

FYI

This is the August 8, 1992, EPA internal working document that directs the implementation of the UN treaty, Convention on Biological Diversity/Agenda21. Keep in mind that the EPA is a member of the IUCN which is the UN's environmental arm and that this was issued BEFORE the U.S. Senate had considered ratification of the treaty. Subsequently, the Senate canceled the scheduled vote because of its radical nature and it has never been ratified as we know. This action renders the U.S. Senate and the U.S. Constitution irrelevant along with Presidential Executive Order 12852 of June 29, 1993.

SP

U.S. Environmental Protection Agency

National Performance Review

Ecosystem Protection

August 6, 1993

Links to Key EPA Statements:

[Need for New Vision and Objectives](#)

[Reinventing Government to Protect Ecosystems](#)

[Feds to Develop Policy to Make Ecological Values Equal to Economic Values](#)

[Bureaucrats Must Make U.S. Policy/Implement International Agenda](#)

[Ecosystems to be Equal to Human Health](#)

[States Rights a Barrier to Implementation](#)

[Lack of EPA Control Over Local Policies](#)

[Need to Overcome Barriers to Landscape Planning](#)

Note: statements highlighted in **dark red** are important, **bright red** are very important

EXECUTIVE SUMMARY

Ecosystem protection is often seen as a goal which is in conflict with other societal and economic values and interests. There is increasing recognition, however, that economic stability is in fact interrelated with healthy, functioning ecosystems. Many sectors of our society are directly and indirectly affected by past and present ecosystem degradation. The Florida Everglades and the Chesapeake Bay are both examples showing how the cumulative effects of human activity can destroy the inherent capacity of natural systems

to sustain themselves, leading to significant economic dislocation. The unabated destruction of tomorrow, must be halted. A national effort is needed to promote balanced and sustainable uses of our natural resources. To fulfill its obligation to and role in this effort, the federal government and the EPA must change the way in which they function.

First, a broad national vision for change is needed. The federal government must focus this vision by creating and implementing a cohesive and comprehensive national policy on ecosystem protection. In order to reduce the fragmentation and inconsistency which rendered ineffectual prior ecosystem and natural resource management efforts, the Executive Branch should: (1) **develop a national ecosystem management policy which is implemented jointly by the appropriate federal agencies pursuant to an executive order;** (2) **develop and implement coordinated ecosystem protection initiatives among federal, state, and local governments, such as inventories, resource assessments, joint budget proposals;** and (3) **eliminate gaps and inconsistencies in existing laws and pass new laws such as establishing a "Green Bank Program" and other programs. (Note: dark red bold print is added for emphasis)**

Second, EPA should be a catalyst to the national vision for change by establishing and disseminating a set of organizing principles for ecosystem protection that can be used by Federal, state and local governments, citizens and other organizations. EPA should also implement structural changes through an ecosystem protection policy issued by the Administrator which establishes ecosystem task forces and ecosystem plans, and **institutionalizes ecosystem management principles.** EPA should make better use of its existing tools by: (1) **amending guidances and regulations to promote ecosystem protection;** (2) improving the implementation of the National Environmental Policy and the Endangered Species Act; (3) more fully utilizing grants, education, and nonregulatory programs such as ecosystem training and educating the public; (5) improving the ecological science base and sharing data. Further, **the Agency should practice ecosystem protection through geographic enforcement initiatives and regional landscape initiatives,** while promoting ecosystem protection to others through coordinated grants and using anticipatory planning.

VISION

The United States will develop and **implement a national policy to protect the sustainability of the natural systems** which provide economic prosperity and a high standard of living for the American people. The Environmental Protection Agency will play an important role in developing and implementing this policy by natural resources, and thereby protecting our natural heritage for present and future generations.

INTRODUCTION

Ecosystems-the complex of living and non-living components that function together as a unit in a given area such as wetland communities, estuaries and prairies-**form the core organizational structures of the natural world.** Ecosystems have a degree of inherent stability which helps them to resist some disruption. Significant man-made stressors,

however, such as over-grazing, unbridled commercial and residential development, over-population, pollution and a host of others, can alter ecosystems, affecting their ability to sustain life, including human life. The quality of life for humans is thus linked inextricably to the sustainability of ecosystems.

