

This article appeared in the March/April, 2004 edition of the Wild Ones Journal.

Connecting to the Future...Corridors for a Healthier Environment

By Sally Elmiger

This is the first article in a series that discusses how corridors that connect natural areas can help sustain our environment, native plants, and local wildlife – and how Wild Ones can start creating them in their own communities.

“The thigh bone’s connected to the backbone...the backbone’s connected to the neck bone...the neck bone’s connected to the head bone...” *An African-American spiritual.*

Corny, maybe but when you stop to think about it, everything that lives and moves on this earth is connected in some way or other to everything else. As most gardeners know, we have a physical, psychological, and often emotional connection to our plants; the plants have a physical connection to the soil; the soil is home to myriad microorganisms; and the microorganisms live on the detritus from the plants that live in the soil that grow (at least in our gardens) with TLC from the gardener. The connections are often not linear, but a traditional garden would not grow and look like it does without all of these connections.

The natural world is also governed through connections. Ecosystems, such as forests or wetlands, are defined by the interactions (or connections) of the living organisms (plants and animals) to their non-living physical environment of atmosphere and soil. Ultimately, the plants and animals work on the non-living things for so long that they change the non-living things. In the same vein, as the non-living elements change, the plants and animals adapt to better take advantage of their changing environment. Other examples of ecosystems are grassland communities like prairies, surface water bodies like lakes and ponds, and river or stream systems.

Broken Connections

Over the past 50 years, developing communities have not, in general, taken into consideration the connections that exist between different ecosystems across the landscape. The building of homes and parking lots changes the way water runs over the land, often disconnecting wetlands from the uplands that provide storm water runoff – the life support of wetlands. Similarly, woodlands are cut apart by clearing large areas of trees for development. This can leave “patches” of plant and animal habitats across our community, a trend often referred to as “fragmentation.”

Need for Multiple Ecosystems

Like our native plants, wildlife has evolved with the environment to create a co-dependent system – an ecosystem. If the wildlife doesn’t get what it needs from its immediate surroundings, it has to look for it elsewhere. Many species of wildlife require more than one ecosystem type to survive. For example, frogs need water to reproduce, but they live much of the year in upland areas. Other animals are forced out of their birthplace to ensure that there are enough resources for the parents. However, human

changes to the landscape can make this transition more difficult. It may force a species through areas that expose it to predators and other dangers such as roads, areas where there is no food or water – or the creatures may be lost and not be able to find another suitable area in which to live. Fragmented landscapes also make it more difficult for plants to reproduce. The more difficult it is for pollinators to reach a certain plant species, the less the plant's chances are of thriving. The smaller number of plants available for interbreeding, the more limited the genetic diversity and ultimate survivability of a stand.

Effects of Fragmentation

If the spaces between the patches or fragments of remaining ecosystem are too large or dangerous to cross, that species may disappear from that patch because they can't reproduce, or there isn't enough food or space to sustain future generations. And then that species' various impacts on the patch is lost and the biodiversity of the patch is diminished.

Habitat Corridors

Habitat corridors solve many of these problems by providing a link from one ecosystem to another, providing a relatively safe travel route for movement. This essentially expands the habitat to any areas that the patch is connected to. One definition of corridors is, "Avenues along which wide-ranging animals can travel, plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters, and threatened species can be replenished from other areas." Corridors can be composed of many things – from riverbanks to old railroad beds. They can be used just for natural area preservation, or as a conduit for people, providing connections from town to town, and possibly across regions and states.

What's Next

This article sets the stage for the importance of corridors, and how our environment and the survival of the native plants we cherish can be enhanced and sustained by protecting and creating connections between natural areas. The next article will concentrate on the different types of corridors that can serve nature and people, while the third article will talk about communities that have discovered the benefits of planning for, and creating corridors within their boundaries, and beyond.

