Natural Resources of the Rouge Green Corridor

Native flora and fauna indigenous to the Rouge Green Corridor: (left to right) the Black-throated Blue Warbler, Painted Turtle, Red Fox. (Illustrations by Janice Das, Insite Design)

How the Rouge Green Corridor Was Formed

Fourteen thousand years ago, the Ice Age precursor of the Rouge River flowed to the southwest, draining the front of a continental ice sheet and associated glacial ridges. Around 13,800 years ago, the ice melted back and branches of this glacial river system broke across the ridges to the southeast to form the Rouge watershed. For the next 1,500 years, these early branches of the Rouge in Oakland County emptied into a series of vast glacial lakes that were formed by advances and retreats of the glacial ice.

The illustration of the Rouge Green Corridor shows some of the land forms of the modern river valley. Ravines and bluffs were formed when the ancient glacial lake levels dropped. Other land forms, such as the widened segments of the river valley and terraces, were created in response to rising lake levels. Today's river shows a meandering pattern. Some of the loops have been abandoned by the river, creating a distinctive u-shaped land form called an oxbow.

The Workings of a Modern River Corridor

The characteristics and behavior of a river or stream are based on its ancient geologic formation. One factor impacting a river is its *watershed*, or area of land that drains to a water body, often a river or lake. The Rouge River watershed covers 467 square miles of southeast Michigan, home to nearly 1.5 million people including portions of three counties and 48 communities. A watershed is made up of a system of water features, many of which are connected to each other. Wetlands often surround tributaries, accepting flood waters and slowly releasing this water back to the tributary. Lakes are often fed by streams or groundwater in the form of springs. They are also drained by streams. Watersheds are an interrelated system, so changing one part of the system impacts the other parts.

The Way it Was…

Before the land in the watershed was transformed by human development, rivers and streams received most of their water from groundwater. When it rained, the water was first intercepted by trees and vegetation. If it rained hard enough, excess water soaked into the ground, making it available to the plants. A relatively small amount of rain that hit hard surfaces, such as rocks or clay soils, became *surface flow* or *runoff* and ran directly into low areas like wetlands or tributaries. Any excess water in the soil was filtered by the soil particles as it worked its way to the groundwater, where underground connections directed it to streams and rivers. So, before European settlement, the streams received a slow constant flow of clean, cold water from groundwater and spring-fed lakes, even during dry spells. Because these conditions lasted over thousands and thousands of years, aquatic plants and animals became adapted to them.

The Way it is Today…

In general, water pollution is considered to come from two sources: "point sources" are readily-identifiable sources, such as an industry discharge pipe. "Non-point sources" are sources of pollutants that are not easily identifiable, such as those carried by stormwater runoff. Non-point source water pollution is created when rain falls to the ground on an impervious surface (roof or parking lot), and picks up pollutants (sediment, oil, motor fluids, fertilizers, etc.) as it travels along the surface on its way to a lake or river. The biggest source of water pollution today is stormwater runoff.

As the land was cleared for agriculture, and then later for homes, businesses, roads, and parking areas, a good deal of the porous soils were covered up by

impermeable surfaces, or hard surfaces that water can't penetrate. Instead of soaking into the ground, much of the water became surface flow or runoff. We quickly learned to collect runoff in pipes, efficiently taking it away to a wetland or river. This approach keeps our homes and roads from flooding, but it also sends torrents of rainwater (or what we call today *stormwater*) to our water bodies. Instead of a slow, constant flow of cold, clean water, our rivers receive high volumes of water over a short period of time – or *flashy flows*. As the water moves over hard surfaces, it picks up pollutants from cars or chemicals spread on the grass. Pavement in the summer also heats the water, making it unsuitable for certain aquatic species. The force of large volumes of stormwater piped directly to streams scours and erodes the banks of the stream, dislodging bank vegetation and degrading wildlife habitat.

The Rouge Green Corridor has not been as impacted by urbanization as some other stretches of the Rouge. The main reason for this is that the existing vegetation along the river corridor was left in place as the area developed.