Ecosystem sustainability can be defined in a variety of contexts. For purposes of this document, it is the concept that humankind's interaction with the environment should strike a balance between the need to: (1) use natural resources to maintain a good standard of living; (2) prevent the destruction of natural resources, and, (3) accommodate future uses by subsequent generations.

Sustaining the ecosystems that comprise our natural world will require us to shift to a more holistic and coordinated approach to environmental protection-one which recognizes that protecting human interests ultimately requires us to protect the natural systems upon which we depend for survival. Only in this manner will our efforts begin to match the interrelatedness that is the defining characteristic of ecosystems themselves.

Recognition of this interrelatedness should be the first step toward reinventing our governmental and societal approach to ensure the protection and sustainability of ecosystems and natural resources.

The Executive and Legislative branches must undertake specific and coordinated actions in order to overcome existing barriers to ecosystem protection, which are both numerous and fundamental. **A national ecosystem management strategy should be based on:** (1) cooperative interagency institutional structures and public support; (2) sound scientific principles and research; (3) **ecological rather than political boundaries;** (4) resolving conflicting agency missions and statutory mandates; and, (5) **connections between social, political and environmental concerns.**

EPA should be a catalyst for Executive Branch leadership by developing ecosystem protection principles, by working to **integrate federal actions, and by establishing ecosystem protection partnerships with state and local governments and private entities.** EPA must also enact internal changes to integrate principles of ecosystem management at every level and in all functions of the Agency. Agency planning, decision-making, and actions must be guided by the underlying principles of ecosystem management and protection, such as sustainability.

Ultimately, through "environmental protection" statutes, the **EPA protects the various attributes of ecosystems**-for example, clean air and clean water. An ecosystem, however, is more than a simple sum of its parts. Disruptions to one part of an ecosystem ripple throughout the whole ecosystem, sometimes in unpredictable ways. Thus, government intervention to address one component of the system will not effectively protect the entire system.

Although **existing environmental statutes** in varying degrees require that EPA consider the impacts on the entire environment in the development of standards, **most standards are based primarily on human health impacts.** Moreover, to the extent that

environmental impacts are considered in standard development, such assessments are generally confined solely to those impacts which are of immediate concern to the program office developing the standard. Regulatory standards thus often fail to consider heavy metal are deposition into water bodies, or contaminated sediment resuspension.

Although changes must occur within governmental institutions and at different levels of society, they must be phased over a period of time in a coherent and integrated approach. This paper presents a national strategy for ecosystem protection and EPA's role in ecosystem protection. Specific timeframes for implementing the recommendations contained in this document vary depending on their complexity and scope, and on the differing capacities of governments and society to change. Also, several key aspects of this integrated approach need to be highlighted at the outset to emphasize central themes that infuse many of the recommendations contained in this document.

First, a stronger link between science and policy is stressed in many of the recommended actions. **The concept of ecosystem sustainability involves many areas of policy, for example economics and land use planning.** However, in approaching environmental protection from the ecosystem standpoint, the government and EPA in particular need to ensure that sound science is available and part of the ultimate decision-making process. Second, more than any other form of environmental protection, achieving ecosystem sustainability will involve **partnerships between all levels of government and its citizenry.** The need to arm governments and citizens with information and education is paramount to achieving the goals set forth herein.

A NATIONAL STRATEGY FOR ECOSYSTEM MANAGEMENT

In order to manage, protect and restore our vital natural resources and ecosystems, the United States needs to develop a national strategy for ecosystem management. Past efforts to protect the environment and to manage natural resources have been fragmented, often working at cross purposes. Most of the man-made and natural problems that have led to degradation and loss of ecosystems are still present. Policies and programs of federal, state and local agencies, as well as private organizations have in some cases resulted in degradation of our ecosystems and component natural resources. The President and Executive Branch should provide leadership by setting forth this national policy that establishes a means for protecting ecosystems and directs federal agencies to coordinate and collaborate to implement this national policy.