Sally Elmiger has a graduate degree in Landscape Architecture from the School of Natural Resources at the University of Michigan and works as a community and environmental planner for Carlisle/Wortman Associates, Inc., in Ann Arbor, Michigan. She is a member of the Ann Arbor (MI) Wild Ones Chapter.

References:

Michigan Trees; Barnes, Burton V., Wagner, Warren H., Jr.; University of Michigan Press; Ann Arbor, Michigan; 1996.

American Wild Lands website: www.wildlands.org.

Side Bar:

Biological Diversity – Biodiversity

The variety of life forms that inhabit a given area. Biodiversity involves habitat diversity, plant and animal species diversity within the various habitats, and the genetic diversity of the individual species.

Ecosystem

A term coined by the British ecologist A.G. Tansley to refer to a community of interdependent organisms and the physical environment they inhabit. Although there is no accepted ecosystems hierarchy, the ecosystem concept can be applied to a variety of scales, from the microscopic, to the whole Earth. The individual organisms interact with each other and with their environment in a series of relationships made possible by the flow of matter and energy within and through the system. The relationships are dynamic and routinely respond to change without altering the basic characteristics of the ecosystem. This remains true unless a major environmental disruption (like invasion by alien species, and human interference) takes place.

The Environment Dictionary. David Kemp. Routledge Press. London. 1998.

This article appeared in the May/June, 2004 edition of the Wild Ones Journal.

Connecting to the Future...Corridors for a Healthier Environment

By Sally Elmiger

This is the second article in a series that discusses how corridors connecting natural areas can help sustain our environment, native plants, and local wildlife, and how Wild Ones members can start creating them in their own communities.

So, after reading the first article on corridors, did you rush out to see if your community's natural spaces were "fragmented"? Did you see a bit of woodland down the street, or a wetland at the back of your neighbor's yard? Or did you see open spaces linked by stream channels, naturalized utility routes, and rail-to-trail bikeways? If you saw the latter, you needn't read any further. However, for those that didn't, this article describes the types of potential corridor opportunities for your community – the many elements in our everyday landscapes that can be used by plants and animals (and people too!) to move from one green place to another, and live life in between.

A Review

Definition of a corridor: "...avenues along which wide-ranging animals can travel, plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters, and threatened species can be replenished from other areas."

Before looking at different types of corridors, let's briefly review why these links are important. The natural world functions on an "ecosystem" level, or combinations of landscape elements that all work together. When one landscape element is disconnected from another, it forms a "patch" or relatively small area with limited habitat variety. Many patches are formed by human development, which isolates landscape elements from each other. Small, isolated patches of plants and animals don't have the genetic diversity to adapt to changes in their environment, or a new threat or disease.

This is an example of "fragmentation." Fragmentation not only changes the way our landscapes look, it changes the way our landscapes function. And the more fragmented our natural areas become, the more difficult it is for plants and animals to survive. If we have fragmented landscapes, we need to create links between them. These links expand the available habitat by providing a relatively safe travel route, increased opportunity for genetic interchange, and a place to go if a species' current living quarters no longer meet its needs.

Sidebar:

How do Corridors Help Native Plants?

This article sounds like it's more about wild "life" than wild "plants"! Well, the lesson here is – if we help wildlife to move from natural area to natural area, we will also help the wild plants do the same. A study undertaken by researchers at the University of

Florida showed that more birds were flying between natural areas that had a connection, than between natural areas that weren't connected. Birds eat berries, and are important dispersal agents for the seeds in the berries. In a similar study by the same group, it was shown that plants were more consistently pollinated between connected natural areas than unconnected ones. This means that the butterflies and bee pollinators could make it safely from one area to the other through the connecting corridor.

Natural Corridors

In many developed and developing communities, there are two types of naturally occurring corridors – a river or stream corridor, and a tree line or hedgerow corridor. While both corridor systems are complex in structure and function, we'll describe them here in general terms just to understand their basic characteristics.

