

WFA BRIEFING P A P E R S



This Wild Farm Alliance Briefing Paper is part of a series that explores many of the issues that define and distinguish the concept of farming with the wild.

Each paper focuses on a particular issue set in the context of reconnecting food systems with ecosystems. We are striving to bridge the gap between stewardship farming and wildlands conservation. To obtain other papers in this series, or to learn more about our programs, contact the Wild Farm Alliance.

WILD FARM ALLIANCE

406 Main St., Ste. 213
Watsonville, CA 95076
831-761-8408
831-761-8103 fax

wildfarms@earthlink.net
www.wildfarmalliance.org

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Making Connections for Nature: The Conservation Value of Farming with the Wild

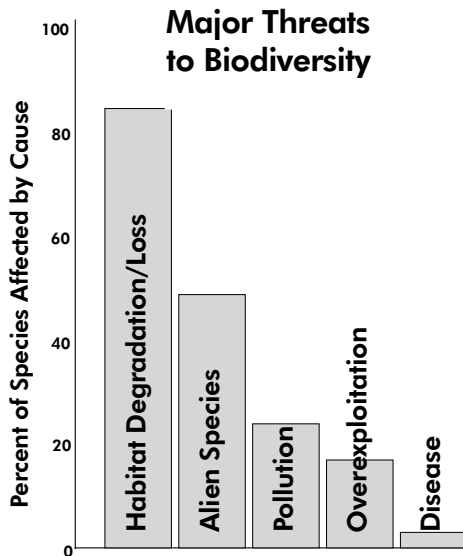
The natural landscape is a highly complex tapestry of life. As this tapestry becomes increasingly fragmented by development, resource extraction, and other human activities, the ecological fabric of the landscape effectively unravels. Over the past century, wildlife species have undergone dramatic declines throughout the U.S.—a crisis largely driven by the destruction of native habitat. Clean water, which once flowed freely through the land and nurtured its inhabitants, has become an endangered resource in many parts of the country. Ecological processes, such as nutrient cycling, predation, pollination, and fire, are unable to function properly in a fractured landscape.

With agriculture occupying roughly two-thirds of the U.S. land area, farming with the wild can play a critical role in making Nature whole again. Through wildlife corridors, protected waterways, and other natural linkages, wildlife-friendly farms and ranches can help reconnect the landscape and restore its ecological integrity.

Habitat Fragmentation: Life on the Edge

Agricultural expansion is the primary cause of habitat loss and fragmentation in the lower 48 states. When forests or grasslands are converted to agriculture, many native plants and animals are displaced. A decrease in natural habitat translates to fewer resources for the species depending on it for their life needs. Further, natural habitats broken up into ever smaller fragments become isolated from one another like islands in an inhospitable sea of altered land. This scenario is problematic for animals needing to move freely across the landscape for food and water, as they may not be able to travel effectively between habitat islands. Species requiring big, wild space to roam and reproduce are at especially high risk in fragmented landscapes—for example, wolves are often killed by people when they disperse from protected areas into the surrounding countryside.

If an animal or plant population becomes too small and isolated, it may vanish altogether. Once a population has disappeared from a habitat “island,” this island might not be recolonized by other members of the same species—many forest interior birds, mammals, amphibians, and insects refrain from crossing open areas to avoid risk of predation or hostile microclimates. Habitat fragmentation also affects the natural movements of seeds, spores, and pollen of plants, along with nutrient and energy flows in the landscape. Some species are able to persist or even thrive in altered and fragmented habitat—popular game species like white-tailed deer and wild turkey are good



Habitat loss is the greatest threat to imperiled and federally listed species, followed by alien species (after Stein, Kutner, and Adams, 2000).



Wildlife linkages provide predators such as this bobcat room to move across the landscape.

examples. The increase in populations of these species, however, comes hand in hand with the loss of many others. Geometrically speaking, small patches of forest have relatively more “edge” and less interior habitat than large patches. This scenario is ecologically meaningful because the physical environment near the edge differs from that of the forest interior; typically, the microclimate of edge habitat is windier, drier and brighter than that of the forest interior. Such conditions may not be conducive to the survival of certain native species—imagine a humidity-sensitive salamander or a shade-loving wildflower trying to survive along the sunny border of a hayfield.