Target/Action Category: **A national policy should be established through Executive Branch leadership for the protection of ecosystems based on the principles of sustainable use.** This policy should be applicable to all federal agencies responsible for protecting the environment, managing natural resources, and infrastructure development.

Initiatives:

Coordinated Approach to Ecosystems Management. **Coordinated approaches to ecosystem management are necessary** for federal agencies to have a common

understanding of the ecosystems for which they are charged to protect and manage. The Office on Environmental Policy (OEP) should organize a series of "**sustainable ecosystem summits**" comprised of agency representatives, academics and stakeholders to establish this operational government definition and to set common goals for ecosystem management.

Better Use of the NEPA Process: The President should direct agencies to more effectively implement the NEPA process to plan, coordinate and integrate other environmental statutes for ecosystem protection. The NEPA process can serve to coordinate consideration of the substantive requirements of other environmental statutes, and can serve as a tool by which agencies can consider overall ecosystem-related issues. NEPA also requires a broad examination of environmental impacts not necessarily addressed by media-specific laws, and it is this integrated assessment that is particularly well suited to address ecosystem management.

Executive Order: **The President should issue and [sic] Executive Order that establishes a national policy for ecosystem management** and establishes a process for interagency cooperation. This policy should set goals for ecosystem management such as viable populations, sustainable use, maintenance of biodiversity.

Target/Action Category: All federal agencies should establish and incorporate ecosystem protection goals at all levels of activity.

Initiatives:

Regulatory Coordination: **Federal agencies should coordinate the implementation and enforcement of environmental laws with a view toward achieving protection at the ecosystem level.** Federal agencies will also need to identify barriers to full implementation of ecosystem protection, and identify statutory mandates and policies which conflict with the national policy of ecosystem protection.

Impacts of Federal Subsidies: Federal agencies should assess impacts of federal subsidies, and where appropriate, modify them to ensure ecosystem protection (e.g., grazing fees, mining, timber, agricultural water-use).

Budgets Based on Ecosystem Priorities: The Executive Branch should submit a re-structured budget that is fully consistent with the interagency coordination needed for ecosystem protection and research necessary for protecting ecosystems.

Target/Action Category: A federal policy should be developed that accounts for **ecological values equally with economic values.**

Initiatives:

Developing Measures of Ecological and Economic Value: The Executive Branch should form a national task force comprised of ecologists, social scientists and economists, **to**

develop measures which reflect the true value of ecological resources both in ecological and economic terms.

Revising GDP Indices: The Executive Branch should direct OMB and the Council of Economic Advisors (CEA) to work with all federal agencies to **review existing natural resource accounting methods and to revise GDP indices and other economic measures to include the loss of natural resources through exploitation.**

Executive Order 12291: The Executive Branch should revise Executive Order 12291 requiring cost-benefit analyses to reflect all societal and ecological costs and benefits over the long term (e.g., 100 years), including non-market values.

Target/Action Category: The United States should ensure that national policies take into account protecting global ecosystems.

Initiatives:

International Ecosystem Management: Natural resource and environmental agencies, particularly **EPA, USDI, and NOAA, should join with U.S. Agency on International Development to develop a joint strategy** (and accompanying budget request) for the use of U.S. government expertise to assist in integrated ecosystem protection in other countries and in areas beyond national jurisdiction. This effort would both **help the United States to fulfill its existing international obligations (e.g., Convention on Biological Diversity, Agency 21), to suggest future directions in international policymaking in the ecosystem protection area, and to provide a useful international perspective on more effective ecosystem protection domestically.** The Department of State should work closely with the agencies involved in the effort to promote innovative ecosystem management approaches in cooperation with other countries and in the negotiation of future international agreements.

