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ENFORCEMENT

Also see National Environmental Policy Act and related tables and figures in Part II.

Strong enforcement supports environmental progress in two ways: by correcting specific violations of environmental law and, more generally, by deterring potential violations. Firm and fair enforcement ensures a level playing field for private-sector competitors and spurs polluters to look beyond mere compliance to preventing pollution in the first place.

In 1992, continuing a 3-year trend, civil and criminal penalties for federal environmental violations reached an all-time high. This trend likely will continue, since the Pollution Prosecution Act of 1990 authorized additional civil and criminal investigators for the Environmental Protection Agency (EPA) through 1995. In addition, EPA and the Department of Justice (DOJ) introduced new enforcement techniques and market incentives to gain the greatest environmental benefits as rapidly as possible.

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Highlights of Environmental Enforcement

In fiscal 1992 the federal government collected the criminal penalty and first payments of the civil settlement in the Exxon Valdez case--the largest environmental settlement in history. Even without the Exxon case, enforcement statistics continued an upward trend:

- Civil judicial enforcement actions returned \$41 for every \$1 spent;
- For the fourth straight year, the value of civil, administrative, and judicial enforcement efforts exceeded \$1 billion, with the figure for 1992 approaching \$2 billion;
- Of jail time imposed, 91 percent was served;
- Civil penalties came to \$65.6 million, almost double the fiscal 1991 figure, which had been the highest in history;
- A record number of criminal indictments, 174, were handed down; and
- Criminal penalties, in addition to the Exxon penalty, reached a new record of \$38 million.

The following achievements in the federal criminal enforcement program had major deterrent effects:

- The Rockwell Corporation agreed to pay the largest Resource Conservation and Recovery Act (RCRA) criminal fine in history, \$18.5 million, for RCRA and Clean Water Act felonies in managing hazardous wastes at the Department of Energy facility at Rocky Flats, Colorado.
 - Chevron pleaded guilty to 65 Clean Water Act violations, paying \$1.5 million in civil and \$6.5 million in criminal fines--the third largest criminal penalty assessed under any environmental statute.
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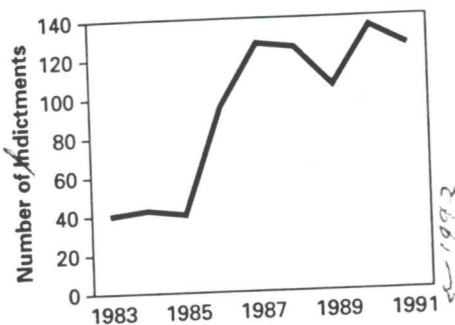
Conditions and Trends

To implement an Enforcement Four-Year Strategic Plan, EPA pursued a risk-based approach to environmental enforcement. The plan has the following objectives:

- Identify violations that involve the most significant environmental and health risks;
- Employ, where appropriate, several statutes in an integrated, comprehensive enforcement action;

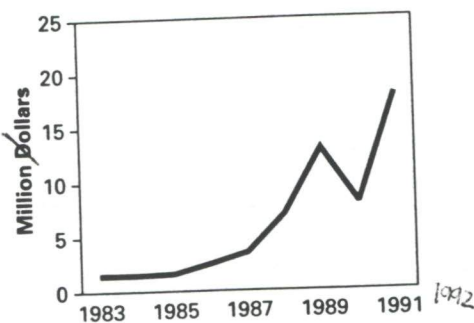
ENFORCEMENT

Federal indictments for environmental crimes.



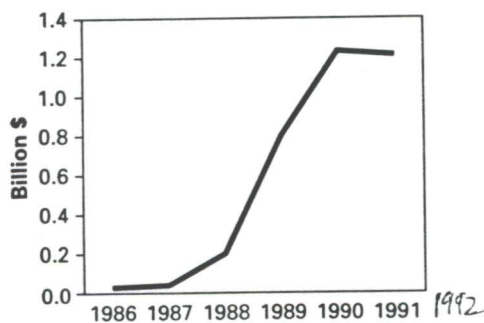
Source: U.S. Department of Justice, Environmental Crimes Division, Washington, DC, 1991.

Federal fines collected for environmental crimes.



Source: U.S. Department of Justice, Environmental Crimes Division, Washington, DC, 1991.

Dollar value of federal environmental enforcement actions.



*Includes civil penalties, settlements, cost recoveries, and injunctive relief; for the latter, data is not available prior to 1988.
Source: U.S. Department of Justice, Natural Resources and the Environment Division, Washington, DC, 1991.

- Use innovative enforcement tools such as environmental auditing to promote pollution prevention; and
- Choose enforcement actions that maximize the deterrent effect on other potential violators.

Historically most environmental enforcement has been media-specific, focusing, for example, on violations affecting air or water in specific locations. A large part of the enforcement effort will continue to be media-specific, seeking penalties through provisions of the Clean Air Act (CAA), Clean Water Act (CWA), Resource Conservation and Recovery Act (RCRA), or other statutes. However, these media-specific priorities increasingly will be supplemented by targeted multimedia initiatives to deal with violations caused by specific pollutants or industries across entire geographic areas and ecosystems. For example, multimedia cases were filed in 1992 affecting benzene emissions, the import and export of hazardous wastes, pulp and paper manufacturing, metal manufacturing and smelting, organic chemical manufacturing, and cleanups along the U.S.-Mexico border.