The “riparian” corridor is a water route dominated by a river, stream, or other linear water feature. The river or stream is also usually vegetated on both banks by flood plain and then upland vegetation. Riparian corridors are often left undeveloped, and therefore provide an opportunity to act as a link between natural areas. Because water, rich floodplains and uplands are all part of riparian corridors, they provide a great diversity of habitats. Diverse growing conditions support a large variety of plant species. Plant diversity also promotes animal diversity through varied food sources and nesting sites. In addition, the availability of water and upland areas allow many wildlife species to carry out their full life cycle within the riparian corridor.

The vegetation along streams and rivers also provides significant benefits to the fish, animals, and organisms that live in the streams. A major threat to water quality is sediments and pollutants that are washed off surfaces such as parking lots and lawns (fertilizers/pesticides) and into streams. But if the storm water must first cross a vegetated “buffer,” then the stems and detritus from the plants helps to slow the water down, allowing the water to infiltrate the soil and be taken up by the plants. The slowing of the water also allows sediments to settle out before reaching the stream. Trees and shrubs along a stream also contribute organic material to the water, such as leaves and logs or branches. The leaves tend to biodegrade in the water, providing food for aquatic organisms. The logs and branches provide habitat structure for spawning fish, and loafing turtles and ducks to name a few. The streamside vegetation also shades the water and keeps it cool for fish and other aquatic inhabitants. Lastly, the roots of the plants keep the banks of the stream in place, providing erosion protection and minimizing sediment in the streambed. So, the riparian corridor not only provides a link for moving wildlife safely from one green space to another, it also protects the water quality within the stream itself.

Tree rows, or sometimes known as hedgerows, also provide an opportunity for wildlife and plant migration. These landscape elements are often narrow rows of trees, shrubs, and herbaceous plants that are in place to separate properties, or farm fields in agricultural areas. Tree rows can be made up of native or non-native plant species, depending on the amount of past disturbance. If native vegetation exists, the tree row can

be an important source of seed in a highly disturbed landscape. Tree rows can be continuous, or can provide “stepping stones” from one large habitat area to another. The Michigan Department of Natural Resources reports that a patchy tree row with trees and shrubs can attract up to 38 different bird species, and a similar but continuous tree row can attract up to 48 different bird species. Many communities strive to retain tree rows as important landscape elements when farm properties are developed.

Human Corridors

As you can imagine, there are many types of corridors that are the result of human development and technology – roadways, railroads, utility line corridors, canals, and trails to name a few. Unlike natural corridors, the main purpose of human corridors is to move people from place to place. However, conservation of the natural landscapes on both sides of these corridors can also provide significant – and in some places the only – connections between patches of nature. In this article, we’ll focus on two of these corridors: the abandoned railroad right-of-way, and the utility line corridors.

At the height of railroad transportation, there were almost 300,000 miles of rail lines. Today, this form of transport is gradually being replaced with the automobile and truck. When the trend in transportation shifted, and rail lines become obsolete, people started transforming the lines into “rail-trails.” As of 2002, more than 11,600 miles of rail line are being used as bikeways, hiking and horse trails, and in-line skating routes.

But rail-trails have more to offer than just places for human transportation and recreation. In the Midwest, many railroad lines traversed fire-dependent plant communities, such as prairies and oak openings. The sparks from the rail cars often started fires next to the tracks, which in turn, sustained the plants within the railway corridor. Remnants of these communities exist today next to abandoned rail lines, providing native food sources and habitat for wildlife, as well as native seed for dispersal.

Utility line right-of-ways are another opportunity to enhance or create wildlife corridors. In most cases, utility companies trim trees and mow the ground layer of a utility easement so that the lines are easily accessible for repair and not affected by vegetation. This maintenance can be expensive. Creative partnerships have been made between concerned organizations to assist the utility companies in maintaining their easements, but in a much more wildlife-friendly manner.

