

Nurseries and Their Role In The Effort To Maintain Biological Diversity

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Abstract - Biological diversity will be an important factor that influences future management of our nation's forest resources. A critical component for managing these forests for biological diversity is the production of plant materials by public and private nurseries. There are many threats to our biological resources which may be mitigated by plant production in nurseries. Native plants can be used to replace introduced species. Plants can be used as tools to produce healthy watersheds, create fertile soils, generate breeding grounds for animals, clean air and water and help produce a stable climate. Populations of endangered and/or threatened plant species can be restored. The benefits gained by utilizing nurseries for plant production include improved and increased habitat for other species dependent on plant diversity. The cooperation of natural resource managers and partners with nurseries will lead to the maintenance and improvement of our currently diminishing biological diversity.

Nationwide controversies are ongoing over our degraded environments. Few environmental issues will affect the future management of our Nation's forest resources as much as the issue of biological diversity. Natural resource managers and ecologists have recognized the importance of adopting strategies that increase species and genetic diversity. Nurseries, public and private, can play an important role in maintaining and increasing biological diversity in our forests.

Edward O. Wilson in his book *The Diversity of Life*, described biological diversity as ". . . the key to maintenance of the world as we know it. Life in a local site struck down by a passing storm springs back quickly; opportunistic species rush in to fill the spaces. They entrain the succession that circles back to something resembling the original state of the environment." This definition sums up the goal of natural resource managers-healthy- sustainable ecosystems.

In discussing the issue of biological diversity one can find myriad opinions on the nature and extent of the economic consequences, social implications, and potential disruption of ecological processes that result from a loss of biological diversity. In spite of this, there appears to be general agreement that quality of life issues are linked to the maintenance of biological diversity.

While it is relatively easy to define what biological diversity is (variety of life and its processes), it is harder to understand the concepts of biological diversity. Developing strategies and programs that are acceptable to all parties becomes even harder. Biological diversity issues can not be addressed without the cooperative efforts of public and private landowners and other interested publics. As natural resource managers we have the responsibility to use our understanding and appreciation of the concepts of biological diversity to influence landowners and the general public about the importance of managing

land resources to ensure we maintain diverse biological resources.

The value of biological resources are not always represented in the market place, but they do have significant value to us as individuals and society as a whole. Wild species and their genetic variants contribute billions of dollars each year to agriculture, medicine, and other major industries. Plants have been used to develop cures for diseases such as Hodgkin's disease, childhood lymphocytic leukemia, and breast and ovarian cancers. The biological resources of this country and others have the potential for the development of new medicines, crops, soil restoring vegetation, petroleum substitutes and many other products that will never come to light if these plants and the ecosystems necessary for their survival are lost.

Equally valuable to society is the maintenance of essential life processes such as healthy watersheds, fertile soils, breeding grounds, clean air, clean water, and a stable climate. Conserving these processes is just as important as conserving individual species that inhabit natural ecosystems. Without species synergism ecosystems can not function effectively.

To help understand some of the factors affecting biological diversity and the role that nurseries can play it is important to understand some of the major threats to our biological resources. The following are some broad categories that affect biological resources:

- * Habitat alteration and loss
- * Non-sustainable harvesting
- * Increasing human population
- * Environmental pollution
- * Climatic change
- * Introduced species

Nursery programs can have a positive effect at mitigating many of the factors that are damaging our biological resources:

- * Plants and/or seeds can be used for restoration and improvement of damaged or lost habitats.
- * Tree improvement practices and subsequent nursery production can reduce harvest rotation time frames and create sustainable harvesting schedules.
- * Plant materials can be used in riparian zones to prevent chemical runoff from reaching ground and/ or surface water.
- * Tree planting has been used to extract and store carbon in an effort to reduce carbon

dioxide levels in the atmosphere.

* Nursery production can be shifted from a reliance on introduced species to production of native species.

