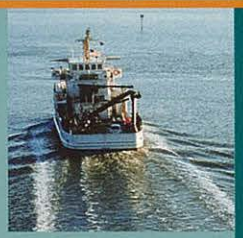
Damage Assessment and Restoration Program

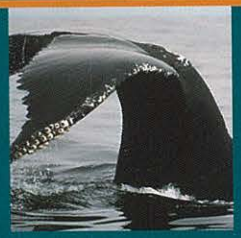
National Oceanic and Atmospheric Administration
www.darp.noaa.gov
2002

REVERSING THE TIDE

Restoring our nation's coastal environment



For more than a decade, NOAA's Damage Assessment and Restoration Program has been restoring coastal resources injured by oil spills and hazardous substances.



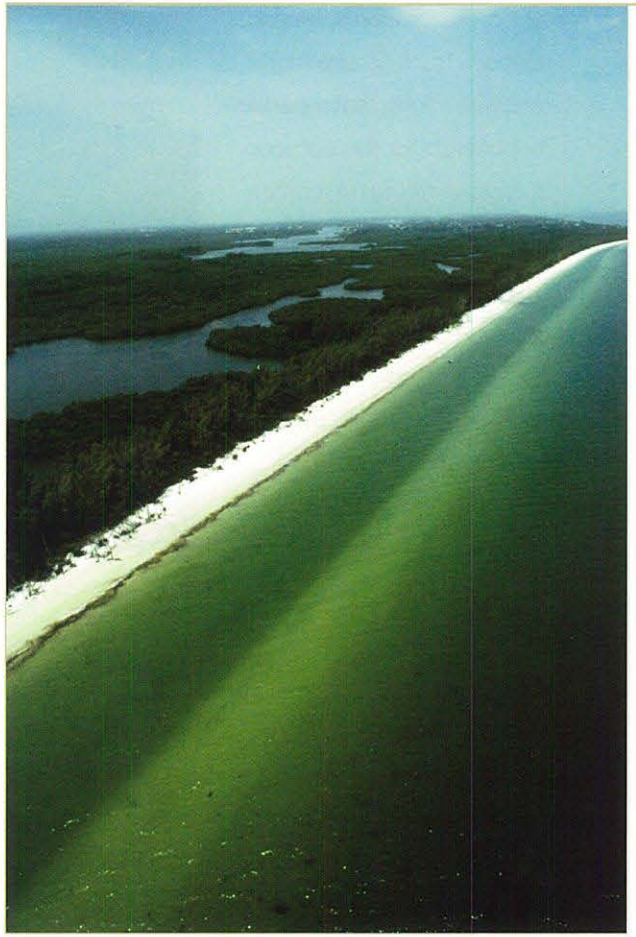
Contents

Acronyms

CAPP	Cooperative Assessment Pilot Project
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CWA	Clean Water Act
DARP	Damage Assessment and Restoration Program
DDT	dichloro-diphenyl-trichloroethane
EC	European Commission
HEA	habitat equivalency analysis
MOU	Memorandum of Understanding
NMSA	National Marine Sanctuary Act
NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resource Damage Assessment
OPA	Oil Pollution Act of 1990
PCBs	polychlorinated biphenyls

Threats to Our Nation's Coasts

Public lands, waters, and natural resources are held in trust for the benefit of all people and future generations.



Every year, U.S. waters are contaminated by millions of gallons of oil and chemicals from ships, pipelines, and hazardous waste sites. More than 700 hazardous waste sites threaten the nation's coastline. Mining activity contaminates rivers and streams and destroys critical fish habitat. Not only do these pollutants harm our coasts and waterways, they also affect our economic well-being.

The National Oceanic and Atmospheric Administration (NOAA) acts on behalf of the public as a trustee to manage, protect, and restore coastal and marine resources. The Damage Assessment and Restoration Program (DARP) fulfills one of NOAA's trustee responsibilities by assessing and restoring resources injured by oil spills and hazardous substance releases.

Natural trust resources

According to the public trust doctrine—a principle of property law—public lands, waters, and living resources are held in trust for the benefit of all people and future generations. The same principle establishes the public's right to enjoy the many uses these resources provide. Since the 1970s, the U.S. Congress has enacted a number of federal statutes to protect and manage the natural resources that belong to all Americans. Congress directed the President to designate natural resource trustees to protect and restore these trust resources when they are threatened or harmed by releases of oil and hazardous substances.

>>>> **More than 30,000 oil and chemical spills occur in water and on land throughout the United States each year.**

>>>> **There are currently more than 2,500 advisories warning citizens about the hazards of consuming contaminated fish from specific U.S. coastal and marine waters.**

>>>> **Marshes and tidal flats are particularly at risk; they can harbor oil for decades after a spill.**

Sources: NOAA, the U.S. Environmental Protection Agency, and the Academy of Natural Sciences

NOAA's trust resources include:

- Commercial and recreational fisheries.
- Fish, such as salmon that spawn in fresh water and migrate to the sea.
- Endangered and threatened marine species.
- Marine mammals.
- Wetlands, mangroves, seagrass beds, coral reefs, and other coastal habitats.
- All natural resources associated with National Marine Sanctuaries and National Estuarine Research Reserves.

