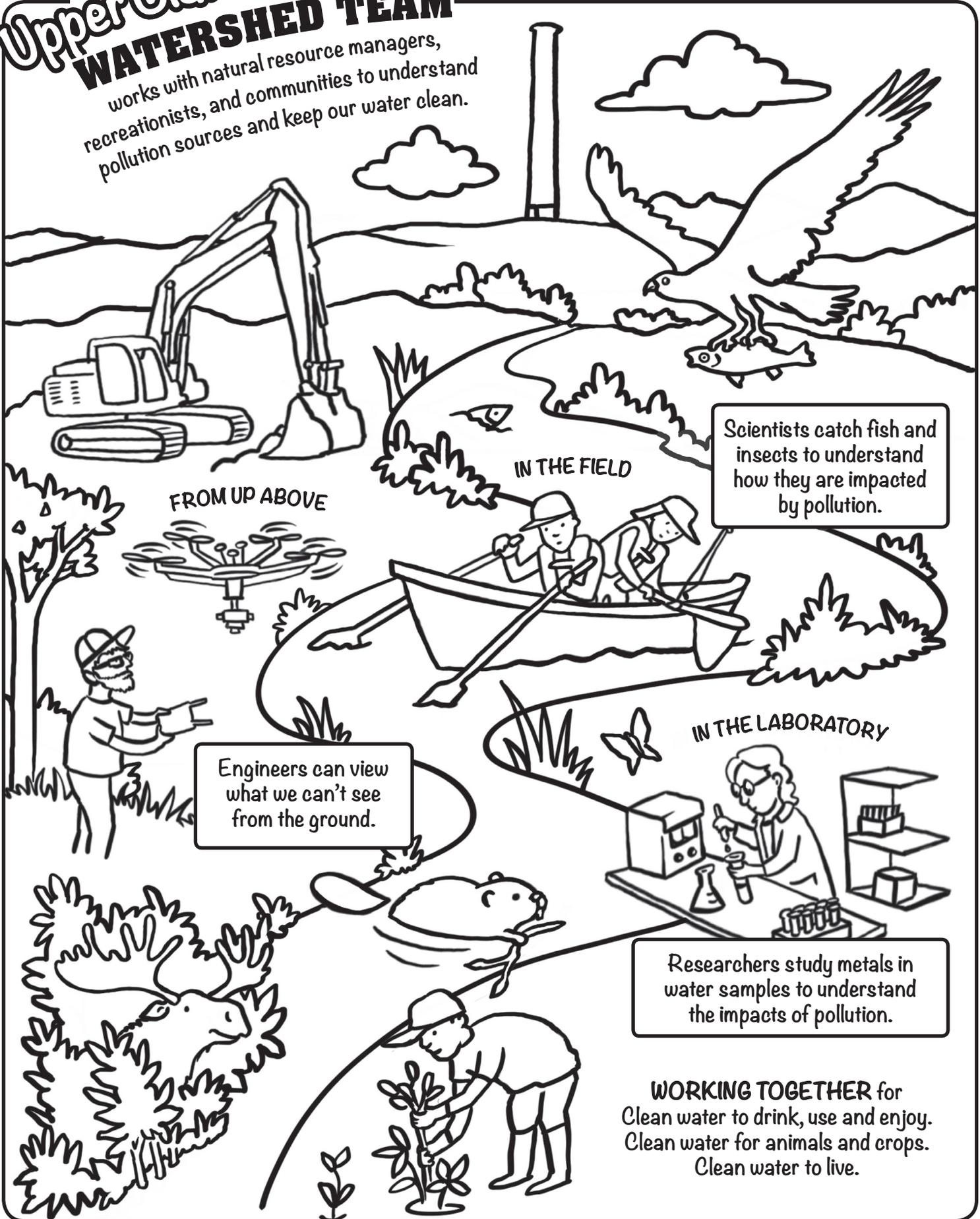


CREWS* Upper Clark Fork River WATERSHED TEAM

works with natural resource managers,
recreationists, and communities to understand
pollution sources and keep our water clean.



MONTANA
NSF EPSCoR



FROM UP ABOVE

IN THE FIELD

Scientists catch fish and insects to understand how they are impacted by pollution.

Engineers can view what we can't see from the ground.

IN THE LABORATORY

Researchers study metals in water samples to understand the impacts of pollution.

WORKING TOGETHER for
Clean water to drink, use and enjoy.
Clean water for animals and crops.
Clean water to live.

*CREWS is the Consortium for Research on Environmental Water Systems

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Water is one of Montana's most valuable natural resources. Whether in rivers, lakes, canals or underground, water is important for our homes, agriculture, businesses, recreation, wildlife and the environment. But water can easily become polluted, and scientists and engineers in Montana are working hard to figure out where pollution comes from and how it gets into rivers and soils. They are also studying how we can keep pollution out of our water or clean it up if it's already there.

One of their research sites is the Upper Clark Fork River in western Montana. The Upper Clark Fork, part of the larger Clark Fork River system, begins outside of Butte and flows to northern Idaho, at which point its waters eventually end up in the Columbia River Basin. The Clark Fork River was historically a major resource for many Native American tribes, and Lewis and Clark explored much of the river too. In fact, the Clark Fork River is named after one of the group's leaders, William Clark. In the 1880s, the area around the Upper Clark Fork became a source of copper mining, with large mining and smelting operations in Butte and Anaconda. Mining continued in the area for nearly another 100 years until ending in the early 1980s.

The Upper Clark Fork is important to the many people, wildlife, and plants that live in and around the river. Ranchers use the river as a water source for livestock, recreationists like to fish and float on it, and animals like trout, osprey, and beavers use the river's habitat for food and shelter. However, due to the area's historic mining and smelting, toxic waste has washed into the Upper Clark Fork River. Many groups and individuals in Montana are now working to help clean up and restore the polluted parts of the river. Scientists and engineers from Montana universities are working with these groups to understand the pollution and inform clean-up efforts.

Because the Upper Clark Fork River is so big, scientists use different tools to help them research different parts of the river. One way that scientists collect information is by flying drones with cameras on them

over the river. The drone can go places that are hard to get to, and they help the scientists observe things that are difficult to see from the ground – like where the river twists and turns, and whether plants or algae are growing in certain places. Even though the drones never actually touch the water, the images they take with special cameras can help us know more about the water in the river and the lands around it. This is called remote sensing.

Not all scientists conduct research with drones though, and some actually use boats to float on the Upper Clark Fork River. These scientists are trying to understand how contamination from mining impacts the larger food webs of the river. Unlike a spider web you can touch and see, a food web represents the interactions and relationships between the plants, animals, and insects in an ecosystem. They are usually drawn as a diagram with arrows showing the connections between species. In the Upper Clark Fork, these food webs stretch all the way from the tiny bugs in the water to the ospreys that catch fish to eat, to even the moose that browse on willows along the river's banks. By looking at the fish and insects, which many other animals rely on for food, scientists can begin to see how different mining wastes move at a microscopic level between animals and plants in and along the Upper Clark Fork River. Scientists that study plants, animals, and ecosystems are called ecologists.

All the scientists and engineers that study the Upper Clark Fork River are part of a team called CREWS – the Consortium for Research on Environmental Water Systems. A consortium is a team, and this team is working together to help our Montana water stay clean and healthy for all to enjoy.

For more information about Montana NSF EPSCoR and research in the Upper Clark Fork River, visit <https://www.mtnsfepscor.org/projects/crews/research/ucfr>

Sources

<https://www.bigskyfishing.com/rivers/southwest-montana/clark-fork/>

<https://www.britannica.com/place/Clark-Fork>



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