Because of the vast number of potential prosecutions, the federal government encouraged greater self-auditing and policing by regulated entities. In 1991 DOJ announced an environmental audit policy that views such voluntary actions as mitigating factors in the exercise of enforcement discretion. Responding to the concern that aggressive enforcement might deter voluntary

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self-audits and disclosure, the policy describes the factors DOJ considers in bringing criminal prosecutions.

Policies and Programs

The following are highlights of federal environmental enforcement in 1992.

Multimedia Enforcement

EPA has modified procedures for inspecting facilities and for screening to identify cases for multimedia enforcement. To provide the capability to find patterns of non-compliance within or across environmental media, EPA developed a system that links various compliance databases and is available for use by the states. Major multimedia enforcement efforts in 1992 include the following:

Industrial Enforcement. EPA launched the first coordinated enforcement initiative involving specific industrial sectors. On September 10, 1992, EPA and DOJ filed a series of enforcement cases against industrial facilities in the pulp and paper manufacturing, metal manufacturing and smelting, and industrial organic chemical manufacturing sectors--sectors which EPA identified as having a significant incidence of noncompliance with environmental standards and large amounts of reported releases of toxic substances to the environment.

The 22 civil and administrative enforcement actions filed involved violations of several environmental statutes including the CWA, RCRA, CAA, Toxic Substances Control Act, and Emergency Planning and Community Right-to-Know Act. By concentrating enforcement authorities on non-compliant industries, EPA expects to increase compliance rates with all environmental statutes throughout these industrial sectors and to foster greater use of pollution prevention, pollution reduction, and other innovative solutions to compliance problems.

Benzene Initiative. On August 5, 1992, EPA and DOJ announced the settlement of a \$1 million benzene enforcement action against a Chevron petroleum refinery in Philadelphia. The settlement was by far the largest penalty to date obtained for violations of hazardous air pollutant standards for benzene. At the same time, EPA and DOJ entered into a settlement with a Sharon Steel plant in Monessen, Pennsylvania, for a benzene-related civil action.

EPA also instituted seven administrative enforcement actions against companies alleged to be in violation of federal requirements aimed at preventing releases of benzene into the environment. These simultaneous filings under the CAA, RCRA, and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA also known as Superfund), signaled an EPA crack-down on violators of environmental standards designed to protect the air, water, and land from the hazards of benzene pollution.

Mexican Border. In June 1992 EPA announced the first enforcement actions in the United States resulting from efforts outlined in the Integrated Environmental Plan for the Mexican-U.S. Border Area. A total of 17 federal and state actions against facilities on the border sought \$2 million in penalties. These actions involved two criminal indictments and ten civil actions for violations of federal air, toxic substance, community right-to-know, and waste laws.

Bankruptcies. The federal government used a coordinated multi-facility, multimedia approach to environmental enforcement when companies with violations or liabilities at numerous sites filed for bankruptcy and sought to require the government to adjudicate environmental claims during the course of the bankruptcy proceeding. In 1992 the United States was involved in two complex estimation hearings involving Superfund sites: In re National Gypsum Co., (N.D. Tex.) involved four Superfund sites, and In re CF&I Fabricators of Utah, Inc., (D. Utah). The federal government also entered into comprehensive settlements for In re U.E. Systems, Inc. (N.D. Ind.) and In re Insilco Corp. (W.D. Tex.), which resolved claims at numerous Superfund sites and provided a mechanism for addressing future claims arising from pre-bankruptcy conduct.

Media-Specific Enforcement

The following are highlights of 1992 media-specific enforcement.

Air. In addition to implementing the Clean Air Act Amendments of 1990, EPA settled several major cases and recovered \$15 million in penalties. For example, in a case against Bethlehem Steel, EPA addressed unlawful emissions presenting significant risks to human health and the environment in densely populated areas of Pennsylvania. The action significantly reduced benzene emissions and recovered \$5 million, a record monetary settlement in stationary-source enforcement.

In addition, on May 20, 1992, EPA announced the coordinated nationwide filing of over 50 Clean Air Act administrative penalty cases. Filed in 26 states and Puerto Rico, the cases enforced various Clean Air Act provisions and regulations, including new requirements for continuous emissions monitoring equipment at petroleum refineries, national emissions standards for asbestos, benzene and uranium mining waste piles, and state standards for smoke density and airborne particle emissions. The initiative helped inform the regulated community of the new administrative penalty authority granted to EPA under the Clean Air Act Amendments. This authority is one of several new enforcement tools provided to EPA by the amendments.

Hazardous Waste. Increased and consistent environmental enforcement has reduced instances of deliberate improper waste

Federal administrative enforcement actions, by environmental law.