Species associated with edge habitat are often “exotics,” or species living outside of their native range. Exotic species, such as bush honeysuckles, Norway rats, and European starlings, along with opportunistic native species that thrive in human dominated landscapes (e.g., raccoons, skunks, brown-headed cowbirds), can outcompete or otherwise harm native species. Habitat edges can also serve as an invasion venue for “pest” species; for instance, native forest interior birds nesting near forest edges suffer very high levels of nest parasitism by brown-headed cowbirds, which lay their eggs in the nests of other birds. Lastly, edge habitat inevitably brings wild species into contact with domesticated species, potentially precipitating the transfer of diseases between them.

Thinking Big for Biodiversity

Large areas of wild habitat are essential for protecting the diversity of life. National parks, federally designated wilderness, state parks, and privately held nature reserves are good examples of places where the conservation of biodiversity and wilderness are given highest priority. In addition to having great ecological value, such wild sanctuaries provide us with aesthetic, recreational, spiritual, and economic benefits. They also serve as “living laboratories” relatively free of human influence, and can thus function as controls or references for scientific study.

But only a small fraction of the land in the continental U.S. is strictly protected for biodiversity, with roughly 5% preserved as wilderness. These wild vestiges alone are insufficient for maintaining Nature’s diversity. Indeed, the vast majority of U.S. endangered species inhabit private lands, which can and must serve to complement public lands in protecting wildlife and habitat. With agriculture implicated in the decline of roughly 40% of endangered species, farms and ranches are essential resources to conservation efforts aimed at reducing fragmentation by restoring and reconnecting natural habitat.

In order to diminish the profound effects of habitat fragmentation on wild species and ecological processes, habitat connections must be made at many scales and in myriad forms. Hedgerows and windbreaks, for example, can connect and provide small patches of habitat for insects, birds, and other animals with minimal area requirements, while larger scale wildlife corridors or linkages are necessary to reconnect woodlands and wetlands across the landscape. Farmers and ranchers can work with adjoining landowners to further efforts toward re-establishing habitat connectivity. These efforts should seek to

minimize habitat edge and maximize interior habitat. In urban and intensive agricultural landscapes, even narrow wildlife linkages may be essential in linking populations that would otherwise be isolated from one another. Ultimately, a wildlife linkage should be designed according to the needs of the species it is intended to accommodate. As a general rule, a wide wildlife linkage is better than a narrow one; a continuous connection is better than a fragmented linkage; and two or more linkages between fragmented wildlands are better than one.

Given the vital role of water in maintaining and transporting life, it is not surprising that riparian areas can serve as essential natural corridors for wildlife movement. In upland areas, riparian corridors provide habitat connections between highlands and the surrounding lowlands. A multitude of wildlife species depend on the resources afforded by rivers and streams—especially in arid climates. Linking large sections of riparian and associated upland habitat can also help facilitate the restoration of key predators, such as wolves, coyotes, bears, and cougars. These and other top predators help regulate populations of prey species (e.g., white-tailed deer), and may directly and indirectly impact populations of smaller predators—which can decimate smaller prey if left unchecked. For example, one study in California documented more species of songbirds in canyons with coyotes than in canyons without coyotes. When coyotes were absent, “mesopredators” such as opossums, foxes, and house cats preyed heavily on songbirds and native rodents.

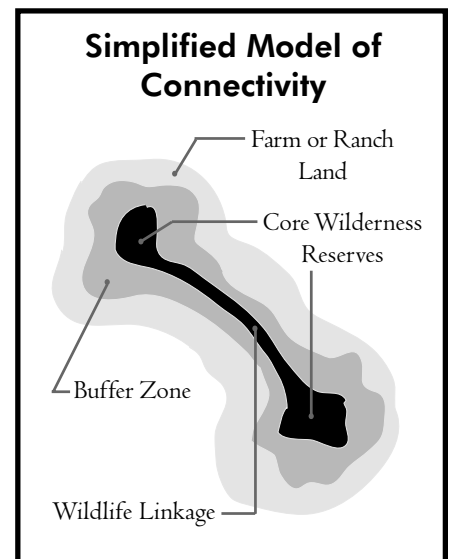
Large carnivores and other wide-ranging species require regional and inter-regional wildlife linkages connecting cores of wild habitat that would otherwise be isolated. Grizzly bears, for instance, travel very long distances when they disperse from their place of origin in search of a new territory. Of course, agricultural lands are not sufficient habitat for grizzlies—they need huge swaths of wilderness to survive—but ranchers and farmers can make their land more hospitable to such carnivores by adopting nonlethal methods of predator control. Likewise, migratory birds can be accommodated in their transcontinental journeys by protecting wetlands and other “stepping stones” of habitat to support them during their stopovers.