Authority to conduct NRDA

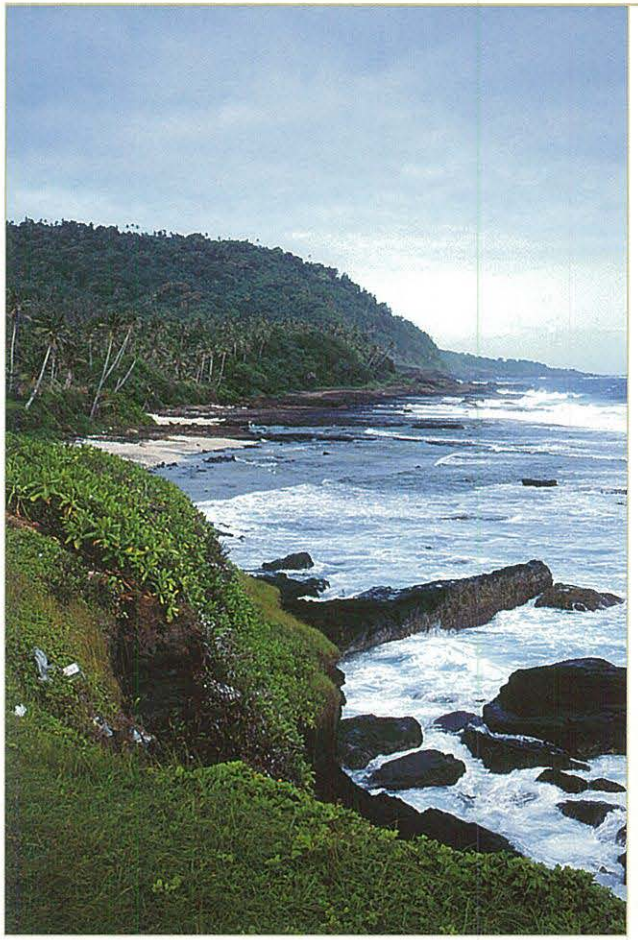
The following laws and associated regulations establish authority for NOAA and other federal, state, and tribal governments to serve as trustees on the public's behalf and conduct a natural resource damage assessment (NRDA) after an oil spill or hazardous substance release. Trustees use funds recovered from those parties responsible for the pollution to restore natural resources.

CERCLA. The 1980 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and subsequent amendments (Superfund Amendments and Reauthorization Act) direct trustees to assess and restore resources injured by hazardous substances.

OPA. In the wake of the 1989 Exxon *Valdez* oil spill in Alaska, the Oil Pollution Act (OPA) was passed to help prevent future oil spills, ensure cleanup when they happen, and assess and restore natural resources injured by these incidents. OPA requires NOAA to develop and maintain NRDA regulations in addition to assessing damages.

NMSA. The National Marine Sanctuary Act of 1972 provides authority for NOAA to assess, restore, and monitor sanctuary resources injured by oil spills, hazardous substance releases, or physical impacts.

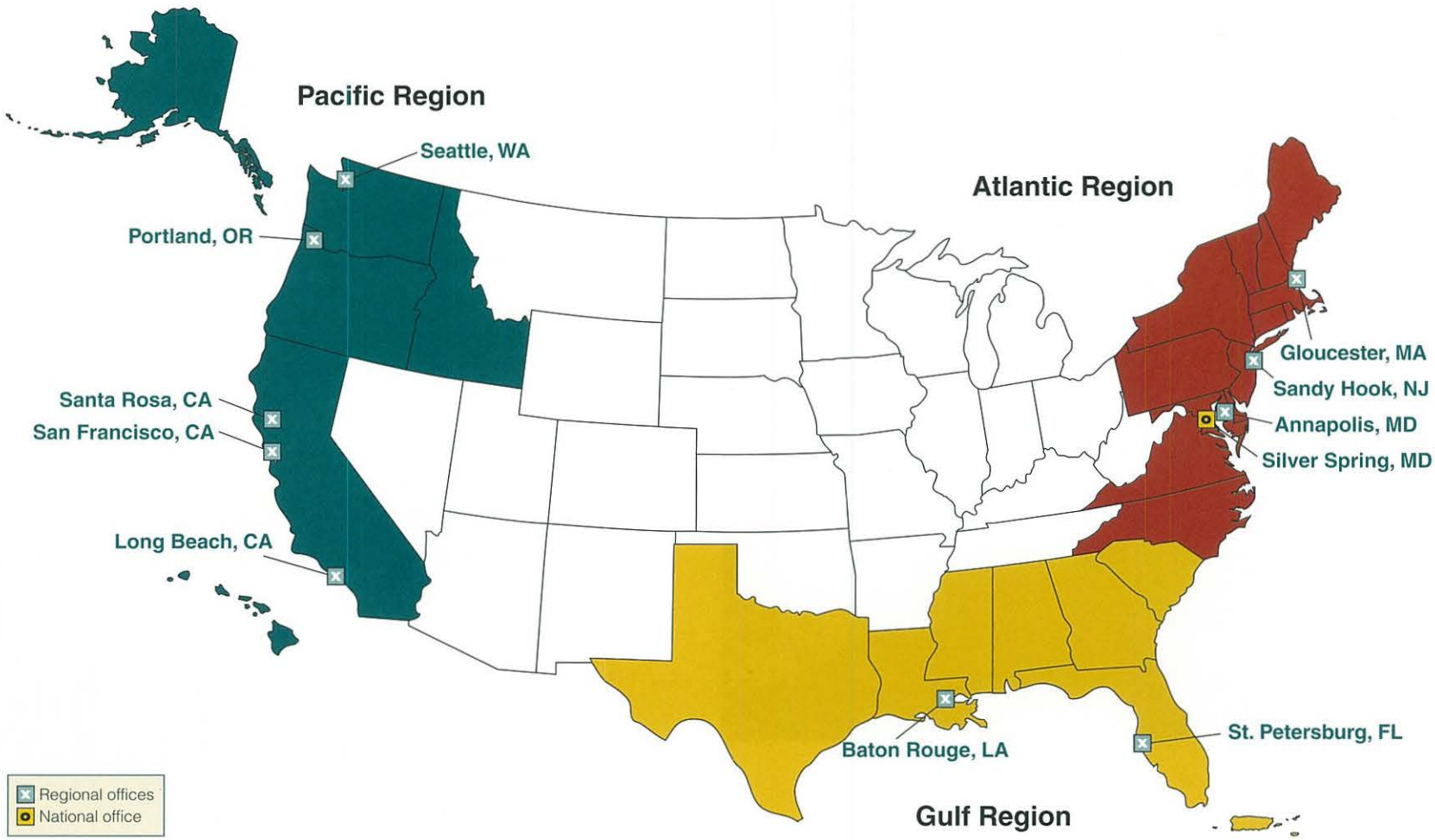
The Damage Assessment and Restoration Program



Good laws are only part of the formula to protect and restore natural resources. Trustee agencies with expertise and ability to follow through are also vital. Since its establishment in 1970, NOAA has been responsible for observing, conserving, and managing coastal and marine resources. Following the Exxon *Valdez* oil spill, NOAA created DARP to determine injury, assess natural resource damages, and conduct restoration after pollution releases.

DARP, a multioffice program within NOAA, involves the agency's National Ocean Service, the National Marine Fisheries Service, and the Office of General Counsel. Scientists, economists, and attorneys from these three offices work together to assess and restore resources injured after an oil spill or hazardous substance release. DARP experts in offices across the country address threats to U.S. coastal waters. Since 1990, DARP, working with co-trustee partners, has generated $300 million from parties responsible for pollution to restore the nation's coastal and marine resources.