Fiscal Year	CAA	CWA/ SDWA	RCRA	CERCLA	FIFRA	TSCA	EPCRA	TOTAL
1972	0	0	—	—	860	—	—	860
1973	0	0	—	—	1,274	—	—	1,274
1974	0	0	—	—	1,387	—	—	1,387
1975	0	738	—	—	1,614	—	—	2,352
1976	210	915	0	—	2,488	0	—	3,613
1977	297	1,128	0	—	1,219	0	—	2,644
1978	129	730	0	—	762	1	—	1,622
1979	404	506	0	—	253	22	—	1,185
1980	86	569	0	0	176	70	—	901
1981	112	562	159	0	154	120	—	1,107
1982	21	329	237	0	176	101	—	864
1983	41	781	436	0	296	294	—	1,848
1984	141	1,644	554	137	272	376	—	3,124
1985	122	1,031	327	160	236	733	—	2,609
1986	143	990	235	139	338	781	0	2,626
1987	191	1,214	243	135	360	1,051	0	3,194
1988	224	1,345	309	224	376	607	0	3,085
1989	336	2,146	453	220	443	538	0	4,136
1990	249	1,780	366	270	402	531	206	3,804
1991	137 *	1,745 **	364	269	300	422	179	3,416
1992								

* Does not include asbestos demolition and renovation data.

** Does not include SDWA data.

Note: CAA = Clean Air Act; CWA/SDWA = Clean Water Act/Safe Drinking Water Act; RCRA = Resource Conservation and Recovery Act; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act (Superfund); FIFRA = Federal Insecticide, Fungicide, and Rodenticide Act; TSCA = Toxic Substance Control Act; EPCRA = Emergency Planning and Community Right to Know Act (Title III, Superfund Amendments and Reauthorization Act of 1986).

Source: U.S. Environmental Protection Agency, FY 1991 *Enforcement Accomplishments Report*, (Washington, DC: EPA, 1991).

To be updated.

disposal. Companies now carefully investigate brokers and waste disposal operations before dealing with them, and disposal companies carefully sample and inspect what they receive. This extra care in the system reflects vigorous enforcement of RCRA requirements and of the Superfund liability scheme.

- **Illegal Operator Initiative.** In 1992 EPA, through a RCRA enforcement program, targeted facilities that failed to provide required notification to the federal government regarding their handling of hazardous wastes. Non-notifiers included violators of the new toxicity characteristic rule. On February 4, 1992, EPA announced the Illegal Operator Initiative, which consists of 27 federal administrative cases and 24 state civil actions. In this effort, the first federal hazardous waste enforcement initiative to include state cases, the governments assessed \$20 million in total penalties. EPA also announced federal criminal enforcement actions, including five guilty pleas and six indictments involving hazardous waste violations.
- **Superfund Response Work.** Under CERCLA, EPA has broad enforcement powers to protect human health and the environment from hazardous substances releases. The proportion of Superfund response work conducted through enforcement actions has grown steadily since CERCLA was amended in 1986. In 1992 responsible parties accounted

for two-thirds of new Superfund response actions being obtained by EPA, up from 38 percent three years ago. The total amount of response work obtained from responsible parties now exceeds \$5 billion, with recoveries for each of the past two years exceeding \$1 billion. Each dollar spent for enforcement has produced \$8 in response work or cost recovery.

- **CERCLA Settlements.** In fiscal 1992 DOJ entered into a series of settlements--valued at \$285 million--in three major Superfund lawsuits that were first filed in the infancy of hazardous waste litigation--(Midco in 1979 and Stringfellow and AVX in 1983. In succeeding years, the cases were heavily litigated. In United States v. Midwest Solvent Recovery, Inc. ("Midco") (N.D. Ind.), the settlement involved implementing hazardous waste cleanups at the Midco I and II sites in Gary, Indiana, reimbursement of the United States for past costs, and payment of a fine for non-compliance with an administrative order. The settlement in United States v. J.B. Stringfellow, Jr., (C.D. Cal.), was valued at \$150 million and covered past costs and injunctive relief. In United States v. AVX Corporation, et al. (D. Mass.), the settlement involved cleanup of PCB contamination and restoration of New Bedford Harbor.

- **NPL Sites.** In another Superfund development, a federal district court upheld EPA authority over that of states to set cleanup priorities and choose final remedies at federal facilities on the National Priorities List (NPL) (United States v. State of Colorado, et al. (D. Colo. 1991)). The case is now on appeal to the United States Court of Appeal for the Tenth Circuit. If upheld, this decision will expedite decisionmaking and decrease time-consuming litigation over CERCLA sites at federal facilities.

Toxics. To protect human health and the environment from harmful substances, a number of federal agencies cooperate on enforcement actions. A sampling follows of cooperative efforts by such agencies as EPA, the Occupational Health and Safety Administration (OSHA), the Food and Drug Administration (FDA), the Department of Agriculture, and the U.S Customs Service.

- **Toxic Exports.** EPA, with FDA input, sets permissible tolerances for pesticide residues on food products. FDA is responsible for analyzing food imported into the United States, and EPA is responsible for ensuring that any pesticides exported from the United States meet certain export requirements. In the past, the agencies have found beef, winter fruits, and even coffee to be contaminated with toxic pesticides. Existing pesticide export requirements

include bilingual labeling instructions to promote foreign worker protection and proper pesticide applications and foreign purchaser acknowledgments, issued to EPA and the nation of destination and use. These requirements help prevent illegal or unwanted American pesticides from being illegally exported or improperly used. In the past two years, EPA enforcement actions against exporters collected \$700,000 in fines.

