old Southington Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100251">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100251</a>	Southington, CT		
Onondaga Lake	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203382">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203382</a>	Syracuse, NY		
Ordnance Works Disposal Areas	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302884">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302884</a>	Morgantown, WV	Yes	
Oronogo-Duenweg Mining Belt	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0701290">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0701290</a>	Joplin, MO	Yes	
Ottati & Goss/Kingston Steel Drum	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101210">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101210</a>	Kingston, NH	Yes	
Palmerton Zinc Pile	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300624">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300624</a>	Palmerton, PA		





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Petersen Sand & Gravel	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0500127">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0500127</a>	Libertyville, IL		
Port Hadlock Detachment (USNAVY)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1001117">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1001117</a>	Indian Island, WA		
Portsmouth Naval Shipyard	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101072">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101072</a>	Kittery, ME	Yes	
Presque Isle	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301229">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301229</a>	Erie, PA		
PSC Resources	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100747">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100747</a>	Palmer, MA	Yes	
Queen City Farms	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000835">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000835</a>	Maple Valley, WA	Yes	
Resin Disposal	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301042">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301042</a>	Jefferson Borough, PA		
Re-Solve, Inc.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100682">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100682</a>	Dartmouth, MA	Yes	
Revere Chemical Co.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300982">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300982</a>	Nockamixon Township, PA		
Ringwood Mines/Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200663">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200663</a>	Ringwood Borough, NJ		
Rocky Flats Plant (USDOE)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800360">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800360</a>	Golden, CO		
Rocky Mountain Arsenal (USARMY)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800357">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800357</a>	Adams County, CO		Yes
Ryeland Road Arsenic Site	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301755">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301755</a>	Heidelberg Twp., PA	Yes	
Saco Municipal Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101010">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101010</a>	Saco, ME	Yes	
Saltville Waste Disposal Ponds	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302526">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0302526</a>	Saltville, VA		
San Fernando Valley (Area 4)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902253">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902253</a>	Los Angeles, CA		
Sangamo Electric Dump/Crab Orchard National Wildlife Refuge (USDOI)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0501181">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0501181</a>	Carterville, IL		
Savanna Army Depot Activity	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0501174">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0501174</a>	Savanna, IL		
Savannah River Site (USDOE)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0403485">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0403485</a>	Aiken, SC		
Schuykill Metals Corp.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400710">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400710</a>	Plant City, FL	Yes	
Sharon Steel Corp (Farrell Works Disposal Area)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300530">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300530</a>	Hickory Township, PA		

Site	Site Profile Page	Location	Wetland	Environmental Education
Silver Bow Creek/Butte Area	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800416">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0800416</a>	Butte, MT	Yes	
Solitron Microwave	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400642">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400642</a>	Port Salerno, FL	Yes	
Solvents Recovery Service of New England	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100124">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100124</a>	Southington, CT		
Somersworth Sanitary Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101128">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101128</a>	Somersworth, NH	Yes	
South Bay Asbestos Area	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902250">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902250</a>	Alviso, CA	Yes	
South Dayton Dump & Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0504661">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0504661</a>	Moraine, OH		
South Municipal Water Supply Well	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101146">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101146</a>	Peterborough, NH	Yes	
Southern Maryland Wood Treating	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300305">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300305</a>	Hollywood, MD		
St. Louis River Site	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503761">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503761</a>	Duluth, MN	Yes	
Stauffer Chemical Co (Tampa)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400537">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400537</a>	Tampa, FL		
Strasburg Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300449">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300449</a>	Newlin Township, PA		
Sullivan'S Ledge	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100744">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100744</a>	New Bedford, MA	Yes	
Summitville Mine	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0801194">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0801194</a>	Rio Grande County, CO	Yes	
Tex-Tin Corp.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0602105">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0602105</a>	Texas City, TX		
Torch Lake	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503034">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0503034</a>	Houghton County, MI		Yes
Town Garage/Radio Beacon	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101162">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0101162</a>	Londonderry, NH	Yes	
Triana/Tennessee River	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0405546">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0405546</a>	Usamicom Drsmi Kl Limestone/Morgan, AL		
Tybouts Corner Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300035">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0300035</a>	New Castle, DE		
Usarmy/Nasa Redstone Arsenal	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0405545">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0405545</a>	Huntsville, AL		
Vineland Chemical Co., Inc.	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200209">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200209</a>	Vineland, NJ		
Walsh Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301570">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0301570</a>	Honeybrook Township, PA		
Weldon Spring Quarry/Plant/Pits (USDOE/Army)	<a href="http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0701753">http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0701753</a>	St. Charles County, MO		



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Wells G&H	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0100749">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0100749</a>	Woburn, MA		
West Kingston Town Dump/Uri Disposal Area	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0101322">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0101322</a>	South Kingstown, RI		
Wheeling Disposal Service Co., Inc., Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0700780">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0700780</a>	Amazonia, MO		
Whitewood Creek	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0800570">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0800570</a>	Whitewood, SD		
Wildcat Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0300101">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0300101</a>	Dover, DE		
Woodlawn County Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0300265">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0300265</a>	Colora, MD		
Woodstock Municipal Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0500585">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0500585</a>	Woodstock, IL		
Wyckoff Co./Eagle Harbor	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=1000612">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=1000612</a>	Bainbridge Island, WA		
York County Solid Waste and Refuse Authority Landfill	<a href="http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0301590">http://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0301590</a>	Stewartstown, PA		