Evaluating National Policies/International Obligations: **The Executive Branch should direct federal agencies to evaluate national policies on environmental protection and resource management in light of international policies** and obligations, and to amend national policies to more effectively achieve international objectives. The State Department, USDI, EPA, USFS, NMFS, and other involved agencies should be directed to further develop national and international policies related to ecosystem management. In addition, the U.S. should to [sic] develop human population policies that are consistent with sustainable economies and ecosystems.

Target/Action Category: Federal agencies should work with each other, as well as state and local governments to use all available mandates in a cooperative and integrated manner.

Initiatives:

Geographic Initiatives; Interagency work groups should develop coordinated ecosystem management programs in specific geographic areas (e.g., ecoregions, watersheds, physiographic provinces) in which multiple agencies of multiple programs are currently operating (e.g., San Francisco Bay Delta, Gulf of Mexico, Oak Savannah).

Coordinated Budget Submissions: Federal agency budget proposals should reflect intra-agency and interagency efforts to coordinate ecosystem protection (e.g., a specific percentage of budget must be joint submissions for ecosystem-related activities).

Managing Sustainable Ecosystems: Federal agencies should **convene summits for negotiating change in regional economics should be created as an essential means for managing sustainable ecosystems**. Coalitions of stakeholders in an ecosystem should examine ways in which to accommodate their respective interests while protecting the ecosystem.

Coordinated Inventory and Resource Assessments: Agencies with primary responsibilities for biological inventory, monitoring, and assessment (e.g., NBS, EPA, and USGS) should coordinate resource expenditures in carrying out these essential but costly functions. EPA should cooperate with the USDI's **National Biological Survey** (NBS), the lead agency, in ecological inventories. EPA should improve the coordination of monitoring and resource assessments currently being done by different agencies (such as the Interagency Task Force on Monitoring).

Target/Action Category: The Administration and Congress should work together to promote coordinated ecosystem management efforts.

Initiatives:

Coordinating Legislative Mandates: **An OEP-led interagency task force should identify conflicts and gaps in pollution control and resource management laws and present recommendations to Congress for legislative changes necessary to ensure national laws are consistent with the national policy for protecting ecosystems**. For example, the task force would recommend federal legislation providing agencies with the authority to anticipate and prevent biodiversity loss.

Directing Appropriations: The Administration and Congress should work together to direct appropriations so that ecosystem protection plans are implemented through coordinated efforts of federal agencies.

Establish "Green Bank": The Executive Branch (e.g., DOJ, OMB, and Treasury, EPA) should work with Congress to develop appropriate legislation that establishes a "Green Bank Program," in which permit fees, use fees, and enforcement penalties collected by federal agencies (e.g., USFS, USDI, NOAA, NMFS) can be earmarked for ecosystem protection and restoration.

Congressional Committee Coordination: The Committee on Congressional Reform should examine opportunities to coordinate the functions of the various committees that have jurisdiction over ecosystem management.

Ecosystem Protection Act: An Ecosystem Protection Act (similar to the Pollution Prevention Act of 1990) should be developed which requires federal agencies to integrate ecosystem management principles into their various functions, including their scientific, regulatory, permitting, policy, and enforcement activities.

II. EPA'S ROLE IN ECOSYSTEM PROTECTION

EPA has both the legislative authorization and expertise to play a crucial role in federal ecosystem efforts. Agency regulations, however, under these existing statutes have not been developed with full regard to ecosystem protection. As the regulator of the environment and a sponsor of basic ecological research, EPA is uniquely situated to expedite the dynamic two-way exchange of understanding between researchers and practitioners of ecosystem management, and to assure that current knowledge advances the protection of ecosystems. Success ultimately depends on EPA integrating ecosystem management at every level and function of the Agency. In particular, Agency planning and actions should be guided by underlying principles of ecosystem management and protection, and effects on ecosystem sustainability should be routinely weighed in EPA decisions.