- **Food Safety.** To set food residue tolerances, FDA and EPA rely on timely and accurate data submitted by pesticide manufacturers. Residue data analyses allow EPA to make scientific judgments regarding the long-term fate or degradability of certain commercial chemicals as used in actual field situations. In 1991, as part of the National Food Basket Survey, EPA discovered that pesticide residue data for more than 25 registered chemicals appeared to be unreliable and might have been deliberately falsified. On August 25, 1992, following an extensive investigation, EPA and DOJ announced the indictment of the president of Craven Laboratories, in Austin, Texas, along with indictments or criminal informations for ten present and former staff members of the lab. Data for more than 200 pesticide residue studies may turn out to be suspect.
- **Worker Health.** Workplace injury from chemicals and chemical exposure remains a serious threat to many Americans. In a

formal working relationship, EPA and OSHA focus attention on the potential threats that chemical use, distribution, or disposal create for American workers. The agencies conduct joint inspections, inspector training, and data exchange on target problem areas. EPA is litigating its first case involving a fatality from a toxic chemical. The violation was failure to report the death to EPA as required by the Toxic Substances Control Act.

- **Asbestos in Schools.** Prior to 1976 many schools were constructed with asbestos because of its fire-resistant properties. When the potential carcinogenic properties of airborne asbestos became apparent, EPA established requirements for schools to develop plans to either remove or manage asbestos in a way that protects human health and worker safety. Many schools, lacking the specialized expertise to develop management plans, retained private contractors to develop school management plans. However, EPA learned that some contractors developed plans that were inadequate for purposes of managing asbestos. One company, Hall-Kimbell, prepared management plans for 20 percent of all school districts in the United States, representing more than 25,000 separate school buildings. Litigation resulted, and, to date, 21 cases have been filed, seeking civil penalties of \$6.5 million dollars and correction of each management plan.

- **Chemical Health and Safety Data.** Over 100 companies have registered for the EPA Toxic Substances Control Act Compliance Audit Program. Participating companies voluntarily submit late health and safety reports on chemicals and pay stipulated penalties that average \$5,000 per late report. Such penalties are lower than the statutory maximums that EPA could impose. The program has increased compliance with the data-reporting requirement of TSCA and has provided valuable health and safety data. To date, EPA has received 5,500 late reports.

Water. In 1992 EPA enforcement under the Clean Water Act focused on environmental areas with cases of major non-compliance. In addition, EPA regional offices developed geographic enforcement initiatives, such as the Grand Calumet River initiative, which impacted the Great Lakes. Major cases involving CWA enforcement included:

- United States v. City of Beaumont, Texas (E.D.Tex). The district court awarded a penalty of \$400,000 against the city. The penalty represented the savings to the city of non-compliance (\$316,000) and a gravity component (\$84,000). The court found that the city had failed to complete key pretreatment tasks on time, including sampling and analysis of industrial users, issuing permits requiring industrial

self-monitoring, taking enforcement actions, and publishing a list of significant violators in the newspaper.

- United States v. Butte Water Co. (D.Mont.) and United States v. Silver Bow Water, Inc. et. al (D.Mont.). In these cases, EPA enforced the Public Water Supply requirements of the Safe Drinking Water Act (SDWA) against larger water systems. On May 15, 1992, the court entered a consent decree, which settled all injunctive relief necessary to ensure that the owners and operators of the drinking water system come into full compliance with SDWA as quickly as possible.

Wildlife and Fisheries

A strong enforcement program in this area continued in 1992.

Black-Market Walrus Ivory. In Alaska, 29 individuals were charged with illegally killing walrus and trafficking in walrus ivory and drugs. An investigation by the U.S. Fish and Wildlife Service found that killings of walrus for their ivory increased after the United States banned the import of African elephant ivory in 1989. A 2-year undercover sting operation revealed a black-market trade in walrus ivory, including the trading of ivory for drugs. To date, 25 of the defendants have been tried and convicted or have pleaded guilty, typically of multiple felony charges.

Exotic Bird Smuggling. Convictions and guilty pleas to multiple felonies resulted from prosecutions of individuals

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involved in exotic bird smuggling from Mexico, Australia, and New Zealand into the United States. Additional prosecutions are expected to grow out of the 3-year undercover Operation Renegade.

Fishing Laws. In 1992 the U.S. Coast Guard continued air and surface patrols to detect and deter violations of fishing laws and regulations.

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International Cooperation

Recognizing the increasingly transnational aspects of environmental protection, the federal government in 1992 fostered international cooperation in environmental enforcement. Examples of federal efforts follow.

International Treaties. The United States enforces U.S. laws that implement international environmental treaties. To enforce Annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL), which prohibits discharge of plastics, the U.S. Coast Guard will bring enforcement actions against ships entering U.S. ports for all suspected violations that occur within the U.S. 200-mile exclusive economic zone. In the area of toxic exports, in June 1992 DOJ brought criminal charges against several companies and individuals for illegal export of hazardous waste to Bangladesh and Australia.