In addition to protecting native biodiversity, wildlife linkages and adjacent wildlands provide many ecological services that benefit agriculture. Agroforestry, pasture, and field and row crops near wild habitat profit from the presence and dependability of pollinators and from the many birds and bats that nest or roost there—consuming thousands of pest insects that could otherwise cause damage. Improved pollination can increase crop quality, while reduction of insect pests increases crop yields. Birds can also reduce insect harassment of livestock, thus lessening stress and improving the health of the animals. Vegetated riparian corridors alongside streams and rivers—especially when continuous—increase both surface and subsurface water quality. Since vegetation can attract insect pests, care should be taken in selecting plant species that do not serve as hosts. The richness of species and vibrant quality of riparian corridors can transfer into agritourism dollars and higher property values.



(c) Cheryl B. Schulz

Twenty-five species of pollinating butterflies and moths are listed as threatened or endangered in the United States, such as the above Fender Blue butterfly.



Core Wilderness Reserves are managed specifically for wildlife species diversity. Buffer Zones are managed for desirable edge species, and Wildlife Linkages are managed as habitat and for species migration and dispersal (after Adams and Dove, 1989)

Split Rock Wildway*



D. Imhoff



D. Imhoff

New York's Adirondack-Boquet-Champlain Valley, or the *Adirondack Coast* of Lake Champlain, is home to an ambitious effort to make farming compatible with the full range of biological diversity. For the past decade, conservationists in the eastern Adirondacks have been working to protect Split Rock Wildway, a wildlife corridor linking Lake Champlain and its valley with the Adirondack mountains to the west.

To date, nearly 7,000 acres have been protected, primarily through state or private land acquisition in the area. Much of this land is forest and will be awarded Forever Wild protection—thus maintaining the land in a wild state for perpetuity. Black Kettle Farm is situated on approximately 200 acres of this wildway. Some of the agricultural fields will be allowed to return to forest in order to broaden and strengthen the Split Rock Wildway, while others will be diversified to help meet the needs of the local human community—as well as of native pollinators, grassland birds, raptors, and small mammals. Fields dedicated to agriculture will be set in a matrix of wild forest, and will be criss-crossed by broad hedgerows, or hedgethickets, comprising native early succession and fruit-bearing tree and shrub species. A diversity of fruits, vegetables, herbs, mushrooms, grains, and fibers will be produced—all organically, and all for local and regional consumption.

For information or to volunteer at Black Kettle Farm, please write the Eddy Foundation, POB 42, Essex, NY 12939.

*Conservation efforts in the Split Rock Wildway are spearheaded by WFA's steering committee members John Davis, Jamie Phillips, and Mike DiNunzio.

Supporting Habitat Connectivity

Farmers and ranchers who produce sustainable food and fiber will endure and prosper when supported by community members who are willing to make efforts such as those outlined below.



Community Strategies

- ❖ **Bridge Building** between conservationists, farmers, ranchers, and consumers in each community can be initiated by assessing and then discussing opportunities for collaborative conservation.
- ❖ **Wildlife Tracking and Bird Count Surveys** can be conducted with community assistance. Farmers who invite their customers to the farm for U-Pick, CSAs, Pick-ups, volunteer work days, or celebrations, can solicit help from visitors.
- ❖ **Visiting Wild Farms** with local leaders, conservation groups, or children's classes can help educate the community about the ecological and economic values of these lands. In addition to the direct benefits of native plants and animals, benefits can also take the form of improved water quality and aesthetic values which increase land values and drive tourism.
- ❖ **Purchasing Products** grown on wildlife friendly farms will help secure farm viability and will thus help safeguard farm values. Value-added food and fiber produced on these farms can be bought directly from the farmer, or purchased through retail outlets that carry such products.

Providing Habitat Connectivity

By farming with the wild, habitat connectivity can be re-established. Below are just a few of the steps farmers and ranchers can take to further enhance their roles as conservationists committed to ecologically sustainable agriculture.