Historically, EPA has primarily focused on the protection of human health with less consideration of the impacts on ecosystem issues. Congress has developed, in response to immediate concerns with critical environmental issues (e.g., toxic wastes, safe drinking water), media specific legislation. These actions have been translated into the organization and decisionmaking of the Agency. In order to achieve a successful cultural change, senior management must be fully committed to underlying principles of ecosystem protection, provide the necessary training, and make organizational adjustments as needed. **EPA must make ecosystem protection a primary goal of the Agency, on a par with human health, as recommended by the EPA Science Advisory Board.**

Gaps in the science and information base, an insufficient investment in EPA information management, and inexperience in new risk assessment methods hinder EPA's progress in ecosystem management. As the foundation for the Agency's ecosystem approach, **EPA should use a comparative risk-based approach** for setting long-term priorities and making daily Agency decisions. EPA can improve the scientific tools for ecosystem protection through its support of ecological research, environmental monitoring and assessment, and ecological information management.

EPA is now challenged to successfully integrate its risk-based methods, science and information base, and its varied authorities into a cohesive and effective ecosystem management approach. Outlined below are a series of initiatives, presented in a temporal sequence, that will build upon on-going Agency efforts at ecosystem protection. These

initiatives emphasize pollution prevention, multi-media enforcement, research into the causes and cures of environmental stress, education, and constituency building- all to sustain the integrity of our nation's natural resources and the ecosystems that support them.

Actions that should be implemented immediately

Target/Action Category: The Administrator should issue a policy statement **mandating the integration of ecosystem protection principles into all Agency programs and actions.**

Initiatives:

Ecosystem Task Force: An intra-agency task force should be convened to develop the Agency policy statement and provide guidance on its implementation. Coordination of ecosystem protection initiatives and actions would also be a function of the task force. The task force will be staffed on a full time basis with representatives from Headquarters and regional offices. Members of the Senior Leadership Council would serve as advisors to this task force.

Incorporating Ecosystem Principles: Each AA and RA should prepare an ecosystem protection implementation plan as part of their overall Strategic Plans and Agency Operating Guidance, with assistance from the Ecosystem Task Force. Additionally, specific changes to programmatic and Regional priorities should include: dedication of portions of the EPA budget specifically to fund ecosystem protection projects; reorientation of the STARS system to give credit for ecosystem management accomplishments; and use of regional/state ecological status and trends reports in planning and as a means of holding the Agency accountable for ecosystem protection. Ecosystem management principles should be incorporated into Agency operations such as performance standards, training for management and staff, performance awards, and Agency hiring.

Comprehensive Evaluation of Opportunities for Ecosystem Protection: To better utilize existing authorities, EPA should undertake a comprehensive evaluation of each program, to determine whether each fulfill its potential in ecosystem protection. Moreover, **EPA should promote more explicit ecosystem protection mandates in the reauthorization of EPA's statutes, where applicable, and in any new environmental legislation.** In conducting a review of its authorities, **each office should identify opportunities for ecosystem protection and barriers that may interfere.** Subsequently, program offices should determine priorities for action to overcome the barriers and explore new opportunities. One example is including ecosystem values in the cost/benefit analysis during the regulatory process (e.g., regulation of chemical substances under Section 6 of TSCA).

Implementing Ecosystem Management in Program Activities: Each program office should amend existing regulations and guidance as appropriate to allow for and promote

ecosystem protection. For example, the Superfund program could institutionalize ecological risk assessment by revising the Remedial Investigation/Feasibility Study Guidance to integrate ecological and human health risks. In addition, each program office should integrate regulatory authorities (e.g., permitting decisions) into resource planning initiatives (e.g., Watershed Protection Approach, Wetlands Advance Identification) where appropriate.

Barriers:

- lack of knowledge regarding ecosystem issues
- ecosystem level data in (sic) unavailable or difficult to access
- resistance to organizational change
- Lack or (sic) senior management support

Measures of Success:

- track specific ecological functions/values for improvement
- substantive change in organizational structure, and cross-program initiatives

Actions that should be completed in the next 6 to 12 months.