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The Plant-River Partnership…

"Native" plants are plants that grew in the Rouge Green Corridor before European settlement. They have survived here for thousands of years and are uniquely adapted to the climate, soil, and water conditions of this area. Wildlife indigenous to this area has co-evolved with native plants, depending on these specific plant species for their survival. A "non-native" plant is one that was brought to this area by European settlers, and later by plant and garden enthusiasts. Many of these species don't cause any problems. But some, called "exotic invasive plants," escape into the wild, taking over natural areas and out-competing the native plants. The most common invasive plants in the Rouge Green Corridor are common buckthorn (*Rhamnus cathartica*) and garlic mustard (*Alliaria petiolata*). These invasive plants rob wildlife of the food and habitat benefits of the native plants they depend on.

Areas where land and water meet are often rich in plant and wildlife diversity. The woodlands that grow next to the Rouge play a significant role in protecting the river. Plant roots hold the stream bank in place and help limit soil erosion. Leaves that fall into the water provide food and shelter for aquatic organisms.

(See "Choose Earth Friendly Landscaping" in the River Stewardship chart for more details on yard waste in streams.) Branches and trunks that fall across the water provide loafing logs for ducks and turtles. Finally, large trees and shrubs growing near the water's edge shade the water, keeping it cool and hospitable for all the aquatic creatures. Plants along the river act as a *riparian buffer*. The wider this buffer is, the more it can do to protect the river from problems associated with stormwater runoff from parking lots, rooftops, and lawns. The stems and fallen leaves of plants growing in the riparian buffer help to slow runoff of rainwater, giving it more time to infiltrate into the ground. This infiltration filters the runoff of pollutants (sediments, oils and grease from cars, or fertilizer from lawns) that stormwater may be carrying from upland areas, resulting in cleaner water delivered to the river.

Riparian buffers that contain *native plants* have added ecological value because they are critical sources of food, shelter, and nesting material for wildlife. (See Sidebar) Native plants still have a strong presence in the Rouge Green Corridor as was documented during a plant inventory by botanists in 2004. The natural areas inventoried along the corridor vary widely in size and condition. Larger, undisturbed sites have high-quality native plant communities, including species such as American beech, sugar maple, bitternut hickory, red oak, ironwood, trillium, and jack-in-the pulpit.

An Ark of Biodiversity…

Many terrestrial (lives on land) and aquatic (lives in water) wildlife call the Rouge Green Corridor home. In fact, the Rouge Green Corridor is considered a refuge or ark for future re-colonization of the rest of the Main Branch of the Rouge River. There are two reasons for this: 1) There is a fairly intact vegetated riparian buffer that provides important protection for the aquatic community; and 2) The water is of fairly high quality, with high dissolved oxygen concentrations and low to moderate nutrient concentrations (which is also due to the riparian buffer). Continued improvements in water quality, and the restoration of riparian buffers will help enable the diverse array of plant and animal species found within the Rouge Green Corridor to re-colonize other areas along the Rouge River.

Recent inventories of the Corridor by biologists show that the river and its adjacent wooded uplands support five kinds of turtles, two kinds of non-poisonous snakes, eight species of frogs, and seventeen species of mammals.

Some examples include painted and wood turtles, black racer, eastern gray tree frog and green frog, red fox, mink, and white-tailed deer. Between 38 and 99 different bird species including many species of migrant warblers, raptors such as the sharp-shinned hawk and Cooper's hawk, owls, woodpeckers, and many other birds have been identified in the Corridor. Aquatic invertebrates or macroinvertebrates found within the Rouge Green Corridor include flathead and small minnow mayflies, net spinner caddisflies, and several types of beetles. Another exciting find is that the Corridor has the largest and most diverse population of freshwater mussels within the entire Rouge River watershed. Several of the species found include the fluted shell, white heelsplitter, and squawfoot-mussel. Fish in the Rouge Green Corridor include several types of minnows, sunfish, and perch as well as sensitive species such as rock bass, Johnny darter, and stonecat.

Urbanization and Water Quality

Over the years, the Rouge Green Corridor has been impacted by the stresses of urbanization. As land use shifted from agriculture to suburban and urban development, the Corridor was used for combined and sanitary sewer overflows, limited industrial discharges, and stormwater discharge. These uses caused problems, such as odors, non-point source water pollution (See sidebar) and high flow variability. Flashy flows are discussed further on the front of this poster under the heading *The Way it is Today…* In 1992, the Rouge River National Wet Weather Demonstration Project ("Rouge Project"), funded by the U.S. Environmental Protection Agency, began to address the causes of these issues, and implement solutions. As part of this project, a monitoring program was begun to assess current conditions, identify primary pollutant sources, and track long-term trends.