DARP staff are located in coastal regions to carry out day-to-day damage assessment and restoration activities



DARP experts

During the past decade, DARP scientists, economists, and attorneys have provided hands-on experience, leadership, and expertise to quickly restore wetlands, estuaries, fisheries, and wildlife. DARP has worked on natural resource damage assessments across the country—including contaminated mining sites in California and Idaho, Superfund sites in Massachusetts and New York, and oil spills in Alaska, Florida, Hawaii, Louisiana, Oregon, and Washington.

DARP experts are located in key coastal regions to ensure a quick response when spills occur. DARP's Rapid Assessment Program enables NOAA to arrive on the scene immediately following an incident to take samples of oiled resources or collect other information such as aerial photographs. By collecting data during the first hours and days following an incident, DARP documents the injuries for later use in restoration planning, in negotiated settlements, and, if necessary, in litigation.

At coastal waste sites, DARP scientists and economists conduct ecological and economic studies to determine the impacts on natural resources from hazardous substances like PCBs and heavy metals, estimate economic values, and develop restoration plans. For example, DARP economists are working with the New York State Department of Environmental Conservation and the U.S. Fish and Wildlife Service to study the potential injuries to fishing from long-term PCB pollution in the Hudson River. DARP and co-trustees are also implementing studies to identify PCB impacts on floodplains, birds, and other wildlife.

Whether it is an oil spill or a hazardous waste site, DARP's goal remains constant: Restore the resources that were injured.

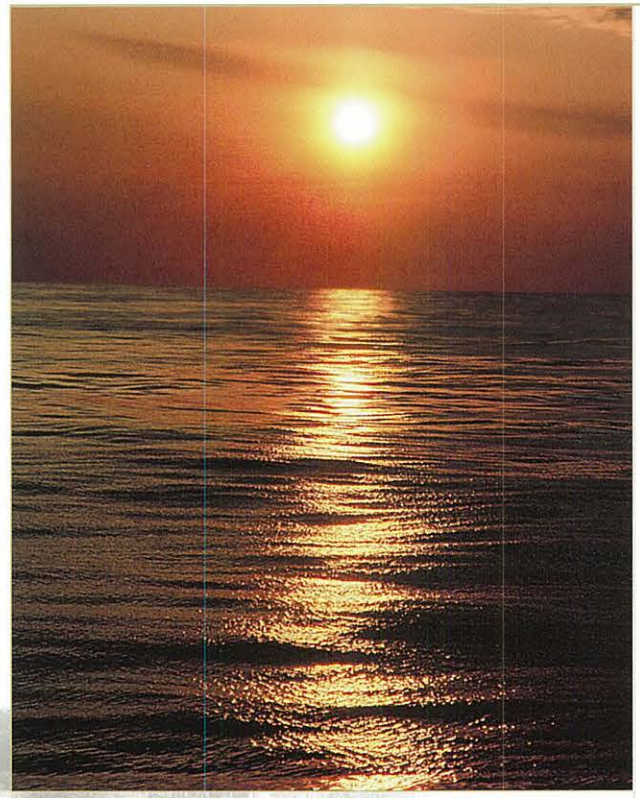
OIL COATS RHODE ISLAND WATERS AND BEACHES

In January 1996, the barge *North Cape* and the tug *Scandia* grounded off Rhode Island, resulting in the state's largest oil spill: 828,000 gallons of home heating oil. Gale-force winds drove the toxic heating oil through 60 feet of water, killing millions of bottom-dwelling organisms. The oil spread throughout a large area of Block Island Sound, causing the closure of a 250-square-mile area to fishing and shutting down the lobster industry for 5 months.

Working with its co-trustees from the Rhode Island Department of Environmental Management and the U.S. Fish and Wildlife Service, NOAA conducted a natural resource damage assessment. The trustees found that the spill killed 9 million lobsters, 19 million surf clams, more than 4 million fish, 2,300 marine birds, and millions of worms, crabs, shrimps, oysters, and mussels. To restore resources and services injured by the oil, trustees are conducting the following projects:

- Purchase, tag, and release more than 1 million adult female lobsters into Block Island Sound over a 5-year period.
- Plant 118 million oyster seeds over an 8-year period.
- Implement a 5-year project to minimize predation and human disturbance of piping plovers.
- Reconstruct a public stairway and walkway down a bluff to improve shoreline access.
- Purchase and protect critical habitat for loons and eiders threatened by development.
- Restore anadromous fish runs on two rivers to increase populations of river herring and address injuries to recreational fishing.

Natural Resource Damage Assessment



The type of oil or hazardous substance, the amount released, the season when the incident occurs—all of these factors affect how fast restoration and recovery occur.

How NRDA works

More than 150,000 gallons of oil spill from a pipeline into a tributary of Maryland's Chesapeake Bay. DDTs and PCBs released into the Pacific Ocean near Los Angeles cause fish consumption advisories for decades. An Idaho mining operation contaminates 25 miles of surface waters and sediments, severely impacting salmon and other fish.

After such incidents, response agencies like the U.S. Environmental Protection Agency or the U.S. Coast Guard clean up the release to eliminate or reduce risks to public health. These efforts may not fully restore injured natural resources or address their lost use to the public. Through the NRDA process, DARP experts conduct studies to identify the extent of natural resource injuries, the best methods for restoring those resources, and the type and amount of restoration required.

Although the concept of assessing injuries may sound simple, understanding complex ecosystems, the services these ecosystems provide, and the injuries caused by oil and hazardous substances takes time—often years. The season the resource was injured, the type of oil or hazardous substance, and the amount and duration of the release are among the factors that affect how quickly restoration and recovery occur. The rigorous scientific studies that are necessary to prove injury to resources and services—and withstand scrutiny in a court of law—may also take years to implement and complete.

NOAA's ultimate goal is to restore the resources injured by the incident. NOAA and co-trustees implement two kinds of restoration projects:

- *Primary restoration* returns the injured resources to the condition that would have existed if the incident had not occurred. Trustees often take actions that speed recovery of the injured resource, such as reconstructing physical habitat that was destroyed, but sometimes natural recovery is the best approach.
- *Compensatory restoration* addresses losses from the date of injury until recovery is completed. While the resource is impaired, it is unable to provide services on which other parts of the ecosystem and the public rely (such as fish nursery habitat). Compensatory restoration may be needed even if natural recovery is the best approach for primary restoration.