Assistance to Developing Nations. The United States assists developing nations in strengthening their own environmental enforcement capabilities.

Bilateral Linkages. Building bilateral linkages with counterparts promotes cooperation in enforcement in such areas as transboundary pollution, illegal traffic in hazardous wastes and toxic substances, and smuggling of endangered species. In 1991 the United States and Mexico established a Cooperative Environmental Enforcement Work Group to plan and carry out information exchanges and coordinated enforcement actions. In addition to training U.S. and Mexican investigative personnel, EPA is establishing a compliance tracking system to support multimedia environmental enforcement in the Mexican border area.

DOJ has represented the United States and the International Boundary and Water Commission in judicial proceedings pertaining to the U.S.-Mexico border environment.

Global Networks. The nation is developing global environmental enforcement networks. For example, in 1992 the United States participated in international meetings such as the Twelfth Annual Attorneys General Border Conference, held in Phoenix, Arizona, and the Second International Conference on Environmental Enforcement held in Budapest.

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FEDERAL FACILITIES MANAGEMENT

Also see Department of Defense, Energy, Pollution Prevention, and related tables and figures in Part II.

The current environmental focus of federal facility management is on pollution prevention, control and cleanup of pollution, and compliance with environmental regulations.

Conditions and Trends

In 1992 federal agencies conducted environmental initiatives at their facilities to achieve the following objectives:

- Source reduction of pollution,
- Procurement of quality recycled products,
- Increased use of alternative-fuel vehicles,
- Development of energy efficient and ozone-friendly consumer products, and
- Environmentally safe handling and disposal of hazardous materials.

Pollution Prevention

The federal government has endorsed recycling and energy efficiency to benefit the environment and provide cost-savings. Federal facilities are using their purchasing power to develop markets for recycled products and to reduce energy consumption in government buildings.

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Pollution Control

In 1992 the Congress passed and the President signed into law the Federal Facilities Compliance Act, which allows the Environmental Protection Agency (EPA) and the states to enforce hazardous waste laws at federal facilities. This law waives federal sovereign immunity with regard to enforcement actions taken by states and EPA under the Resource Conservation and Recovery Act (RCRA) at federal facilities. EPA and the states now have explicit authority to impose fines and other penalties against federal agencies for hazardous waste violations.

Federal agencies continued to clean up hazardous waste sites located at their facilities in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). The National Priorities List (NPL), maintained by EPA to identify the most seriously contaminated toxic waste sites, included 116 sites at federal facilities.

The Department of Defense (DOD) and the Department of Energy (DOE) lead in numbers of NPL sites, although other agencies, including the Department of the Interior, Department of Transportation, and General Services Administration, also are cleaning up NPL sites. EPA and the states continued to work with federal agencies to hasten environmental remediation and restoration.

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Environmental Planning

In addition to the cleanup of facilities, federal agencies instituted environmental quality goals. To move beyond compliance with environmental regulations, federal agencies took the following actions:

- Collected and monitored baseline environmental information at federal facilities,
- Monitored environmental requirements,
- Assessed environmental management practices and revised as needed,
- Instituted source reduction and waste minimization,
- Instilled an environmental ethic in employees through training and education, and
- Developed and implemented comprehensive environmental audits.

Policies and Programs

Two executive orders issued by the President in 1991--one on waste reduction and recycling at federal facilities and the other on reductions in energy use at federal facilities--set the tone for environmental programs in all federal departments and agencies. The General Services Administration (GSA) is the lead agency for waste reduction, recycling, and energy management by federal facilities. In addition to such GSA programs, federal agencies undertook a number of other environmental projects. A

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sampling of efforts made by federal facilities in 1992 to comply with the executive orders, to prevent pollution, and to clean up existing pollution follows.

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Executive Orders on Federal Facilities Management

In 1992 federal departments and agencies initiated programs to comply with two executive orders issued by the President in 1991.

Federal Energy Management. Federal facilities took actions to comply with Executive Order No. 12759 signed by the President in April 1991:

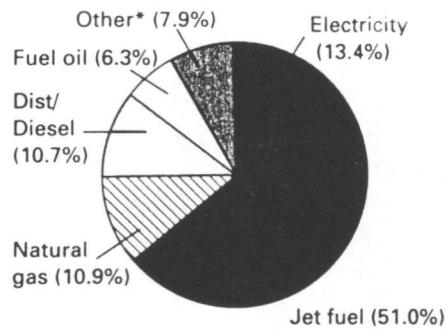
- **Energy Use Reduction.** Federal agencies are taking steps to reduce energy use in federal buildings to 20 percent below 1985 levels by 2000;
- **Gas and Diesel Reductions.** Federal agencies are reducing gas and diesel use in federal fleets of 300 or more vehicles to achieve a goal of 10 percent below 1991 levels by 1995; and
- **Alternative-Fuel Vehicles.** Federal agencies are moving to procure the maximum practicable number of alternative-fuel vehicles (AFVs) by the end of 1995.