Target/Action Category: **The Agency should focus its regulatory efforts as a means to protect ecosystems.**

Initiatives:

Improved Implementation of the National Environmental Policy Act (NEPA): NEPA can serve to coordinate consideration of overall ecosystem-related issues. To make more effective use of the Agency's NEPA authorities, the Office of Federal Activities should develop criteria and guidance to ensure the assessment of cumulative impacts during NEPA review and require program offices to support NEPA documentation review to consider ecosystem impacts. Also, EPA should use Clean Air Section 309 authorities to require ecological considerations in NEPA analyses and reviews of regulations by other Federal Agencies. Importantly, if EPA programs continue to rely on procedures deemed to be functionally equivalent to NEPA, they should still ensure that the goals of NEPA are fully met.

Improved EPA Implementation of Endangered Species Act (ESA): The ESA is a statutory tool available to the agency for ecosystem protection, with multimedia and terrestrial applicability. Each EPA office should fully comply with the requirements of the ESA. Each program office should enter into an agreement (e.g., MOU) with the Fish and Wildlife Service and National Marine Fisheries Service to clarify EPA's roles and responsibilities to ensure full compliance with

Endangered Species Act (ESA). Clear guidance for ESA compliance on a program-by-program level should be developed and provided to regions and states.

Barriers:

- lack of knowledge
- ecosystem level data is unavailable or difficult to access
- medium-specific nature of EPA's statutes

Measures of Success:

- track specific ecological functions/values for improvement
- number of ecosystem-based enforcement actions taken

Target/Action Category: The Agency has the opportunity to focus its enforcement efforts on ecosystem level activities to more effectively protect human health and the environment.

Initiatives:

Multi-media Enforcement Approach: Given limited enforcement resources, the Office of Enforcement should issue a policy statement emphasizing the importance of a multi-media approach (e.g., air, water, land) in inspections and, where applicable, enforcement actions. The Office of Enforcement staff should coordinate with the program offices to ensure consistency with program goals through regularly scheduled ecosystem protection meetings. Moreover, the Office of Enforcement should provide multi-media training to Regional/State inspectors and other compliance staff.

Including Ecological Considerations in Enforcement Actions: **The Office of Enforcement should cluster enforcement actions on a geographic/ecosystem basis to address the cumulative impact of multiple facilities on ecosystems.** These multi-media enforcement initiatives would focus on specific ecosystems (e.g., San Francisco Bay Delta). Ecosystem status and trends on a landscape basis should be used, with some measure of program-specific flexibility, **to direct compliance inspections and enforcement activity at those facilities adversely impacting vulnerable and/or endangered ecosystems.** In addition, opportunities for the restoration, enhancement, and protection of local ecosystems should be mandatorily assessed in every enforcement action undertaken by EPA, and where appropriate, should be incorporated into all settlements negotiated by Agency enforcement officials.

Barriers:

- lack of knowledge
- ecosystem level data is unavailable or difficult to access
- **primacy of state enforcement**
- medium-specific nature of EPA's statutes

Measures of Success:

- track specific ecological functions/values for improvement
- number of ecosystem-based enforcement actions taken
- number of supplemental environmental projects

Target/Action Category: EPA should support state, local and private activities that lead to ecosystem protection and restoration.

Initiatives:

Awarding Grants: Each EPA grant program should develop ecological management and assessment criteria for awarding grants, where appropriate, to benefit priority ecosystems. In addition, the Office of Information Resources Management (OIRM) should develop a network for grant managers to coordinate grant efforts. For example, EPA could favor providing funding to farmers, through the states, who practice Integrated Pest Management. The Clean Lakes Program could increase the weight of criteria in ranking applications that place a high priority on aquatic habitat restoration. The same could be done for Outstanding Natural Resource Waters.

Increasing the Use of Anticipatory Planning: EPA regional programs should increase the use of anticipatory planning approaches (e.g., **watershed protection**, comparative risk assessment and ranking, critical terrestrial systems identification) to **protect key ecosystems** and to enhance public awareness and involvement.