Injured resources and services

Oil and hazardous substance releases can harm natural resources in a number of ways. The most immediate and visible impacts may be oiled beaches and dead organisms—such as fish, lobsters, birds, wetland plants, and seagrasses.

Other impacts may not be readily apparent. For example, nurseries for fish or nesting sites for birds and turtles may be destroyed, and birds and other wildlife may become ill from eating contaminated food. Some impacts may not show up for weeks, months, or even years and are challenging to assess. Wetlands may slowly be destroyed several months after an incident, coral reefs may continue to erode and become more susceptible to disease, and birds may be unable to reproduce.

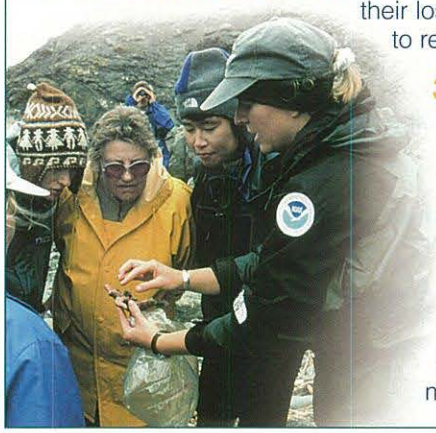
After an oil spill or hazardous substance release, NOAA conducts the following steps to identify injuries and restore resources:

1 >>>> Preliminary Assessment

Natural resource trustees determine whether injury to public trust resources has occurred. Their work includes collecting time-sensitive data and reviewing scientific literature about the released substance and its impact on trust resources to determine the extent and severity of injury. If resources are injured, trustees proceed to the next step.

2 >>>> Injury Assessment/Restoration Planning

Trustees quantify injuries and identify possible restoration projects. Economic and scientific studies assess the injuries to natural resources and the loss of services. These studies are also used to develop a restoration plan that outlines alternative approaches to speed the recovery of injured resources and compensate for their loss or impairment from the time of injury to recovery.

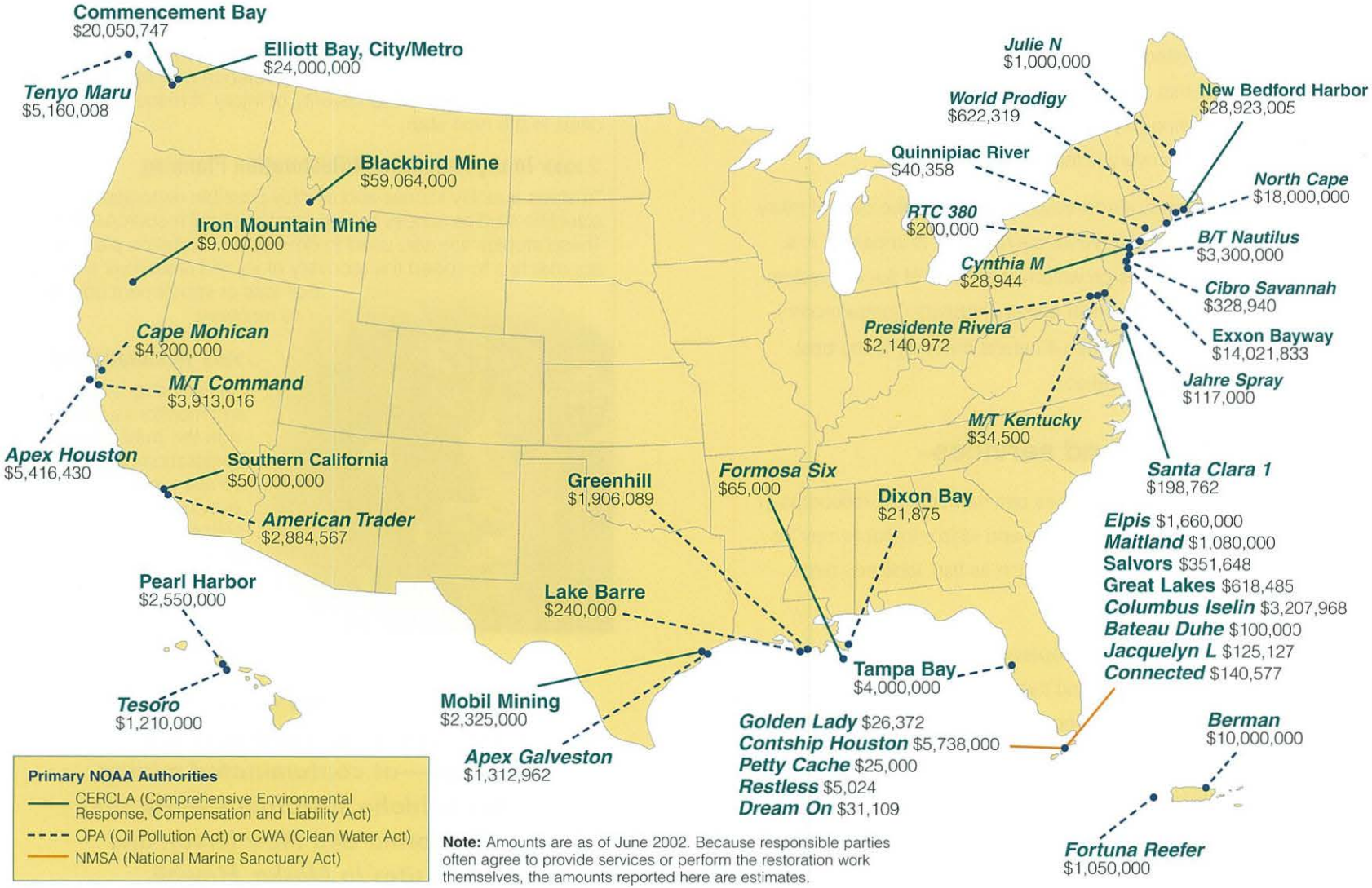


3 >>>> Restoration Implementation

The final step is to implement restoration and monitor its effectiveness. Trustees work with the public to select and implement restoration projects. Examples of restoration include replanting wetlands, improving fishing access sites, and restoring salmon streams. The responsible party pays the costs of assessment and restoration and is often a key participant in implementing the restoration.

