



Transforming Remediation Sites Into Conservation Assets

How Companies Leverage Business Needs for Positive Environmental Outcomes

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Boeing worked with federal and state agencies and local tribes to restore the Duwamish Waterway shoreline habitat in Seattle, WA.

Message from our sponsor

Remediate. Restore. Revitalize.

In our pursuit of global environmental leadership, we champion the value of going above and beyond compliance. Our robust remediation and restoration program exemplifies this approach. Put quite simply, our goal is to leave places better than we found them.

At Boeing, we have a long-standing commitment to clean up locations affected by past manufacturing activity or waste disposal. We have an experienced team dedicated to using innovative and comprehensive solutions to ensure the protection of human health and the environment.

We take pride in the work we've done to restore and return land to beneficial use. And we are proud to be recognized for that work by the EPA, and other federal and state agencies and organizations.

We can't do it all by ourselves. There's another 'R' that is fundamental to fulfilling our commitment: Relationships. We rely on collaboration with neighborhood groups to find the best solutions.

We partner with wildlife and conservation organizations to create and restore wildlife habitat.

They are the true experts. And they share our passion.

As part of the Wildlife Habitat Council (WHC) certification program, Conservation Certification, we have restored nearly 1,000 acres of habitat — from wetlands that support salmon to replanting efforts that benefit pollinators. We currently have four remediation sites with WHC Conservation Certification and we expect that number to grow substantially in the next few years. We are also expanding our partnership with WHC to pursue certification at some of Boeing's active manufacturing sites.

As we look ahead to Boeing's next century, we see a bright future on the horizon. We will continue to do our part to build a better planet.

*Steve Shestag
Director, Environment
Environment, Health & Safety
The Boeing Company*

On the cover: A Humboldt's lily grows at the Boeing former Santa Susana Field Laboratory in Simi Valley, CA.

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Introduction

Environmental remediation approaches, once viewed merely as mandated activities designed to protect human health, are moving beyond simply meeting regulatory requirements into an approach that looks at the broader picture. Increasingly, companies are adopting green and sustainable remediation practices as part of the remedy. They are utilizing their remediation sites to create wildlife habitat, support local conservation priorities, and build green spaces for the community. By using conservation-based approaches to site cleanup and reuse, companies are doing more than simply returning sites to their former states, but are instead leveraging conservation to transform liabilities into ecological, community and corporate assets.

Incorporating conservation into the remediation process can have a multitude of benefits, with the most obvious being the benefits to biodiversity and environmental health. The surrounding community can also benefit greatly from this approach. Property values near Superfund sites tend to increase once cleanup begins and again after a site has been de-listed.¹ Cleanup sites with ecological outcomes can also result in increased tax revenues, tourism, air and water quality, and improvements to overall quality of life for residents.²

Conservation-based approaches have the additional benefit of helping companies meet some of the business needs that can arise during the remediation process. Common business needs associated with cleanups include:

- **Meeting stakeholder priorities**
- **Facilitating permitting and remedy selection**
- **Reducing costs**
- **Minimizing harm to habitats and wildlife caused by remedial infrastructure and operations**
- **Improving negative community perceptions of the site**
- **Identifying beneficial and sustainable reuse of the property once the remedy is completed**

Fortunately, there are a multitude of conservation and conservation education opportunities that responsible parties can implement during the various phases of the remediation process to help address these business needs while also producing positive outcomes for ecology and community. These opportunities will depend on the types of habitats



A bumble bee at Boeing's Pollinator Prairie, a former cleanup site in Olathe, KS.

and species that occur on-site, as well as factors such as what stage the remediation process is in, whether there are site access restrictions and what resources are available for voluntary activities. Best practices show that incorporating conservation early in the remediation process produces the strongest outcomes for the local ecosystem, community and business. For example, during investigation or remedy selection and permitting, conservation objectives can drive solution development and selection, address concerns and priorities raised by stakeholders, motivate the inclusion of green and sustainable best management practices and, in some cases, reduce costs. There are instances, however, when integration of conservation-based approaches is not possible early in the process, but may be implemented during later phases, such as restoration of the site to a productive reuse or a return of the site to the community for recreational use.

This white paper will share case studies of companies that have applied conservation-based solutions at different points during the remediation process.

Each case study will demonstrate how conservation has been leveraged to meet a variety of business needs faced during site cleanups, as well as how remediation sites can make valuable contributions to both people and planet.

Five phases of the remediation process

The remediation process generally consists of five phases: **Investigation, Remedy Selection and Permitting, Implementation, Maintenance and Monitoring, and Restoration and Site Reuse**. Although this process will vary for an individual site depending on the regulatory framework in which it operates, each phase represents a unique set of conservation opportunities that can be used to address business needs.

PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Investigation	Remedy Selection and Permitting	Implementation	Maintenance and Monitoring	Restoration and Site Reuse
				
Study and exploration of the site to create a baseline confirming and quantifying the type, location and extent of any contamination present. This may include sampling the soil, subsoil, groundwater, surface waters or remaining structures.	Negotiations among responsible parties, regulatory agencies and stakeholders. Possible remedies are evaluated and quantifiable cleanup goals are identified before the final remedy is approved. This phase also includes securing permits from regulatory agencies to perform the prescribed work.	Execution of remedial activities, such as removal of contaminated soil, construction and operation of pump-and-treat systems or installation of impermeable caps to contain contamination.	Long-term, responsible stewardship to ensure both the integrity of the cleanup and the functioning of any associated ecosystems created or otherwise impacted during cleanup operations. ³	Completion of the remedy and a return of the site to a productive and beneficial state.

Strategies to incorporate conservation into cleanup sites

Following are conservation programs that have successfully addressed business needs by integrating conservation goals into one or more phases of the remediation process. Each of these programs has achieved recognition for their efforts through [WHC Conservation Certification](#), which provides rigorous, third-party certification for conservation and education activities, including those that might occur on a cleanup site.



Improving public perception

In the early stages of a site cleanup, public perception of the site and its operations may represent significant challenges. These may result from: issues created by the contamination or cleanup operation; harm caused to human health; impacts to local recreation; species of concern or important natural resources; or disagreements among stakeholders. These issues can be sensitive and difficult to address, and often require a thoughtful, multi-pronged approach.

Incorporating conservation activities that benefit ecology can improve community acceptance of remediation, particularly if local stakeholders are involved in the process.⁴

CSX Transportation's Former Gautier Oil Site incorporated conservation and recreation goals into its remedy to address the needs of the surrounding neighborhood, demonstrate the site's ecological and social value, and establish goodwill with the community.

Situated on the banks of the West Pascagoula River and Bayou Pierre in a largely residential area of southeastern Mississippi, the 24-acre Former Gautier Oil Site was historically used for wood treatment operations using creosote and possibly hydrocarbon extender oils from 1870 to 1979, and then for waste oil recycling until 1983. In 1985, responsible parties entered into an Administrative Order of Consent with the U.S. Environmental Protection Agency (EPA), removing above-ground structures and possible sources of below-ground contamination. Final remedial construction began in early 2011 and was completed in December of that year, and included restoration of functional tidal wetlands with an artificial oyster reef, as well as transitional habitat between the wetlands and upland areas. The restoration design included dredging a channel in the wetlands deep enough to



Tidal wetlands on the West Pascagoula River at the CSX Former Gautier Oil Site in southeastern MS.

ensure that recreational boating along this stretch of the river could continue, as the remedy would have otherwise made this area too shallow.

In addition to wetland and transitional habitat, the team also implemented additional projects on-site to address environmental risk, including restoration of maritime forest habitat, open fields, and dune habitat, as well as ongoing control of invasive plants like phragmites and Chinese tallow throughout the site. Community members now have the opportunity to view wildlife from their homes or boats, and those who fish benefit from the improved fish habitat created

by the wetland restoration. In addition, removal of above-ground structures and development of green space through the restoration also improved the visual aesthetic of the site, converting a visual blight into a community asset. To preserve this green space for the community in perpetuity, CSX entered into a conservation easement with the Land Trust for the Mississippi Gulf Coast in 2013. The Former Gautier Oil Site first achieved certification with WHC in 2012.

Learning about the species and habitats on-site can help site teams determine the potential for conservation activities as part of their site cleanup.

One approach is to add ecological components such as habitat delineations or species surveys to existing data collection procedures like baseline inventories or long-term site monitoring, that provide information about the ecological condition of the site. This data can be used to identify potential conservation targets, set conservation objectives, make decisions during the cleanup process, or leveraged to demonstrate value to stakeholders and regulatory agencies.



Using biodiversity restoration to reduce costs

In some cases, conservation activities can provide opportunities to reduce costs for remediation or stewardship. For example, the impermeable cap often used to contain contamination can only be planted with a non-woody vegetative cover to protect the integrity of the cap. The Conservation Foundation in Naperville, Illinois found that maintaining this vegetative cover as a native grassland or meadow, instead of non-native turf grass, saved over \$85,000 USD per acre over 10 years as a result of reduced costs for mowing, watering, controlling grubs and pests, fertilizing and aerating.⁵

Proposing biodiversity restoration or community engagement elements can strengthen the case for cost-lowering remedies, such as those that involve less construction and minimize habitat disturbance. The inclusion of these elements in the proposed remedy serves to demonstrate goodwill and proactivity by the responsible party, and can help address concerns of community members and regulatory agencies and meet stakeholder needs. In many cases, it can often lead to faster remedy negotiations and permitting.

