

RioTinto

Protecting  
biodiversity at  
Great Salt Lake

On the ground at Kennecott Utah Copper

# “The procedures used and the success realised should serve as examples for future wetland mitigation planning.”

Association of Engineering Geologists

Rio Tinto's Kennecott Utah Copper has created a biodiversity offset near Utah's Great Salt Lake in the US, that is demonstrating how environmental offsets can be used to alleviate habitat losses associated with mining and refining.

Our approach has gone beyond meeting statutory requirements, creating a new wetland site that provided valuable habitat, and now supports the existing ecosystem, benefiting the surrounding communities as well as the local fauna and flora.

We are committed to achieving a “net positive impact” on biodiversity. This means minimising the impacts of our business and contributing to biodiversity conservation to ensure a region ultimately benefits as a result of our presence. We aim to achieve this by first reducing our impacts on biodiversity values through avoidance, minimisation and rehabilitation.

We then aim to achieve a positive impact with the use of biodiversity offsets and additional conservation actions. This is part of our standard environmental practice, where for a number of years we have developed and implemented practical programmes for the management of energy use, emissions, water, mineral and non-mineral waste and air quality, as well as biodiversity. We also aim to achieve positive effects through the use of offsets and additional conservation actions.

At Kennecott Utah Copper, we needed to expand our tailings impoundment, where benign ground up rock is stored after the metals have been extracted. But due to the limitations of the land available, the only ground suitable for the expansion was a land area that included wetlands. Most wetlands around Great Salt Lake are considered rich in avian biodiversity – they're a key stopover along North America's Pacific/Central Flyway for nesting and migratory shorebirds and waterfowl.

Cover: A sunrise view of the ISSR. The Kennecott smelter stack is a visible land mark which sits at the northern tip of the Oquirrh Mountains.

So before we proceeded, we talked to experts outside Rio Tinto, who became integral to the design and implementation of our offset plan: the US Army Corps of Engineers, the US Fish and Wildlife Service, the US Environmental Protection Agency, the Utah Division of Wildlife Resources, the Nature Conservancy, and the National Audubon Society.

We needed to expand the tailings impoundment by approximately 1,460 hectares and wanted to create an improved wetland area of at least 427 hectares for our mitigation efforts – the minimum regulatory requirement for such an area in the US. We wanted our mitigation area to be bigger than the biodiversity-rich wetlands affected by the expansion. Our intention was to create more than a “net positive impact” – which we consider the mark of a true biodiversity offset. We also wanted the land for our offset to be “degraded land”, which we would restore.

The site we chose was located on the southern shores of Great Salt Lake, about 20 miles west of Salt Lake City. We purchased the plot in 1996: 1,011 hectares, now known as the Inland Sea Shorebird Reserve (ISSR).

The area was ideal. It provided the physical terrain and water for nesting and migratory habitat, and has grown to be rich in insects and macro invertebrates to nourish the birds.

Before we started restoration, we gathered data on the area’s bird occupancy so we could compare future data and gauge our mitigation and offset success. We made a plan for restoring and enhancing the habitat, and a long term maintenance and five year monitoring programme was designed with the outside experts and regulated by the US Army Corps of Engineers.

There are three key elements to healthy water bird life: safety from predators, nesting grounds and ample food sources. And that goes for both migratory and resident water birds. After years of pollution, livestock grazing, and misuse, the land we chose to restore had been left unproductive and there were a few obstacles to overcome before the environment was suitable for its inhabitants. We stopped cattle grazing, banned off road vehicle use, put up fencing, and to provide reliable water flows to natural ponds we constructed water conveyances and installed small dikes on the ponds.



Construction of the Kennecott tailings impoundment, near Great Salt Lake, was offset by the ISSR to the north.

We started restoring the site in May 1996, removing the garbage that had been illegally dumped on the land over the years, and creating the pond dikes. We initially proposed to build five ponds. Then we decided to purchase the land next to the ISSR and create a “wetlands bank”, comprising four ponds, which increased the reserve size to more than 1,460 hectares. The bank provided flood control, served as a buffer to the mitigation site, and would provide more opportunity for biodiversity offsets.

The idea was that this would not only enhance available bird habitat and the biodiversity of Great Salt Lake, but we could use the bank to mitigate future expansion. The bank also provided the potential new business opportunity of selling “mitigation credits” to anyone that wanted to mitigate their own impacts on biodiversity, under a public biodiversity mitigation credit trading scheme.

Without grazing cattle and illegal trespass, natural habitat quickly recovered. And in February 1997, when we introduced water flows, birds flocked in. Cinnamon Teal, Snowy Plovers, American Avocets, Wilson’s Phalaropes, Northern Shovelers, heron, egrets and dozens of other species of shorebirds, waders, and waterfowl quickly began to use the ponds, wetlands, and surrounding upland habitats throughout the year.

In 2002, at the end of our regulatory monitoring obligations, we were able to demonstrate the great value of the ISSR to Great Salt Lake’s ecosystem. Waterbird counts surpassed baseline conditions by margins ranging from just under 2,000 per cent to nearly 4,000 per cent. We recorded substantial increases in all water birds and all long distance migratory shorebirds and in most shorebirds.

More than 150 bird species were sighted in 2002, on the reserve, including Snowy Plovers, American Avocets, American White Pelicans, Caspian and Black Terns, Sage and Grasshopper Sparrows, Peregrine Falcons, Swainson’s Hawk, and Burrowing and Short-eared Owls. Eight are listed as threatened and endangered species, or species of special concern, by the US federal and state governments. Three are on the IUCN red list: the Long-Billed Curlew, Brewer’s Sparrow, and Cassin’s Finch.

While not all species noted in the original monitoring have increased since the ISSR was created, for the five years of monitoring, overall bird counts increased enormously over baseline conditions. And it wasn’t just bird counts that improved.

Water quality in the main site improved to meet the US's Environmental Protection Agency's freshwater life standards, while that in the wetlands bank compared favourably to local, saltier reference data. Vegetation, both terrestrial and aquatic, also improved, providing better cover and consequently more bird food in the form of insects and macro invertebrates.

**The Inland Sea Shorebird Reserve is now used by an estimated 120,000 shorebirds, waders, and other waterfowl every year. To date, approximately 200 bird species have been recorded.**

The reserve also provides a measure of protection for the southern shoreline of Great Salt Lake by preserving the landscape in a natural setting. Since 75 per cent of Utah's wetlands are located around the lake, development poses a significant risk and our reserve plays a valuable role in wetlands conservation. Its value is complemented by adjacent properties on the reserve's north and southwest flanks, managed by the National Audubon Society for shorebirds.

Our statutory obligation to perform surveys of the ISSR for the US Army Corps of Engineers ended in 2002 and the site continues to provide a valuable resource for wildlife research. Researchers from the Utah Division of Wildlife Resources, Utah Department of Environmental Quality, Utah Department of Transportation, University of Utah, and Brigham Young University have visited the reserve to study various wildlife species and vegetation.



The ISSR is now recognised as one of the largest and most successful mitigation projects in the US. In 1999 the site was designated the Outstanding Environmental and Engineering Geologic Project by the Association of Engineering Geologists, which noted: "The procedures used and the success realised should serve as examples for future wetland mitigation planning." In 2004, the site, as part of a larger ecological unit (Gilbert Bay), was recognised as an Important Bird Area by BirdLife International and National Audubon.

The ISSR is a great way of ensuring our actions have positive effects on biodiversity by providing successful mitigation implementation and biodiversity offsets above and beyond our project's impacts. And when we have finished with our tailings impoundment, we will rehabilitate it with native species providing additional mitigation.

Learn more at  
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