DARP has assessed and restored numerous resources across the country—at contaminated mining sites in Idaho, hazardous waste sites in California and New Jersey, and oil spill sites in Alaska, Hawaii, Texas, and Washington.

$300 Million Generated To Restore Coastal Resources



Note: Amounts are as of June 2002. Because responsible parties often agree to provide services or perform the restoration work themselves, the amounts reported here are estimates.

A spill or release may also diminish the services that natural resources provide, which include human services (e.g., fishing, boating, beach-going, and wildlife viewing) and ecological services (e.g., providing habitat, nutrient cycling, and energy transfer through food webs).

As a trustee, NOAA first identifies the injuries to coastal and marine resources and then determines the best restoration methods. DARP experts protect the public's interests and ensure that the polluter pays for the restoration necessary to address the injuries.

Restoration results

Results from the $300 million that DARP has generated for restoration can be seen in California, Connecticut, Florida, Idaho, Louisiana, Maine, Massachusetts, New Jersey, New York, Puerto Rico, Rhode Island, Texas, and Washington.

These monies have been used to improve fish-spawning areas in wetlands, create "buffers" along streams to protect water quality, build reefs to nurture lobster populations, develop trails and natural resource education programs, and restore salmon streams.

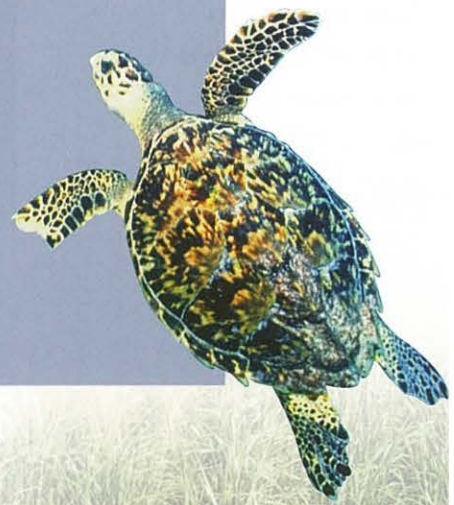
Natural resource damage assessments have also resulted in major changes in public and industry understanding of pollution incidents. Responsible parties are more aware of how their activities affect sensitive resources and the importance of preventing spills and releases. Citizens have a better understanding of how NRDA can help rebuild the environment after an oil or hazardous substance release and of how they can help identify restoration projects that would most benefit their communities.

RESTORING MANGROVES, TURTLES, AND BIRDS IN FLORIDA

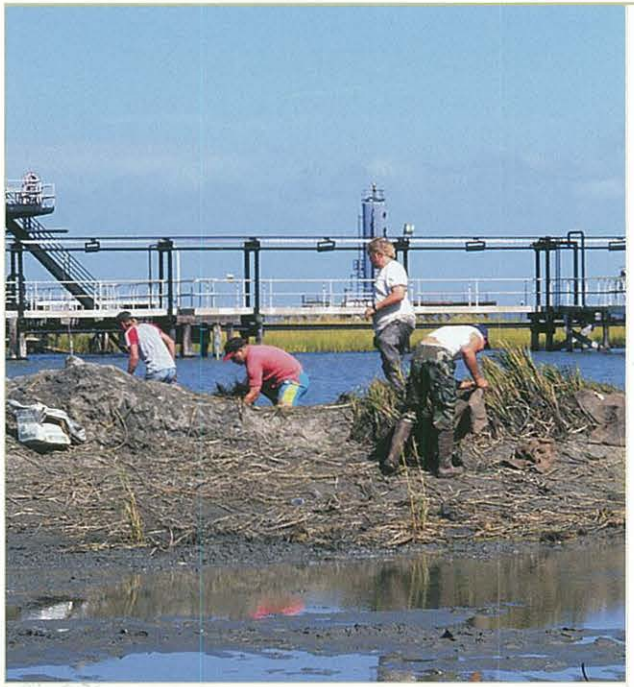
In the summer of 1993, three ships collided near the entrance to Tampa Bay, causing a fire that lasted 18 hours and spilled roughly 300,000 gallons of oil. The oil caused injury to mangroves, seagrass beds, saltmarsh habitats, birds, endangered sea turtle nesting areas, and shellfish. Citizens were unable to visit beaches, fish, boat, or swim in the area.

NOAA, other trustees, and the vessel owners agreed to a $4 million settlement for restoration of injured natural resources. Citizens were instrumental in helping identify many of the following restoration projects:

- Acquire and improve 13.5 acres of saltmarsh, mangrove, and other coastal habitat.
- Create and improve additional coastal wetlands to benefit water quality.
- Conduct sea turtle recovery and monitoring programs.
- Reduce bird mortality by removing fishing lines from mangrove trees where birds nest.
- Install signs at fishing piers explaining how to safely remove fishhooks from seabirds.
- Improve access to shorelines for recreation.



Cooperative Working Relationships



NOAA's Damage Assessment and Restoration Program works with all affected interests— the public, the responsible party, and other trustee agencies.

From the time when samples of injured resources are collected to the time when marshes are replanted or reefs are built, NOAA strives to work with *all* affected interests. The public, the party responsible for the pollution, and local, state, and federal agencies and tribes are essential partners in restoring coastal and marine resources.

Local, state, tribal, and federal trustees generally work as a team to assess injuries and conduct restoration. Citizens provide key input on the types of restoration projects that are best for their community. The responsible party is invited to participate in assessment and restoration activities. Companies such as Alcoa, ChevronTexaco, DuPont, Mobil, Pepco, and Tesoro Petroleum Corporation have worked cooperatively with NOAA in damage assessments across the country to restore resources after an oil spill or hazardous substance release.

For example, a pipe owned by Texaco Pipeline Company ruptured in Louisiana and oiled acres of critical marshland in Lake Barre. NOAA and other federal and state trustees worked with Texaco to quickly assess injuries and identify restoration projects. The trustees and Texaco cast a wide net in search of restoration projects to address injured marshland, fish, shellfish, and birds. Two years after the spill, the trustees and responsible party (now called Equilon Pipeline Company after Texaco merged with another company) had successfully cooperated to plant more than 20 acres of saltmarsh wetlands.