Bridgestone Americas' New Beginnings – The Woodlawn Wildlife Area (New Beginnings) in Port Deposit, Maryland is an example of a cleanup site where conservation goals were leveraged to negotiate a less-costly long-term remedy that saved the company approximately \$36 million USD and returned the site to the community expeditiously.⁶

New Beginnings comprises 95 acres of grassland, woodland and wetland habitats in a rural area of northeastern Maryland. The site includes a 35-acre closed landfill, which was listed as a Superfund site in 1987 for groundwater contamination caused by the disposal of industrial waste for several decades prior to its closing in 1981. Although a Record of Decision was finalized in 1993, further studies documented natural attenuation (the breakdown of contaminants by soil bacteria), as well as evidence that the site posed no immediate threats to human health.

Given this information, Bridgestone elected to work with WHC to develop an ecological reuse vision for New Beginnings. Bridgestone successfully leveraged this vision to negotiate an update to the long-term remedy that would include a permeable, vegetated



An eastern box turtle at the Bridgestone New Beginnings site in Cecil County, MD.

cap on the landfill along with continued monitoring of the natural attenuation. At a projected cost of approximately \$6 million USD over 15 years, this new remedy resulted in a significant cost savings compared to the original remedy, which involved a pump-and-treat system costing over \$42 million USD.⁷ In addition, the new remedy provided additional benefits to the site by allowing existing habitat areas that would have been impacted by construction activities to remain undisturbed, and allowed Bridgestone to open the site to public access much more quickly. Today, New Beginnings is managed as an ecological and educational resource for the local community.

A multitude of habitat and wildlife management projects are maintained on the site with the help of local partners such as Master Gardeners, youth groups and students from several nearby schools. These projects include invasive species control, nest box monitoring, and management of the pollinator gardens, man-made vernal pool, grasslands, and woodlands, as well as numerous opportunities for young learners to engage in participatory learning.

New Beginnings' conservation and education efforts have been certified with WHC since 2001.

The necessary role of government. Assigning clean-up responsibility may be difficult if the act is decades removed from the original contamination. In some cases, the remediation obligations are inherited as legacy liabilities through mergers and acquisitions, while in others the accountable party may no longer even exist, leaving the burden for clean-up with the government. In addition, communities coexist with a blight over which they have no control. With such complexity, government plays an essential role, providing the regulatory framework necessary to ensure orphan sites are not forgotten, responsible parties are held accountable, and community needs are met.

Providing green space for education and recreation

Conservation and education activities can have a significant impact regardless of size — particularly in neighborhoods with socio-economic challenges. A remediation site can be transformed from neighborhood blight into highly-valuable resources for both wildlife and the surrounding community.

A need for green space or educational resources in an area can be identified during the site investigation phase by gathering baseline social metrics. This process can help determine gaps in conservation or STEM (science, technology, engineering and mathematics) education, or lack of outdoor learning spaces that could potentially be met through the cleanup or reuse of the site. If this data cannot be gathered during the investigation, other opportunities to assess community and ecological needs may occur later in the process, such as during public comment on the proposed remedy, or as part of stakeholder engagement efforts to help determine site reuse.

Motorola Solutions' NGTF Habitat in Scottsdale, Arizona is a notable example of a small cleanup site that contributes to the local community, provides green space and enhances community connectivity, and reduces impacts by salvaging high-value trees.

Built in 2011, Motorola Solutions' NGTF Habitat includes a groundwater treatment facility and 1.7 acres of actively-managed habitat. The site is part of the North Indian Bend Wash Superfund Site remedy. When the property was acquired by Motorola in 2011, the site team began removing debris and constructed a granular activated carbon water treatment facility, which was completed in 2013. The team then began the installation of a native landscaping project, designed in close partnership with local experts from the City of Scottsdale, Master Gardeners, local nurseries and environmental consultants. The team planted an array of native, drought-tolerant plant species selected to benefit pollinators and other wildlife. These plants included mesquite trees that the team carefully salvaged prior to construction of the water treatment plant in 2011, as well as several caterpillar host plants and native cacti that provide important habitat for bees.



Diablo eyelash sage at Motorola Solutions' NGTF Habitat in Scottsdale, AZ.