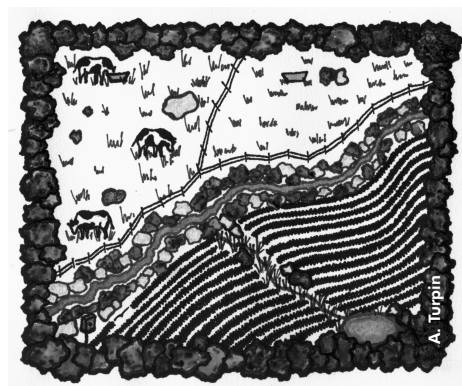
Farm and Ranch Strategies

- ❖ **Mapping the Landscape** can help ascertain which wildlife-friendly practices are best suited to the farm or ranch. Farmed areas, wildlife habitat, building sites, the surrounding watershed, and existing or potential linkages between natural habitat types can be indicated on the map, and changes in wildlife noted over time. If possible, other farmers on adjacent lands or in the watershed can work collaboratively to determine locations of optimum linkages.
- ❖ **Wildlife Monitoring** can help determine wildlife movement before linkages are created, and assess which species are using existing linkages. The booklet, “Monitoring on Your Farm,” by Yolo County RCD, provides step-by-step instructions (530-662-2037). Sharing results of tracking surveys with farmers and other land owners in a region can help foster understanding of the overall pattern of wildlife movement.
- ❖ **Providing Connectivity** on the landscape includes restoring riparian areas, planting hedgerows, windbreaks, and grassed waterways, and conducting agroforestry.
- ❖ **Using Complementary Practices** such as erosion control, water conservation, non-lethal methods of predator control, and organic pest management may help strengthen habitat connectivity.
- ❖ **Preserving and Restoring Native Habitat** on the farm or ranch can be achieved by eliminating non-native invasive species and encouraging the re-establishment of native vegetation. Local native plant nurseries and the North America Native Plant Society (www.nanps.org or 416-680-6280) are excellent sources of native plant information.
- ❖ **Enrolling in Conservation Easements** establishes long-term plans which encourage conservation practices, limit development rights, and provide financial benefits. The Land Trust Alliance (www.lta.org or 202-638-4725) furnishes contact information for land trusts nationwide.

Please contact the Wild Farm Alliance to share your experiences protecting wildlife species and habitat, or to request further information about our work.

It took hundreds of millions of years to produce the life that now inhabits the earth—cons of time in which that developing and diversifying life reached a state of adjustment and balance with its surroundings.

—Rachel Carson, *Silent Spring*



Riparian areas through farms and ranches, as well as native plantings along borders, can provide habitat and corridors for wildlife.

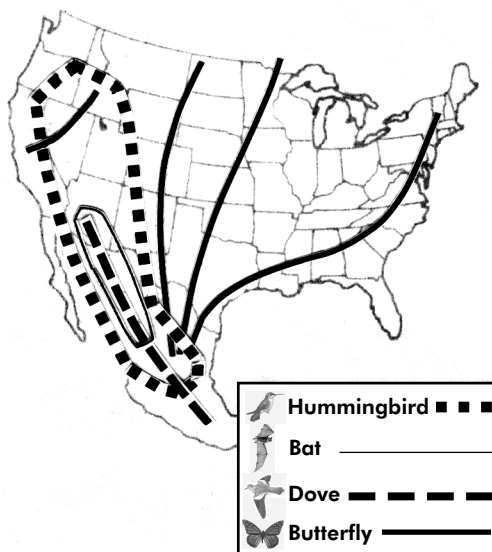


Flowering hedgerows provide nectar and pollen for beneficial insects and corridors for wildlife.

Why Connectivity?

- ❖ Twenty-nine species of mammals had disappeared from National Parks in the western United States by the late 1980s because the isolated reserves were not big enough to sustain viable populations of individuals.
- ❖ As many as 3,200 miles are flown by pollinating 'lesser long-nosed bats' in their round trip journey through nectar corridors.
- ❖ Monarch butterflies travel up to a 2,000-mile migration when refueling stops are present.
- ❖ More than 70% of all terrestrial wildlife species, including many threatened and endangered species, use riparian corridors during some portion of their lifecycle.
- ❖ Nest densities of over 1,100 nests per 250 acres of grassed waterways were reported in one Iowa study.
- ❖ At least 108 species of birds use windbreaks for foraging, nesting, or resting.
- ❖ An avid bird watcher spends between \$1,500-\$3,400 each year, often in or adjacent to wildlife linkages.
- ❖ Property values are higher when land borders amenities like riparian corridors.

Pollinator Flight Pattern



Following nectar corridors, the rufous hummingbird, lesser long-nosed bat, white-winged dove, and monarch butterfly migrate between Mexico and various points throughout the United States and Canada (after Nabhan, 2001).

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