Good working relationships with other trustees, the responsible party, and affected citizens, combined with a proven regulatory framework and DARP's experience in conducting assessments, are critical factors for successful restoration.

Cooperative effort resolves Mississippi oil spill

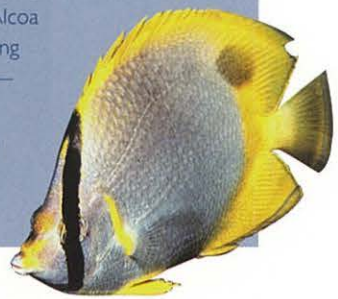
Another example of a cooperative public-private partnership occurred after the November 2000 oil spill in Louisiana. The tanker *Westchester* suffered a punctured cargo tank and released roughly 500,000 gallons of crude oil into the Mississippi River downstream from New Orleans. The spill—one of the largest in the United States since the Exxon *Valdez* spill—injured birds, fish, and critical habitat, and impacted fishing and hunting.

While response agencies contained the spill and cleaned the area, NOAA and co-trustees initiated a damage assessment. To evaluate oil impacts, trustees surveyed habitats, conducted modeling studies to estimate bird and fish losses, and evaluated impacts to recreational uses. The responsible parties and their insurers worked closely with the trustees throughout the NRDA. From developing and implementing injury study plans to identifying potential restoration projects, the responsible parties and the trustees shared information and jointly made decisions. Due to this well-coordinated NRDA, agreement on ecological and recreational restoration projects was reached within a year. The rapid resolution of an oil spill of this magnitude would have been impossible without the cooperation of all interests.

RESTORATION THAT FITS

One example of successful cooperation is the restoration of Lavaca Bay in Texas, where residents from Calhoun, Jackson, and Victoria Counties were instrumental in identifying restoration projects that best fit their communities. Since the late 1940s, Alcoa has operated a manufacturing facility that has released hazardous substances into the bay. Mercury contaminated the bay's sediments and resulted in a fish and shellfish consumption ban.

Local citizens helped trustees and Alcoa identify restoration projects that best addressed this recreational fishing loss. With extensive input from community leaders and other residents, the trustees and Alcoa identified a series of restoration projects—such as improving several boat ramps and building piers for shoreline fishing—that addressed the injuries and met the communities' needs. At the date of printing, this settlement was pending.



Improvements to Damage Assessment

Developing better tools

The NRDA process has matured dramatically since the Exxon *Valdez* oil spill in 1989. Laws and technical practices have been refined and scientific and economic methods have been tested through negotiated settlements and in court. Much of this practical experience has highlighted the need to refine some methods; strengthen cooperative efforts through better coordination at the federal, state, and local levels; and standardize NRDA approaches through international efforts with various countries and industries.

The Rapid Assessment Program enables DARP experts to arrive on the scene within hours of an incident. The program is only one example of how the federal government has used its capabilities during the past 10 years to improve the assessment and restoration process.

DARP economists have also been instrumental in developing a method known as habitat equivalency analysis (HEA) to determine the appropriate amount of compensatory restoration. For example, after a wetland is oiled, it may no longer provide suitable habitat for birds, support the organisms on which birds feed, or prevent erosion and flooding. The environment and the public suffer from these losses during the time it takes to restore the resources and services.

HEA provides a framework for estimating how much restoration is needed to *address injured resources over time*—that is, until the resources are returned to the condition that would have existed if the

spill had not occurred. Using the HEA method, DARP can determine how much restoration is needed to address specific injuries.

HEA has been used in many damage assessments—and successfully tested in litigation—to address injuries sustained over time. The method has been so successful that DARP economists now assist other state and federal agencies in using HEA.

Strengthening coordination efforts

Responding to industry requests for increased involvement and flexibility in the NRDA process, NOAA has developed the Cooperative Assessment Pilot Project (CAPP). CAPP allows the responsible party to implement restoration efforts without undermining the government's natural resource trustee responsibilities. Benefits to industry include certainty about its responsibilities for restoration, lower damage assessment costs, and reduced litigation risk. The environment benefits from faster and more efficient restoration.

DARP also organizes trustee coordination meetings in many regions so that state and federal trustees across the country can build partnerships and learn from the lessons of past assessments. These meetings strengthen relationships and establish clear points of contact *before* the next big oil spill or hazardous substance release. The meetings also help identify clear chains of decisionmaking within each state agency, and among trustees.

Furthermore, NOAA is working with other federal and state natural resource trustees to develop the first statewide Regional Restoration Planning Program for Louisiana. Under this innovative, proactive program, trustees will develop regional restoration plans to address oil spills on an ongoing basis. Regional restoration plans will identify:

- Resources that could potentially be injured by oil spills.
- Types of projects needed to address the injured resources.
- Restoration projects already underway or under consideration.

A regional approach to restoration will benefit the public, industry, natural resource trustees, and the environment by:

- Providing more opportunities for restoring harm caused by oil spills.
- Expediting the restoration of injured resources.
- Minimizing the cost of restoration planning and implementation.
- Reducing uncertainty by defining the assessment process and potential restoration projects in advance.
- Maximizing opportunities for partnership among responsible parties, trustees, and other public and private restoration efforts.

Expanding international efforts

DARP is also active on the international front. DARP experts have responded to requests from such countries as Australia, Honduras, and Uruguay for damage assessment training and program assistance, as well as to requests for technical advice on global pollution.

At the request of European Union officials, DARP consulted with the European Commission (EC) when it sought to create a compensatory framework for natural resource injuries. As a result, the EC developed a directive on environmental liability that aims to both prevent environmental injuries—including water pollution, biodiversity losses, and land contamination—and restore injured resources. Once the European Parliament and the Council of Ministers adopt the directive, member countries will have 2 years to implement it in national law.

DARP also participates in the International Maritime Organization's Legal Committee, the entity responsible for international treaties dealing with marine safety and environmental protection. DARP advocates for treaty inclusion of response and restoration protocols for oil spills and hazardous substance releases.

Finally, DARP officials participate in the U.S. observer delegation to the International Oil Pollution Compensation Fund. This activity has led to a unique partnership with the insurance industry: a Memorandum of Understanding (MOU) between DARP and the International Group of Protection and Indemnity Clubs, which provides insurance coverage for roughly 98 percent of the world's tanker tonnage. The MOU sets forth a cooperative process between DARP and the International Group for conducting damage assessments and restoring injured environments when tanker spills and accidents occur.