For instance, an alliance between the National Wild Turkey Foundation, the U.S. Forest Service, Outward Bound, and the east-coast energy company of Haywood EMC was formed to enhance habitat for wild turkey in utility easements on U.S. Forest Service parklands. This project was centered in North and South Carolina, and Georgia. The group worked together to identify six sites where permanent grass and forb wildlife openings were established and are now being managed to benefit wild turkeys, as well as other wildlife species.

What's Next

Now that you know which landscape features constitute a corridor, check out your community to see how your natural areas are linked. If your town or city has some work to do, the next article in this series will talk about several successful corridor projects that extend habitat areas, promote non-motorized transportation and offer recreation, all through the same linear routes. These popular amenities are called “greenways,” and are growing in popularity and miles.

Sally Elmiger has a graduate degree in Landscape Architecture from the School of Natural Resources at the University of Michigan and works as a community and environmental planner for Carlisle/Wortman Associates, Inc., in Ann Arbor, Michigan. She is a member of the Ann Arbor (MI) Wild Ones Chapter.

References:

Ecology of Greenways. Design and Function of Linear Conservation Areas; Smith, Daniel S., Hellmund, Paul Cawood, eds.; University of Minnesota Press; Minneapolis, Minnesota; 1993.

American Wild Lands website: www.wildlands.org.

Power Lines; Haywood Electric Membership Corp.; Waynesville, North Carolina; December, 2003.

Rail-Trails and Safe Communities; Tracy, Tammy and Morris, Hugh; Rails-to-Trails Conservancy; Washington D.C.; 1998.

Michigan Department of Natural Resources website: www.michigandnr.com

University of Florida News and Public Affairs website: www.napa.ufl.edu

This article will appear in the July/August, 2004 Wild Ones Journal. For more information about Wild Ones, visit the following website: www.for-wild.org.

Connecting to the Future...Corridors for a Healthier Environment

This is the third article in a series that discusses how corridors that connect natural areas can help sustain our environment, native plant communities, and local wildlife. At this point, our readers are surely seeing the benefits, and possibilities for greenways in their own communities.

In the first two articles greenways were described as vegetated corridors connecting a series of natural areas. These corridors can be used for recreation and simultaneously to protect native plant and wildlife habitats-- among other benefits.

Greenways happen when residents and community leaders work together for the common purpose of natural area preservation.

A Linear Park - The Paint Creek Trail, Oakland County, Michigan

The Paint Creek Trail's beginnings go back to the 1800s, when a railroad was constructed on the route by the Detroit and Bay City Railroad. Running for 10.5 miles from the Village of Lake Orion to the Oakland/Macomb County line in southeast Michigan, the Paint Creek Trail follows the abandoned railroad right-of-way that was once the route of the Penn Central Railroad. The railroad's property was purchased in 1982, with assistance from a grant through the Michigan Natural Resources Trust Fund, by the Paint Creek Trailways Commission, which was formed specifically for the purpose of maintaining the Trail. The Commission is an intergovernmental entity made up of two commissioners from each community through which the trail runs: Orion and Oakland Townships, and the cities of Rochester Hills and Rochester. The main purpose of the acquisition was to provide a recreational trail for non-motorized activities, such as cycling, jogging, walking, and horseback riding. But as the trail gained in popularity, the Trailways Commission realized that the trail provides many other benefits. For example, trail users have many opportunities for viewing wildlife, such as painted turtles sunning themselves on logs in the wetlands or a large snapping turtle crossing the trail, finches as they dart from plant to plant or bluebirds that nest in trees or nest boxes, and monarch butterflies feeding on the numerous milkweed plants.

The trail right-of-way is typically 100 feet wide, although the trail limestone surface itself is only 10 feet wide. Most of the remaining space in the right-of-way is filled with a variety of wetland, woodland and grassland habitats, that harbor native plants and seed banks from the time when the railroad ran.

Also flowing through the right-of-way is Paint Creek, a designated trout stream set in a suburban background. Because of the relationship of the creek to the trail, there are many areas of land between the creek and the trail that were not easily accessible, and therefore left undeveloped. Even though the trailway and its adjacent habitats contain many native species, they still require maintenance to preserve them.