Federal Waste Reduction and Recycling. In October 1991 the President signed Executive Order No. 12780, which requires federal agencies to reduce wastes and increase recycling through the following programs:

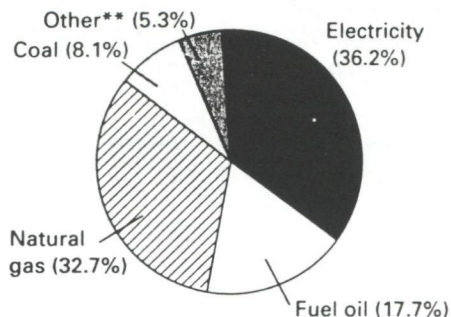
- **Waste Reduction and Recycling.** Federal agencies are promoting cost-effective waste reduction and recycling of reusable materials in operations and facilities; and
- **Recycled Products.** Federal agencies are procuring items made from recycled materials in accordance with the Resource Conservation and Recovery Act (RCRA).
- **Recycling Coordinators.** In 1992 the Environmental Protection Agency designated a federal recycling coordinator to assist federal agencies with waste reduction, recycling, and procurement of recycled materials and to report annually to the Office of Management and Budget (OMB) on

Federal energy use.

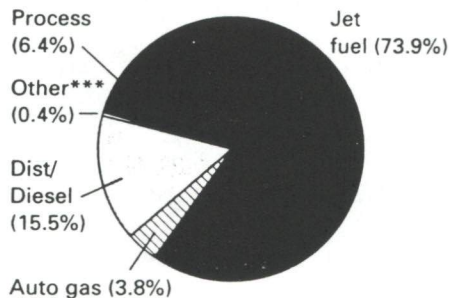
Total (1.44 quads)



Buildings and facilities (0.45 quads)



General operations (0.99 quads)



*Includes auto gas, Navy Special fuel, purchased steam, coal, Lpg/propane, and aviation gas (non-jet).

**Includes purchased steam, Lpg/propane, and other fuels such as renewable energy sources.

***Includes Navy Special, Lpg/propane, aviation gas, and other fuels such as renewable energy sources.

Note: Data is for 1990. Conversion factor for electricity is 3,412 Btu per Kilowatt hour.

Source: U.S. Department of Energy, *Annual Report to Congress on Federal Government Energy Management and Conservation Programs, Fiscal Year 1990*, (Washington, DC: DOE, 1991), page 7.

To be updated.

federal waste reduction and recycling. To date, 50 agencies have named federal recycling coordinators and 36 have submitted status reports on affirmative procurement programs to purchase products made from recycled materials.

- **Council on Federal Recycling and Procurement Policy.** In June 1992 this council, created by the Executive Order, sponsored a 2-day "Government Buy Recycled Products Trade Fair and Showcase." Over 3,000 vendors demonstrated the diversity and quality of products made with recycled materials and attended workshops with government procurement officers.
-

General Services Administration

GSA administers an array of environmental programs, among them, waste reduction, gas and diesel restrictions, recycling and the use of recycled products, CFC reductions, and energy efficiency.

Waste Reduction. Federal agencies are reducing paper consumption by making use of advanced technologies, such as electronic data interchange, computer networks, electronic mail systems, and voice mail. An example is the Multi-User File for Interagency News (MUFFIN) that makes information about supply programs available by computer and modem and has the potential to reduce federal paperwork. MUFFIN could eliminate 350,000 hardcopy documents, ranging from requisitions to discrepancy reports, sent from client agencies to GSA each year. Since 1983 GSA alone has saved 1,604 tons of paper through the use of computer technology. In addition, federal agencies are using

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environmentally sound packaging and two-sided duplicating machines.

Gas and Diesel Restrictions. In 1992 GSA issued a regulation on energy management of motor vehicles in the federal fleet to assist federal agencies that operate 300 or more vehicles to reduce gasoline and diesel consumption by 10 percent by fiscal 1995 in comparison to fiscal 1991. The regulation also mandates the use of a modified life-cycle costing formula when evaluating bids for passenger vehicles and light trucks up to 8,500 pounds.

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Alternative-Fuel Vehicles

In 1992 the General Services Administration brought 3,287 original-equipment-manufacturer alternative-fuel vehicles (AFVs) into the GSA federal fleet. Other federal agencies also purchased AFVs in compliance with the Alternative Motor Fuel Act of 1988, the Clean Air Act Amendments of 1990, and the 1991 Executive Order on Federal Energy Management. Federal agencies plan to purchase an additional 5,000 AFVs by the end of fiscal 1993, to have more than 20,000 federal AFVs operating in 1995, and to have half of all federal vehicles AFVs by 1998.

The U.S. Government is moving forward with its alternative fuels vehicle program to meet demands for national energy security and reduced emissions. The federal presence helps stimulate the market and establish the groundwork for state and private sector participation in years to come.