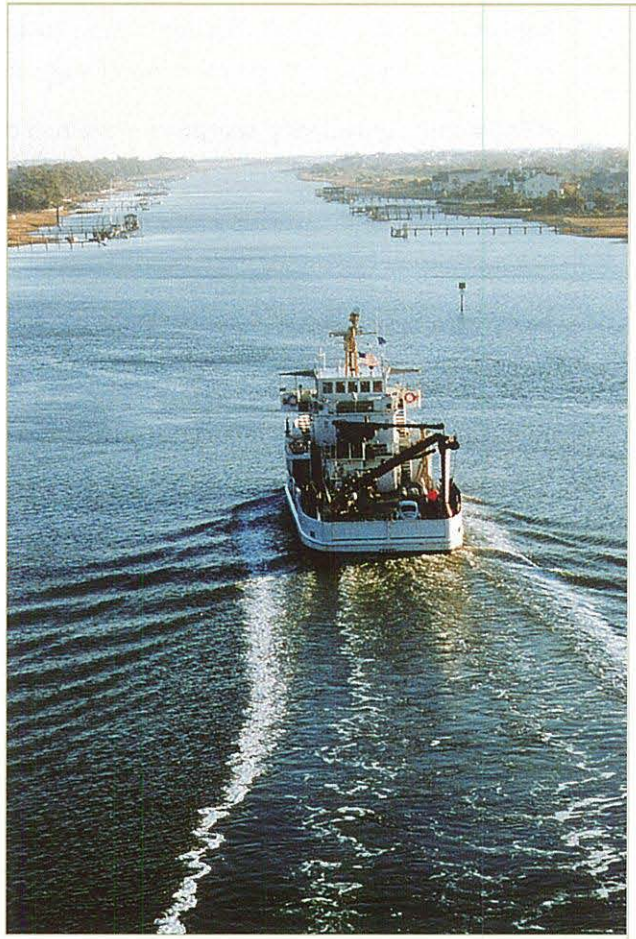
Reversing the tide

Natural resource damage assessment and restoration is a complex and sometimes a lengthy process because:

- Impacts on natural resources may occur over long periods of time.
- Scientific studies to assess injuries require time to develop, implement, and obtain results.
- Working cooperatively with parties responsible for the pollution and negotiating to ensure polluters pay for assessment and restoration can also be time consuming.
- Undertaking assessment and restoration efforts typically involves citizens and numerous local, state, and federal agencies, as well as the polluters.

NOAA continues to move forward to meet these challenges. Quick and effective restoration is essential to reverse the tide of coastal degradation.

Glossary



anadromous species – Fish that spend most of their life in saltwater but migrate into freshwater to spawn.

CERCLA/Superfund – The acronym for the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) in 1986, often referred to as Superfund. The federal statute establishes liability for site cleanup, prescribes a procedure for identifying and ranking contaminated sites, provides a funding mechanism for site cleanups, reduces uncontrolled releases of hazardous substances, establishes cleanup procedures that provide protection for humans and the environment, and restores injured natural resources through provisions administered by the natural resource trustees.

cooperative assessments – Assessments that are done cooperatively after an oil spill or hazardous substance release by trustees and the party responsible for the incident. This cooperation generally results in faster, more efficient restoration of injured natural resources.

compensatory restoration projects – Projects to compensate for interim losses of natural resources and the services they provide—from the time of injury until recovery is completed.

CWA/Clean Water Act – The law (also called the Federal Water Pollution Control Act) that established the programmatic and regulatory framework for restoring and maintaining the chemical, physical, and

biological integrity of the nation's waters. The CWA generally prohibits discharges of oil and hazardous substances into coastal or ocean waters. The 1973 amendments mandated the development of a National Contingency Plan (NCP) that would "provide for efficient, coordinated and effective action to minimize damage from oil and hazardous substances discharges, including containment, dispersal, and removal of oil and hazardous substances." The NCP governs the actions of all federal agencies involved in responding to oil and hazardous material releases. It also defines roles for agencies that are natural resource trustees.

DARP/Damage Assessment and Restoration Program – A multioffice program within NOAA involving the National Ocean Service, the National Marine Fisheries Service, and the Office of General Counsel. DARP scientists, economists, and attorneys conduct natural resource damage assessments of and restoration projects for coastal and marine resources injured by oil and hazardous material releases.

DDT/dichloro-diphenyl-trichloroethane – A chemical compound commonly used as a pesticide until it was banned in the U.S. in 1972. However, DDT is still used in other parts of the world. DDT remains in the environment for many decades, accumulates in living creatures, and poses health hazards to humans, wildlife, and fish.

EPA/U.S. Environmental Protection Agency – A federal agency with the mission to protect human health and the environment.

FWS/U.S. Fish and Wildlife Service – An agency of the U.S. Department of the Interior with the mission to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of all people.

habitat – The place where organisms (e.g., human, animal, plant, microorganism) live, including both living and nonliving surroundings.

HEA/habitat equivalency analysis – A method developed by NOAA for estimating how much restoration is needed to replace the loss of natural resources from the time they are injured until they are returned to the condition they would have been in had the release not occurred.

hazardous substance – Substances identified as posing "imminent and substantial danger to public health and welfare or the environment." CERCLA has identified more than 800 hazardous substances. The term does not include petroleum or natural gas.

injury – An observable or measurable adverse change—including destruction, loss, and loss of use—in a natural resource or impairment of a natural resource service.

injury assessment and restoration planning – The second phase of a natural resource damage assessment. Trustees identify the injuries to natural resources and their services and use that information to determine the need for and amount of restoration.

marsh – An emergent wetland seasonally flooded or usually wet and often dominated by one or a few plant species. Marshes can be either freshwater or saltwater.

National Marine Sanctuaries – Marine areas identified for their biodiversity, ecological integrity, and cultural legacy that are protected by law.

National Marine Sanctuary Act – Legislation designed to identify, designate, and manage areas of the marine environment that are of special national significance due to their conservation, recreational, ecological, historical, scientific, educational, or aesthetic qualities.

natural resource services – Ecological and human services provided by natural resources that may be injured after an oil spill or hazardous substance release. Ecological services include flood control, sediment stabilization, and habitat. Human services include fishing, beachgoing, and wildlife viewing.

natural resource trustees (trustees) – Government entities that protect, manage, and restore the natural resources that are held in trust for the benefit of all people and future generations. Trustees include the U.S. Departments of Commerce, Interior, Defense, Agriculture, and Energy; state agencies; and Native American tribes. NOAA is the lead federal trustee for coastal and marine resources.

nutrient cycling – The continuous cycling through an ecosystem of minerals, compounds, or elements that promote biological growth or development.

