

# Creating a Silver Lining Out of Disaster?

By Ian Urquhart



Are there silver linings in environmental disasters? Perhaps. Environmental disasters can mobilize public opinion. They can put pressure on corporations and governments to take action to try to prevent future disasters. London's Great Smog of 1952, DDT, Cuyahoga River, Love Canal, Exxon Valdez are all names associated with environmental disasters that sparked efforts at positive change. This article looks at a homegrown disaster – the Obed mine disaster – and the effort to try to generate something positive out of calamity.

## The Obed Mine Disaster

At least a few of those who oppose the Alberta government's efforts to revive coal mining in the Rockies likely remember a very nasty trick one coal mine played on Alberta's environment on October 31, 2013. That Halloween witnessed a catastrophic failure of an earthen dam at the Obed Mountain Mine east of Hinton. When Dyke E breached it unleashed a torrent of approximately 800,000 cubic metres of water and material from a mined-out pit. This waste stream rushed downhill into the mine's main tailings pond. In turn, the tailings pond couldn't handle a surge of such volume. The mine waste overtopped the tailings pond, sending about 670,000 cubic metres of wastewater rushing down Apetowun and Plante Creeks into the Athabasca River.

It's hard to wrap your head around such a gigantic volume of wastewater – 670,000 cubic metres. How much waste was this? This torrent released as much water as ALL

of Calgary's residents and businesses used over an average 36-hour period in 2019 – a day and a half's worth of water. Water from the tailings pond flowed into the Athabasca River for nearly two days.

This toxic wave seriously gouged and tore apart the streambed and banks of the uppermost portion of the Apetowun Creek. Nearly all riparian vegetation along the creek was washed away. Large quantities of sediment were deposited in its place. In some places, one to two feet of contaminated mud was left behind.

When Nick Pink wrote about this spill in the *Wild Lands Advocate* in September 2017 he said the spill was "considered one of the most damaging environmental disasters in Alberta history." No exaggeration there.

## Legal Consequences

In 2017, Prairie Mines and Royalty, a subsidiary of the U.S. coal miner Westmoreland Mining, pleaded guilty to violating federal and provincial fisheries/environmental legislation. It was fined \$4,425,000. The judge also ordered the company to



Electrofishing in Apetowun Creek PHOTO: © I. URQUHART





*Athabasca Rainbow Trout Caught by Electrofishing* PHOTO: © I. URQUHART

rehabilitate roughly five kilometres of Apetowun Creek, the most polluted and damaged creek.

In addition, Chief Ron Kreutzer on behalf of the Fort McMurray First Nation No. 468 launched a class action against the company. The settlement in that civil case provided funds to AWA to monitor the company's rehabilitation efforts. Hatfield Consultants is taking the lead in the Apetowun Creek restoration project.

## The Silver Lining

The restoration work could be the silver lining. In 2014, Athabasca rainbow trout (*Ondorhynchus mykiss*) were assessed as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). This status means the species faces

"imminent extirpation or extinction." In 2019 the federal government finally listed them as Endangered under the *Species at Risk Act* (the Act states that a species should be listed within nine months of a COSEWIC assessment). In September 2020 Ottawa released a final recovery strategy for this sub-unit of the rainbow trout species. Hybridization – the genetic mixing of pure strain Athabasca rainbow trout with other species such as non-native rainbow trout – was identified there as a high risk to Athabasca rainbows throughout their range (as were climate change and interactive/cumulative effects).

The restoration plan, in addition to restoring the streambed and riparian habitat, tackles the hybridization challenge. Its ob-

jective is to rehabilitate the upper five kilometres of the Apetowun Creek watershed and release pure strain Athabasca rainbows in those upper reaches. The goal is to establish a pure-strain Athabasca rainbow population of at least 100 fish in the upper segments of the creek. A fish barrier will be installed to prevent those pure strain rainbows from migrating down the creek and mixing with non-pure strains; similarly, the barrier should prevent non-pure rainbows from migrating into the upper reaches.

Ironically perhaps, extensive construction activities are needed in order to transform the watershed into one approximating its original condition. Matrix Solutions took the lead on the project's engineering. The creek bottom had to be dredged and replacement rocks sourced from elsewhere on the Obed Mountain Mine site. It took over a year to sift through and sort the replacement rocks by size. The largest rocks are located at the top of the creek's watercourse. This section is the most obviously engineered section of the project. It is heavily reinforced to ensure the water flow is diverted away from the dam and into the watercourse. Preventing future erosion of the dam is a key consideration here. Fewer boulders (rocks greater than 256 millimeters) are encountered as you move downstream from the dam. Smaller clast sizes (a clast is a rock fragment), cobbles and pebbles, predominate. The pebbles provide spawning gravel that the project's designers hope will be used by the reintroduced pure strain Athabasca rainbows.

Another initial task was removing all of the water in Apetowun's upper watershed. Before this dewatering Hatfield, the project partner responsible for restoring the riparian and aquatic habitats, electrofished those reaches. When safety practices for fish and operator alike are followed, electrofishing is a valuable technique for sampling fish populations. The electric current in the water stuns fish in the vicinity of the electrofisher. The stunned fish typically go belly up; they are then quickly netted and put into a large container of freshwater to recover. The fish caught with the backpack electro-





*Tagging an Athabasca Rainbow with a Passive Integrated Transponder*  
PHOTO: © I. URQUHART



*Stream Rebuilding in a Dewatered section of Apetowun Creek*  
PHOTO: © I. URQUHART

fishing gear used by Hatfield staff were then released downstream into natural holding areas that weren't devastated by the wastewater flood.

Before they were released, two steps had to be taken. Since the goal is to establish a pure strain population of Athabasca rainbows, the genetic profiles of the rainbows caught by electrofishing must be established. To this end, the rainbows caught prior to dewatering were tagged with passive integrated responders and their caudal fins were clipped.

The fins were sent for genetic testing at the University of Alberta. In the spring of 2021, with the genetic profiles of the tagged fish in hand, electrofishing will resume in the lower section of the creek. The hope here is that the fish tagged in 2020 will be caught a second time. When tagged

fish are caught again, their genetic profile will be checked. The pure strain Athabasca rainbows will be released above the fish barrier; non-pure strain rainbows will be returned to the creek below the barrier.

### **AWA's 2020 Site Visit**

In the first half of 2020, AWA's Joanna Skrajny did considerable background work in order to prepare for a site visit in the summer. In part, this involved research into the Species at Risk Act Section 73 permit required in order to do the restoration work. It also involved contacting and coordinating with officials from Department of Fisheries and Oceans, Westmoreland Mining, and Hatfield Consultants. In July, Joanna and I visited the mine property. We toured the mine site, observed the stream dewatering/rebuilding work taking place, observed

electrofishing in Apetowun Creek, and observed the tagging, fin clipping, and release of Athabasca rainbows into the lower sections of the creek.

I'm generally skeptical of our species' ability to replicate or improve on long-standing habitats that, through our misadventures, we destroy. But I have to say that I was impressed during our site visit. Hatfield's David Evans and his staff appeared very dedicated to doing the best restoration work possible. Through their redesign and construction work they are certainly trying to mimic what nature itself would recommend as suitable habitat for trout. I'm looking forward to returning to the site next year in order to check on the restoration project's progress. Hopefully, I'll see even more silver in Apetowun Creek than I witnessed this past July. 🐟