

Advocates of the use of ecotypes

Comprehensive Wildlife Strategy [CWS] is a national challenge to broaden biodiversity and conserve species in peril of extirpation. CWS emphasizes development and enhancement of functioning habitats, natural communities and healthy ecosystems to benefit all wildlife from microorganisms and insects to mammals and birds.

Reintroduction of the correct genetic material for these habitats is the basis of this concept.

CWS has developed **four ecoregional** assessments within Missouri which correspond with the **four ecoregions** used by the Missouri Ecotype Program for the development of plant materials adapted to the two prairie regions.

CWS: “strive to prevent concern for or loss of species” (“Conservationist” Oct’05). **Our requesting ecotype material for our habitat reconstruction efforts** is the foundation for the prevention of loss of plants and the animals which have evolved with them.

National Forest Service Policy is to use locally collected seed if possible and to establish production fields of ecotype core species found within their ecoregions. See: Forest Service Manual, National Headquarters, Washington, DC, Native Plant Materials, FSM 2070 – Native Plant Materials, Zero Code

“Wild Ones natural landscapers advocates the selection of plants and seeds derived, insofar as is possible, from local or regional sources at sites having the same or similar environmental conditions as the site of the planting. Such plant material is often termed the local ecotype.” [from Wild Ones web site www.for-wild.org/land/ecotype.]

Why should we care?

“A thing is right if it tends to preserve the beauty, integrity and stability of the biotic community; it is wrong when it tends otherwise.”

- **Aldo Leopold, “The Land Ethic – A Sand County Almanac”**

We as conservationists are but human participants in a much larger and longer process ... one that stretches back to the first humans who held an understanding of their relationship to the world around them ... and a process that will not end within our lifetimes. This conservation process will inevitably continue to evolve as we learn even more about this fragile blanket of life that covers Earth.

The theories and principles that have governed conservation work have changed over time - with each new scientific discovery, with each new insight and with each new environmental crisis. The scale and scope of our work has changed – from individual fields to entire ecosystems and from farm ponds to entire watersheds.

We must also expand our view of the plant communities that surround us.

Instead of seeing plant populations as homogenous across their range, as interchangeable parts easily moved from one place to another without consequence, we must *become attuned to the variability within a species and the role of local factors in shaping these communities*. We must begin to work with the framework that tens of thousands of years of natural processes have built.

The details of concepts and practices suggested in this brochure will enhance our work as land stewards.

How will ecotypes improve the success of your native landscaping?

What is an Ecoregion?

An **ecoregion** is a sub unit of a large ecosystem defined as having its own geological, biological and climatic factors; differing from adjacent ecoregions.



from Atlas of Missouri Ecoregions; pub 2000, MDC



Ecoregions of the United States from: <http://www.epa.gov/wed/pages/ecoregions/ecoregions.htm>

What is an Ecotype?

An **Ecotype** is a plant or animal which is well adapted to its own ecoregion and not adapted or even invasive or otherwise detrimental in other ecoregions.

How does an ecotype differ from a native?

A **native** is a species occurring on the site or region or continent before Eurasian species were introduced.

There are at least two schools of thought in native restoration practices: **native vs. ecotype**.

“Isn’t using species that are natives enough? Why spend extra time and money to collect local seed or find a local ecotype seed dealer when we can buy native species from two states away?”

- The issues here are (1) scale or distance (broadscale ecosystem vs. large ecoregion vs. local habitats) and (2) environmental conditions including: climate, elevation, soil, drainage, aspect, and sun/shade.
- Purple prairie clover (*Dalea purpurea*) is a widespread prairie species. Seed from Oklahoma will likely bloom too late in Missouri to set seed. On the other hand, if it is successful, the new genotype can potentially swamp the area’s remnant genotype, to its potential demise.
- This stated scenario is based on 130 years of observation, physical testing and DNA laboratory testing. Within five generations of surviving offspring, a transplanted species becomes adapted to its new conditions. It has an influence on the remnant site natives. It WILL change the health and survival of that species.

How do ecotypes from different ecoregions compare?

Similarities

- Two plants from different regions **appear physiologically** to be the same species. When compared in a botanical dichotomous key, they have the same characteristics and can be categorized as the same species.

But there are important differences:

- Moisture needs
- Bloom time
- Seed set
- Frost resistance
- Pollinator life cycle
- Pollinator recognition
- Genetic crosses with remnant population creates genetic suppression and extinction
- Genetic crosses with remnant population creates genetic hybrid vigor and community domination.

For example, when new plant material is brought in from a distance, it will probably not be compatible with the remnant site conditions, because:

- Winter might not be long enough [or too long] to stratify and release germination.
- It might need less moisture than our clay soils provide. So if it germinates it might get root-rot.
- It might have a later or earlier bloom time than the same local species.
- Pollinators might not recognize and use it in the same way as local species.
- Pollinators might not have the life cycle timed to pollinate the new plantings.
- If genetic crosses with remnant plants do occur, they may cause weakness and extinction or hybrid vigor and community domination.

Why Choose Local Ecotypes?

To insure the greatest success in your landscaping efforts.

To preserve the genetic diversity and integrity of native plants.

To help preserve local pollinators, insects, birds, and mammals, and other wildlife which have co-evolved with plants of local ecotype and depend upon them for food, shelter, etc.

In general, the more closely you match the environmental conditions of the source of your plant material to that of the planting site, the better it will grow. Species have become genetically adapted to the local conditions to varying degrees -- some species more than others.

Local or Regional Sources: Plant material that originates in and is native to your geographic region is generally the best to use. These regions have ecological, not political boundaries, i.e. it is better to use a source from your geographic region but outside your state than to use a source from a different geographic region inside your state. Such regions are referred to as ecoregions by scientists. The ecoregions within the US are best delineated by The Environmental Protection Agency: <http://www.epa.gov/wed/pages/ecoregions/ecoregions.htm>

An all-important concern today is the preservation not only of species, but also of the genetic diversity within each species. A native species varies genetically in its adaptation to the particular localities and environmental conditions under which it grows. This results in a number of ecotypes of the same species or gradations (clines) between populations; **not clonal stock or cultivars**.