Led by the U.S. Postal Service, which operates the nation's largest fleet of AFVs, federal agencies are purchasing vehicles fueled by methanol, compressed natural gas, ethanol, and electric power. The U.S. Postal Service will begin testing electric-powered vehicles in 1993. In 1991-1992 GSA purchased the following AFVs:

- **Methanol Flexible Fuel.** GSA purchased 2,500 methanol flexible fuel compact sedans from Chrysler Corporation and 25 methanol flexible fuel vans from Ford Motor Company in 1992. These vehicles, which operate on methanol (M85), unleaded gasoline, or any combination of the two, will be operating in numerous locations nationwide. GSA previously had 65 methanol flexible fuel sedans in its fleet.
 - **Compressed Natural Gas (CNG).** GSA purchased 600 CNG three-quarter ton pickup trucks from General Motors and an additional 25 CNG 8-passenger vans from Chrysler Corporation in 1992. These CNG vehicles will be added to the GSA fleet of 52 8-passenger CNG vans, which are operating throughout the nation.
 - **Ethanol Flexible Fuel.** GSA has 25 ethanol flexible fuel General Motors sedans operating in Washington, D.C., and Chicago. These sedans operate on ethanol (E85), unleaded gas, or any combination of the two.
-

Recycling. In 1991 GSA implemented recycling in 345 buildings owned by the U.S. Government nationwide, involving the participation of 400,000 federal employees, recovery of 22,000 tons of recyclable materials, and generation of \$500,000 through sales contracts. Reduction in handling and dumping fees resulted in savings of \$1 million. In 1992 the programs expanded to 728 buildings owned and leased by the U.S. Government with 500,000 federal employees participating. In addition to recycling wastepaper, GSA is composting vegetative materials and recovering items such as copper wire, carpet, ceiling tile, paint, cardboard, telephone books, and glass and plastic food and beverage containers. In 1992 the program recovered 36,000 tons of material, which represents a 63-percent increase over fiscal 1991.

Recycled Products. To stimulate the U.S. market for recyclables, GSA procured 168,000 tons of recycled content paper and paper products in 1992, including paper towels, toilet paper, cardboard boxes, stationery items, and file folders. GSA awarded 271 contracts for 802 recycled-content paper and paper products totaling \$169 million--a third of all paper supplied by the agency. Committed to products with high percentages of post-consumer recovered material, GSA stocked scores of products that exceed guidelines issued by EPA under RCRA. For example, in 1992 GSA introduced as a stock item recycled-content copier paper that is not required by the EPA guidelines. The paper contains 50-percent recycled content, including 10-percent post consumer-recovered material.

Other recycled products include retread bus and truck tires, thermal building insulation products containing from 9 to 50 percent recovered materials, recycled wiping rags, recycled toner cartridges used in office equipment, and recycled paint. In fiscal 1991 GSA awarded 70 contracts for retread bus and truck tires valued at \$200,000; in fiscal 1992 the numbers increased to 232 contracts valued at \$650,000. Remanufactured toner cartridges that reduce disposal and save 50 percent in replacement costs have resulted in savings for federal agencies of \$2 million since 1990.

In 1991 GSA highlighted environmentally sound products in two publications: GSA Recycled Products Guide, which lists

recycled products available from GSA supply sources and provides a means for agencies to identify and purchase recycled products; and GSA Supply Catalog, which highlights stock items with recycled content. In 1992 GSA expanded the catalog to include 2,100 environmentally sound products, such as lead-free, energy-saving, and water-saving items.

Chlorofluorocarbon Reduction. To meet requirements of the Clean Air Act, GSA is eliminating the use of products containing ozone-depleting chemicals. Federal facilities are reducing the use of chlorofluorocarbons (CFCs) in their operations, and they are servicing vehicles in the federal fleet to capture CFCs. After eliminating aerosol paints that used CFCs as a propellant 15 years ago, GSA now has eliminated plastic foam cups manufactured with CFCs. Halon fire extinguishers also are no longer in the federal supply system.

Energy Efficiency. In 1992 GSA continued to develop and implement projects to reduce energy use in buildings owned, operated, and leased by the U.S. Government. In fiscal 1990 GSA spent \$10 million on 90 energy conservation projects; in fiscal 1991 those figures had increased to \$30 million for 320 projects. In fiscal 1992 GSA approved an additional \$37.5 million for 209 projects that include retrofitting existing lighting systems, installing motion sensors to control lighting, installing energy efficient motors, installing improved windows, installing energy management and control systems, and replacing heating/

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ventilation/air conditioning systems. The GSA energy program has
reduced energy consumption by 6 percent since 1985.

Department of the Interior

In 1992 the Department of the Interior (DOI) expanded a
paper recycling initiative at its Washington, D.C., headquarters
to include colored paper, newspaper, cardboard, aluminum cans,
and glass containers. Through July 1992 DOI headquarters had
collected 466.5 tons of high grade white paper, 126.6 tons of
grade 2 colored paper, 96.9 tons of newspaper, 50.2 tons of
cardboard, 6.3 tons of aluminum cans, 18.5 tons of glass, and
20.5 tons of scrap metal. The paper collection alone represents
an estimated savings of 2,443 cubic yards of landfill space,
12,583 trees, and 5.2 million gallons of water.

As an additional benefit, the frequency of trash collection
and associated landfill costs have been reduced for an estimated
annual savings of \$63,000. Under the President's Partnership in
Education program, DOI donated \$942 in proceeds from the
collection of aluminum cans and glass containers to its adopted
elementary schools in the area to purchase needed supplies and
materials.