NOAA/National Oceanic and Atmospheric Administration – A U.S. Department of Commerce agency whose mission is to describe and predict changes in the earth's environment and to conserve and manage the nation's coastal and marine resources to ensure sustainable economic opportunities.

NRDA/natural resource damage assessment – Investigation performed by trustees to identify and restore natural resources injured by oil spills and hazardous substance releases. The goal of NRDA is to restore natural resources.

OPA/Oil Pollution Act of 1990 – Legislation designed to prevent oil spills, ensure cleanup if they happen, and restore natural resources injured by these spills.

PCBs/polychlorinated biphenyls – A class of chemicals previously used in manufacturing that remain in the environment for many decades, accumulate in living creatures, and pose health hazards to humans, wildlife, and fish.

preliminary assessment – The first step in a natural resource damage assessment, in which trustees determine whether injury to public trust resources has occurred or is likely to occur.

primary restoration projects – Projects to restore natural resources injured by oil or hazardous substance releases to the condition that would have existed if the incident had not occurred.

RAP/Rapid Assessment Program – An effort undertaken by the Damage Assessment and Restoration Program to collect perishable data and readily available information to determine the need for a natural resource damage assessment.

responsible parties – The parties (e.g., individuals, companies, or government agencies) responsible for an oil spill or hazardous substance release.

restoration – The goal of a natural resource damage assessment, which involves rehabilitating, replacing, or acquiring the equivalent of injured natural resources and the services they provided. Restoration includes both primary and compensatory restoration projects.

sediment – Loose particles of sand, clay, silt, and other substances that settle at the bottom of a water body. They come from eroding soil and from decomposing plants and animals. Wind, water, and ice often carry these particles great distances. Many sediments in rivers, lakes, and oceans are contaminated by pollutants, such as DDT and PCBs.

settlement – An agreement between natural resource trustees and responsible parties that specifies the terms under which liability is resolved.

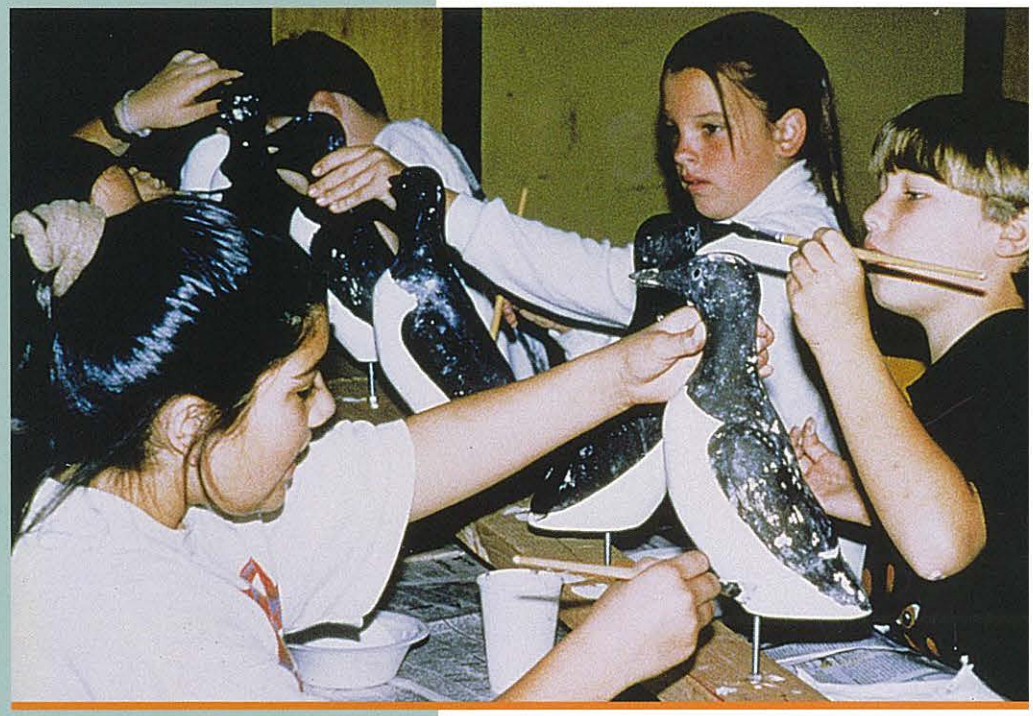
trustees – See *natural resource trustees.*

U.S. Coast Guard – A federal agency that responds to oil and hazardous substance releases and cleans up or contains the release in an effort to protect public health and the environment.

wetlands – Transitional areas between uplands and water that are subject to periodic flooding or prolonged saturation and contain specific plant communities and soil types. Wetlands can be classified as either tidal—within the reach of the tides—or nontidal. Both serve important ecological functions.

Thousands of seabirds injured by oil—and restored

More than a decade ago, a barge discharged 20,000 gallons of crude oil, coating California's beautiful coastline from Point Reyes to Monterey. The oil spill killed more than 9,000 seabirds and devastated the common murre colony at Devil's Slide Rock just south of San Francisco. NOAA, the U.S. Fish and Wildlife Service, and the State of California estimate that 6,000 murres died as a result of the spill. Trustees sought damages from the responsible parties and the case was settled for more than $6 million. These funds have helped restore the common murre colony through a unique project that employs a technique called "social attraction" to lure birds back.



The ongoing restoration project, led by the U.S. Fish and Wildlife Service, uses decoys of adult murres, decoys of murre chicks and eggs, recorded murre sounds, and three-sided mirror boxes to attract the birds back to Devil's Slide Rock. Murres began landing at the breeding site within 24 hours of the start of this unusual restoration project. The number of murres breeding on the rocks has continued to increase each year. As the birds increase, NOAA and co-trustees come closer to meeting their goal: restoring the common murre breeding colony after the devastating oil spill.

NOAA acts as a trustee on behalf of the public to restore coastal and marine resources injured by oil spills and hazardous substance releases.
To learn more, please contact—

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