Barriers:

- lack of information on where and what to protect
- lack of sense of priorities
- local political reluctance to do this
- **EPA has little influence over state and local policies**

Measures of Success:

- number of grants conditioned on ecosystem management practices implemented by state and local governments

● improvements in state capacity

***Actions that should be completed in the
next 1 to 2 years***

Target/Action Category: EPA should continue to support efforts to determine ecosystem status and trends and to make information readily available as an effective tool for decisionmakers.

Initiatives:

Secondary and Cumulative Impacts: Each program and regional office should assess secondary and cumulative impacts on ecosystems resulting from individual permit actions, as appropriate. For example, pesticide risk assessments should take into account cumulative impacts of all pesticides used in a given area such as a watershed.

Coordinating Status and Trends Data: EPA should closely coordinate with FWS, NOAA, USGS and other federal agencies on the timing, geographic coverage, and methods of their environmental monitoring programs to better document national ecological status and trends. Specifically, EPA should coordinate data on ecosystem extent, distribution, and changes, location and abundance of stressors, and the occurrence of widespread patterns of ecosystem impairment.

Assessing Ecosystem Values: EPA/ORD should develop methods for assessing the relative ecological and economic value of ecosystems that can be applied at the national, regional or state level. Regions, with partner, should use these methods to identify a priority list of areas that are critical to region-wide ecosystem sustainability.

Improving the Incident Monitoring of Ecosystems: The Agency should develop an improved system of monitoring the status and trends of ecosystems. An Incident Monitoring Program should be established that indicates the effects of all toxicants that can result in detrimental effects to the environment (i.e., fishkills, birdkills, etc.)

National Geographic Information System (GIS): EPA should strongly endorse the development of a national GIS data base as a key component of the Vice President's national information initiative. To date, establishment of a national GIS infrastructure has not been included in this initiative.

Barriers:

- inconsistent data and information among agencies
- reluctance to develop coordinated efforts for information exchange
- ecosystem issues have not traditionally been an Agency priority in developing information resources
- reluctance to invest in information collection and management systems

Measures of Success:

- greater accessibility of data to agency staff, other agencies and the public
- coordinated or at least complementary data/information systems
- generation of information on status and trends

Target/Action Category: An informed workforce and educated public are essential to developing and implementing ecosystem management initiatives.

Initiatives:

Ecosystem Training: EPA should develop training modules for EPA management and staff on ecosystem management principles, including general ecology, underlying Agency goals, and the fundamentals of ecological risk assessment.

Ecological Risk Management: EPA/ORD and other EPA programs should accelerate technical transfer of ecological risk management principles and methods through the development of guidance and training courses for EPA programs and staff, as well as other federal and state agencies and non-governmental organizations.

Environmental Education: The Office of Environmental Education (OEE) should evaluate environmental education curricula and other Agency outreach programs to assess how well ecosystem values and protection are being addressed. OEE should also educate the public on how they can take actions to protect ecosystems. This would include efforts to reach the state and local land use decision makers. In addition, OEE should direct its work within the Agency to determine each EPA office's projected staffing and skill mix needs.

Barriers:

- conflicting priorities
- education and training are not always priorities
- reluctance to participate in education/training programs
- conflicting priorities

Measures of Success:

- number of trained EPA staff

- number of cooperative education efforts
- number of guidance packages generated

Target/Action Category: EPA should support state, local and private activities that lead to ecosystem protection and restoration.

Initiatives:

Coordinating EPA Programs within the Agricultural Community: EPA should conduct a state-level pilot to coordinate all EPA programs affecting a particular sector of the agricultural community to assist farmers in complying with these programs (e.g., pesticides, non-point source pollution, wetlands, groundwater, groundwater protection.)

Local Geographic Initiatives: Regional comparative ecological risk analyses should be followed by new, local scale initiatives that enhance or maintain critical priority ecosystems. Such initiatives may include, restoration or rehabilitation of priority areas (or their critical components as a means of protecting whole ecosystems), targeted enforcement, and acquisition programs.