To maintain the habitat area, the team uses Integrated Pest Management practices, which helps manage insect pests and weeds using techniques that cause the least harm possible to the native plantings and wildlife. Part of the habitat design also included the installation of a pathway through the habitat area that provides the community with easy viewing of the site's habitat and access to the nearby Arizona Canal Trail. The NGTF Habitat site team also engaged a local artist to create public art installations inside the garden using recycled materials, and registered the site as a stop on a local public art tour. The project continues to provide valuable wildlife habitat and public green space for education and recreation, thereby serving as a small but highly valued community asset in urban Scottsdale.

The program at NGTF Habitat was first certified by WHC in 2015.

Remediation sites, locations of past industrial misuse or accidents, are found across the world. These sites can be small, resulting from a single source of localized harm, or large with multiple sources of harm across many acres. Most sites, regardless of location, size or type of harm, have the potential to contribute to the community through conservation.

Managing a restricted site with an event-based approach

Sites under long-term maintenance during the remediation process present numerous opportunities for implementing and monitoring conservation-based efforts. These sites commonly require periodic assessments of remedy implementation and stewardship, such as Superfund Five Year Reviews (FYRs). These assessment periods provide opportunities to evaluate existing conservation activities to determine if they are meeting objectives, and to incorporate new conservation activities into site stewardship.⁸

Long-term maintenance often necessitates limited access to a site due to concerns such as safety and liability. Although this restriction can influence the types of conservation activities that can be carried out, biodiversity conservation can be implemented with great success on both limited access and public access sites.

The Chemours Newport Site in Newport, Delaware, is engaged in a long-term maintenance and monitoring process. Due to site access restrictions, the site's wildlife habitat program is managed by a small, dedicated team of employees based at a corporate office nearby.

The Chemours Newport Site, currently 92 acres of freshwater wetland, deciduous forest and meadows, is a closed, former pigment manufacturing operation that utilizes a pump-and-treat system to address groundwater contamination. With the site under a period of long-term maintenance during its remedial process, Chemours decided to utilize the property to create wildlife habitat and engage company staff based out of a nearby office complex in habitat management activities. The site is fenced and requires special permission for access, so the team created conservation projects that can be managed by a team of employees who visit the site several times per year, with additional assistance from partners such as the Delaware Department of Agriculture and Monarch Watch.



A sunflower in a pollinator meadow at the Chemours Newport Site in Newport, DE.

*Habitat projects include pollinator meadows, tree swallow nest boxes, and biological control of invasive purple loosestrife using *Galerucella* beetles. The Chemours team has creatively integrated these activities into company operations, helping to minimize the effort required to maintain and monitor the projects. For example, contractors and staff visiting the site to perform scheduled maintenance and monitoring are also engaged to perform habitat maintenance. To implement habitat updates, the team uses an event-based approach; a series of four planting events are scheduled during quarterly employee and contractor volunteer visits to the site to plant new native species in the pollinator meadows, pull weeds and perform nest box maintenance.*

The Chemours Newport Site conservation program first achieved WHC Conservation Certification in 2012.

The initial site investigation might reveal opportunities to reduce the impacts of remedy construction and operations on habitats and wildlife.

This could involve the salvaging or relocation of sensitive or rare plants or wildlife, adjusting the location of infrastructure to minimize fragmentation, or adjusting activities during sensitive periods for breeding birds or other species.⁹

Meeting community needs through site reuse

In general, determining the end use of a cleanup site is a key factor in remedy selection and design, and can guide appropriate selection of conservation projects.¹⁰ Many times, restoration planning offers opportunities to incorporate conservation or ecologically focused reuses, which can often help to meet objectives identified by stakeholders and community members. Conservation-focused reuses can easily be paired with community-focused reuses such as native gardens or nature trails alongside recreational areas or community spaces.

BASF Corporation's 1,200-acre Fighting Island, located on the Canadian side of the Detroit River in LaSalle, Ontario, has been transformed into a resource for local schools and community members with biodiversity restoration projects and educational facilities.

For much of the 20th century, Fighting Island was used for the disposal of alkaline by-products created from the manufacture of soda ash and other lime-based products. These by-products dried to a fine dust that blew onto the mainland, causing air quality and siltation issues. Beginning in the 1970s, BASF used settling dikes and revegetation efforts to reduce erosion and dust blow-off to the mainland while also creating wildlife habitat. The site team further elected to develop habitat areas and outdoor learning spaces as a long-term reuse for the local community.