States have a vital role to play in protecting habitats and wildlife. Through the development of nursery programs that address biological diversity issues and other strategies, states are establishing programs and activities for the conservation of biological diversity. There are several management actions that have been and are being adopted by states to address these concerns:

* Protection of essential habitat for native species. This is one of the most cost effective strategies for protecting biological diversity. Habitat protection not only preserves specific plants but also other dependent factors (i.e., host specific pollinators) that may be limiting factors outside of their natural habitat.

* Initiation or expansion of efforts to protect species "on the brink". These actions tend to be the most expensive and can result in long-term drains on limited management resources. For many of these species survival will depend upon human intervention (i.e., collection and raising of threatened or endangered plants).

* Creation of strong incentives to protect and restore native ecosystems on private property. Conservation of biological diversity has to involve both public and private owners. Through education and landowner incentives private land management practices can be influenced. Private forest land alone or integrated with state and federal lands offers important opportunities to conserve biological diversity and still allow for the production of timber and other commodities.

* Making the public aware of the importance of biological diversity and creating opportunities for the public to be involved in the development of solutions. Environmental education curriculums are being developed or expanded to help our youth team all sides of this issue. Through education of landowners and other citizens the general public can help develop viable solution for the conservation of biological diversity.

* Expanding scientific research and training focused on the challenges of conserving biological diversity. Scientific research will always be the foundation of solving biological diversity issues.

As each of these actions are considered, it is possible to see a role for nursery operations and the production of plant materials. Plant materials can play an important role in the protection of essential habitats. Nurseries can be centers for the growing and "banking" of threatened and endangered plants. The availability of low cost plant materials and other incentives can ensure landowners will set aside land for conservation purposes. Nurseries can become education centers to help inform the general public about biological diversity issues and methods. Nurseries have always played an important role within the scientific community as

a location for studies or the source of plant materials for research projects. Nursery operations can be one of the cornerstones in developing an effective state program that address biological diversity concerns.

State forestry organizations have an unique role in this process. In working with landowners and other interested groups, these organizations are positioned to plan, direct, and influence activities that affect biological diversity on private and public lands. The National Association of State Foresters (NASF) has adopted a policy that encourages the maintenance of biological diversity.

State forestry organizations have supported and helped develop the State and Private Forestry Programs of the United States Forest Service. These programs assist state forestry organizations and landowners to achieve resource management goals and the conservation of biological diversity. Funds to help support nursery operations have been a historical part of these State and Private Forestry Programs.

Biological diversity issues are not just a passing fad that will soon disappear. These issues while around for a very long time are now rising to the forefront. In 1991 the National Research Council recommended that the nation undertake a long-term program to restore 400,000 miles of rivers and 2 million acres of damaged lakes over the next two decades. In 1992 the Rio de Janeiro Earth summit resulted in many nations signing a treaty that included ecosystem restoration as a viable means to achieve biological diversity. In 1991, NASF adopted a resolution that encouraged the maintenance of biological diversity in the forest lands of the United States and agreed to maintain an active role in the support and development of national policies on this issues.

In the past several years, over 70 countries have participated in a process to generate agreements that define sustainable forest management in forests of the world. Conservation of biological diversity was selected as one of the important criteria that must be monitored to achieve this goal.

The American Forest & Paper Association has adopted a Sustainable Forestry Initiative. Under this program member companies will manage with a land stewardship ethic that integrates the growing, nurturing and harvesting of trees for useful products with the conservation of soil, air and water quality, and wildlife and fish habitat.

The conservation of biological diversity will require the cooperation among professional long separated by academic and practical tradition. The adoption of policies that conserve biological diversity will enable future generations to continue to enjoy the many benefits our Nation's forest provide into the next century and beyond. But none of this can happen without viable nursery operations that recognize that their policies have long lasting impacts on the natural resources of our nation.

Forestry is very unique. It must plan up to a century into the future, but is bound by the conditions and decisions of up to a hundred years in the past. As forest resource managers we must continually be aware that what we do today will have lasting impacts on future

generations. Nursery programs are an important factor in having a positive influence on our future forests.

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REFERENCES

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