For example, due to the linear nature of the trailway corridor, there is a greater amount of “edge” area that invasive plants can penetrate. Oakland Township has devoted significant funds, staff time and volunteer hours to removing invasive species from the trail edge. One unexpected benefit of fewer invasives (like honeysuckle (*Lonicera* spp.), buckthorn (*Rhamnus* spp.) and autumn olive (*Eleagnus umbellata*)), which grow faster than many native shrubs, is that pruning for safety is required less often along the trail; this reduces trail maintenance expenses. Of course, the other benefit is that the additional space provides greater opportunities for native plants to re-establish themselves.

The prolific native plant seed source has, with appropriate management activities, produced some exciting results. A few years ago, it was evident that a tall-grass prairie remnant existed next to the trail right-of-way in Oakland Township. The Trailways Commission acquired the three-acre piece and hired an ecologist to conduct a plant inventory and develop a management plan.

The Director of Parks and Recreation for Oakland Township, Mindy Milos-Dale, (a Wild Ones member, Oakland Chapter), has been heading up the management of the prairie, and explains what they've done so far: "We're in our second full year of management, and we're still discovering what's in the seed bank. We haven't been doing this long enough to know what's out there. We've conducted prescribed burns, and we are inventorying the plants that appear, including those in the deer exclosures, which a local Boy Scout troop built for us.

These exclosures are necessary since the large deer population in our area eats many plants before they can be inventoried. The exclosures are built with metal posts and chain-link fencing. We recognized that prescribed burns would be necessary in the management of this area and that wood fencing would not meet our needs. The dimensions (10' X 30') of the exclosures were based on research done by Michigan State University. The research showed that deer rarely enter narrow exclosures. ('Narrow' being defined by the breadth of a deer's fence-crossing leap.) An extension of the logic of these findings suggested that we could go with 5' fencing. In the two years that the exclosures have existed we have seen no evidence that deer have entered them.

By following the management plan, which, to provide adequate sun exposure to the prairie species, includes the removal of invasive and woody species in the prairie, we've seen a transformation in the native prairie plant community. Last

year we recorded a blanket of lupine in the deer exclosures. It looked just like what we had seen in old photographs of the area."

Recently Oakland Township acquired and started managing another prairie--a wet prairie--that is on a 10-acre parcel adjacent to the railway. This site has an unusual mix of plants because the soil is calcareous and sandy, while the water table is high. The species list includes *Potentilla fruticosa*, *Liatris aspera*, *Tofieldia glutinosa*, *Parnassia glauca*, *Gentian procera* and *Andropogon scoparius*.

Access to these sites has generated some discussion. Milos-Dale explains, "Some people feel that if a property is bought with public money, all of it should be accessible through the building of trails and other support facilities on that property. However, one of the purposes of acquiring these parcels is to preserve the native plant and animal communities. We reason that the small population sizes of the native species would not fare well with a lot of disturbance. If a feature can be seen from the main trail, we feel that in some delicate places, side trails and other public facilities are not necessary. "

The Paint Creek Trail is an example of cooperation...cooperation among adjoining communities, cooperation between the communities and the residents who own land along the trail's right-of-way, and cooperation among the various community maintenance departments and resident volunteers who help maintain the trail and its environmental integrity.

What's Next

The next issue of the Journal will feature the final installment in this series—an example of a greenway that is less traditional in nature, but that also represents a cooperative relationship--cooperation between a community and the developers building in that community.

Sally Elmiger has a graduate degree in Landscape Architecture from the School of Natural Resources at the University of Michigan and works as a community and environmental planner for Carlisle/Wortman Associates, Inc., in Ann Arbor, Michigan. She is a member of the Ann Arbor (MI) Wild Ones Chapter.

References:

Paint Creek Trail website: www.paintcreektrail.org

Oakland Township, Michigan, website: www.oaklandtownship.org