BASF currently maintains multiple conservation projects on the island, including invasive species control, native tree and shrub plantings, bat houses, pollinator habitat, and native game bird reintroductions. Notably, BASF has constructed educational facilities such as classrooms and wetland



A great blue heron flying above BASF's Fighting Island in LaSalle, Ontario, Canada.

boardwalks, and hosts thousands of local students, teachers and scouts every year. The site functions as an outdoor learning laboratory for students and youth groups, who benefit from the custom standards-based STEM education curriculum developed in partnership with local teachers, as well as for teachers, who benefit from semi-annual teacher trainings.

The conservation program at BASF Fighting Island has been WHC-certified since 2002.

Ecological data collected on-site can be used to identify which habitats, species, or resources may be impacted by the cleanup.

Once identified, responsible parties can use maintenance and monitoring activities to track those potential impacts. This can be of particular importance in cases where ecotoxicology or other harm to wildlife is a concern, or where disturbance has left the site vulnerable to invasive species infestation. In these cases, procedures such as Hazard Assessment and Critical Control Point (HACCP) and Early Detection/Rapid Response (EDRR) could be put into place to catch potential impacts early.



A call to action for corporate landowners

The case studies highlighted in this white paper, and the dozens more recognized by WHC Conservation Certification, demonstrate the diverse array of opportunities to leverage conservation and conservation education during one or more phases of a remediation project's life cycle to meet business needs.

Projects can be small or large in size and scope. They can be in rural, suburban or urban areas. Their end use can be accessible to the public or restricted. But they all have the potential to not only benefit biodiversity and the local community, but also to meet business needs and establish companies as sustainability leaders.

Stakeholders often perceive a barrier to implementing conservation and education activities on cleanup sites, resulting from a lack of incentives to doing so. Achieving third-party recognition for these activities through programs such as WHC Conservation Certification is one way to combat these perceptions and provides a tangible incentive to integrate conservation and education into the remediation process.¹¹



Monitoring the grassland at the Boeing Emery Landfill in Wichita, KS.

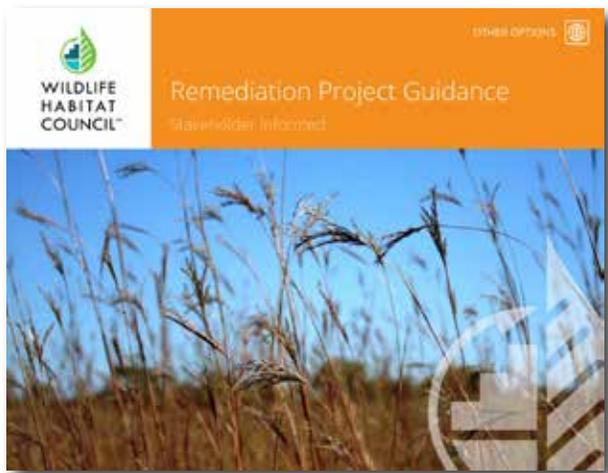
Steps companies can take to incorporate conservation and education into their cleanup sites

- Assess the existing ecological conditions on-site and in the surrounding landscape to determine the potential for conservation activities.
- Consider ways to incorporate ecological benefits into the cleanup as early as possible in the remedial process, such as during site assessment and remedy negotiation.
- Consult with the surrounding community and other stakeholders to determine community needs for conservation education and green space, and to determine the potential for incorporating education and outreach activities.
- Download the [WHC Remediation Project Guidance](#) to assist you in designing a project that will have a meaningful conservation and education impact. The Project Guidance describes how to build a sound conservation project on a cleanup site and provides strategies to strengthen programs for greater outcomes.
- Demonstrate the success of your conservation programs by seeking [WHC Conservation Certification](#), a rigorous, third-party standard. Through the WHC Remediation Project theme, as well as other relevant Habitat, Species, and Education and Awareness themes, WHC Conservation Certification recognizes and incentivizes proactive, beneficial actions taken as part of a cleanup that enhance project outcomes, such as integrating conservation early in the process, or involving the community in project design and implementation.

Companies that adopt and integrate conservation best practices across their entire remediation portfolios set a new standard within the industry and create positive, measurable and meaningful impacts to ecosystems and communities.

Endnotes

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Download the Remediation Project Guidance and other Project Guidances at wildlifehc.org/project-guidances

Thank you to Boeing for underwriting the production of this publication.



As you develop your site's remedial design, enter the construction phase, look to maximize the ecological and community value of your portfolio, or strategize for divestiture, WHC can help identify how conservation can support your objectives. If you're interested in exploring these opportunities, please contact us at strategyandplanning@wildlifehc.org.

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