Ecosystem Protection Partnership Project: No single agency has the resources or expertise to independently address the threats to the nation's ecosystems. EPA currently maintains numerous clearinghouses for technology and information transfer, a number of which could be consolidated into an ecosystem clearinghouse. To facilitate information transfer among all agencies and the formation of inter-agency partnerships for ecosystem protection at all levels, EPA would promote the wide use of this resource by locating it on the Internet platform. The Ecosystem Protection Partnership Project would serve as a clearinghouse for information transfer as well as for matching partners with complementary skills, interests, and funding.

Regional Landscape Planning: EPA can take a number of actions that would **stimulate land use planning** by state and local governments in a constructive manner, and **which would not result in an overly intrusive federal role in land use planning**. EPA should direct grants to states and local governments to **form regional planning units around ecosystem protection and sustainability values**. EPA should provide technical assistance to the state and local governments, and will develop a list of suggested criteria for use by the state and local governments in their planning decisionmaking.

Barriers:

- lack of information on where and what to protect
- lack of sense of priorities
- **local political reluctance to do this**

● **EPA has little influence over state and local policies**

Measures of Success:

- number of grants conditioned on ecosystem management practices implemented by state and local governments
- improvements in state capacity

Actions that should be completed within the next 2 to 4 years.

Target/Action Category: EPA should continue to support efforts to determine ecosystem status and trends and to make information readily available as an effective tool for decisionmakers.

Initiatives:

Consistency and sharing of Data: EPA should continue cooperate with USGS, NOAA, and USFWS to develop national, up-to-date land cover/land use maps and remote sensing tools and make these data available to all WPA regional GIS programs and users. The Office of Information Resources Management (OIRM) should increase its information exchange with other agencies and organizations.

Linking Data Networks: OIRM should explore ways to link all ecological stressor-related information from the Agency's data bases in a comprehensive network. This effort could involve developing an inventory of all facilities which includes references to specific EPA program data bases. Potential non-point sources may be included via interpretation of GIS and other data.

Promoting the Sharing of Information: Internet is the world's largest computer network that stores and provides access to information on an array of subjects. To promote information sharing, EPA should be fully connected to the Internet and put its databases and other information on Internet. Access to information on the Internet will aid EPA in its data collection efforts, and help duplication of research efforts. By providing EPA's data other federal and state agencies, the international community, and local groups and communities will have access to the information. EPA should use its money from the High Performance Computing Act of 1991 to fund grants to local groups and communities to enable them to connect to the Internet.

Addressing Scientific Information Gaps: With funding from EPA and other sources the EPA Office of Research and Development (ORD) should address critical ecological science gaps as a high priority. These gaps generally include ecosystem structure and function relationships, indicators of ecological condition

or stress, techniques for ecological restoration, creation and enhancement, and spatial and temporal scale issues.

Barriers:

- inconsistent data and information among agencies
- reluctance to develop coordinated efforts for information exchange
- ecosystem issues have not traditionally been an Agency priority in developing information resources
- reluctance to invest in information collection and management systems

Measures of Success:

- greater accessibility of data to agency staff, other agencies and the public
- coordinated or at least complementary data/information systems
- generation of information on status and trends

Potential Reinvention Laboratories

Listed below are several geographic areas that should be considered as possible reinvention laboratories in which to test the ecosystem protection recommendations.

- Ecological risk assessment in an ecosystem/watershed context: Snake River, Clinch River, Middle Platte River, Waquoit Bay
- Emphasis on ecosystem protection in a terrestrial context: Adirondacks, Greater Yellowstone Ecosystem, Southern Appalachians
- Interagency cooperation to determine the effectiveness of using land cover/land use information (GIS) for ecosystem level enforcement, pollution prevention, and education: Savannah River, Pacific Northwest
- Establish a case study to compare conventional management criteria (e.g., chemical) to biological/ecological criteria: Upper Tennessee River
- Developing a framework in partnership with others, for ecological restoration: Oak Savannah, Indiana Dunes (Lake dunes)

Working with its federal partners, EPA will develop a joint plan on how to recover endangered, threatened, and candidate species on an ecosystem basis: Clinch River, South Florida (Florida Bay, Everglades), Southern California

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