Department of Defense

The Department of Defense is committed to becoming a leader
in environmental compliance. A summary of DOD efforts in

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environmental restoration and pollution prevention follows. For more information, see the Department of Defense section.

Environmental Restoration. The DOD Environmental Restoration Program (DERP) operated on a budget of \$1.5 billion, up from \$1 billion in fiscal 1991. The Department of Defense improved program management, accelerated characterizing contaminated sites, and developed cost-reduction initiatives for a comprehensive restoration strategic plan to be completed by 1995. DOD has 1,800 installations in need of cleanup, of which 90 are on the National Priorities List (NPL). Preliminary assessments are complete for all of the Department's NPL sites, and 180 individual remedial actions are in process. At one-third of all DERP sites, environmental restoration is complete.

Pollution Prevention. The DOD pollution prevention strategy emphasizes systems acquisition, material substitution, process improvement, improved hazardous materials management, and alternative energy sources. By instituting control measures, DOD has reduced hazardous waste disposal by over half since 1987. This reduction proceeded despite the increased production and maintenance related to Operation Desert Shield/Desert Storm.

Department of Energy

In 1992 the Department of Energy implemented programs that stress the compatibility of environmental protection and energy production. In addition, DOE had two major efforts underway to

U.S. budget for cleanup of federal facilities.

Federal facility	1989	1992	1993	1992-1993 Change	
	Actual	Enacted	Proposed	Dollar	Percent
			<i>million \$</i>		<i>%</i>
Department of Energy	1,762	4,407	5,534	+1,127	+26
Department of Defense	1,155	2,761	3,718	+957	+35
Department of Agriculture	8	38	39	+1	+3
Department of the Interior	41	70	80	+10	+14
Department of Transportation	29	54	59	+5	+9
NASA, DOJ, and DOC	28	41	58	+17	+41
Total	3,023	7,371	9,488	+2,117	+29
DOD 1992 anticipated supplemental	—	1,034	—	N/A	N/A

Source: Executive Office of the President, Office of Management and Budget, *Budget of the U.S. Government*, (Washington, DC: U.S. Government Printing Office, 1992).

To be updated.

improve management of the U.S. nuclear weapons program, which it has supervised for the past 30 years. The agency also proceeded with plans to manage the nuclear waste generated by commercial nuclear energy plants. For more information, see the Energy section.

Waste Minimization. In May 1992 DOE introduced a plan to coordinate waste minimization at its facilities. Objectives include creating a Department-wide bias for conserving resources and minimizing wastes, identifying waste minimization options and technologies, and incorporating waste minimization principles in design, development, and production.

Industrial Toxics Program. DOE participated in the EPA voluntary Industrial Toxics Program, called the 33/50 Program for its goal of reducing releases of 17 priority chemicals by 33 percent by the end of 1992 and by 50 percent by the end of 1995.

Internal Audit Programs. The DOE environmental assessment program identifies effectiveness, strengths, weaknesses, root causes of weaknesses, corrective actions, and lessons learned. Such assessment provides the foundation for efficient and cost effective management planning.

Nuclear Weapons Complex Reconfiguration. To consolidate and modernize existing facilities, DOE issued a Reconfiguration Study in January 1991. The study included plans for constructing and operating a reorganized complex in compliance with federal, state, and local environmental laws. To comply with the National

Environmental Policy Act (NEPA), DOE is preparing an environmental impact statement (EIS) on the reconfiguration plans--to be completed in 1994. The EIS will analyze the environmental consequences of alternative configurations of the nuclear weapons complex.

Environmental Restoration and Waste Management. In August 1992 DOE issued the fourth annual update of its Environmental Restoration and Waste Management Five-Year Plan. The objectives are to achieve timely compliance with environmental requirements and to complete cleanup of the 1989 inventory of inactive DOE sites and facilities by the year 2019. DOE is preparing a programmatic EIS, also scheduled for completion in 1994, to analyze potential environmental impacts of cleanup and compliance at all of its sites. The DOE budget for environmental restoration and waste management has increased from \$2.3 billion in fiscal 1990 to \$4.8 billion approved for fiscal 1993.

In 1992 DOE began using environmental restoration management contractors to clean up radioactive and hazardous contamination at its facilities. Remediation contractors manage site investigation, cleanup, decontamination, and decommissioning. DOE awarded an environmental restoration management contract in 1992 for the cleanup of its Fernald, Ohio, site.

Permanent Nuclear Waste Repository. As directed by the Nuclear Waste Policy Act (as amended in 1987), DOE is investigating the suitability of Yucca Mountain in southern

Nevada for a permanent nuclear waste repository. The site is under consideration for the safe disposal of high-level radioactive waste from commercial nuclear powerplants. Establishment of a permanent repository could help resolve the issue of nuclear waste disposal.

Resolution of a 3-year legal dispute allowed DOE to resume site characterization studies with three environmental permits from the State of Nevada. These studies, to be completed before 2001, will determine whether the geology and hydrology of Yucca Mountain will allow for permanent disposal of nuclear wastes. Progress continued on surface testing, development of specialized drilling equipment, and design of an underground exploratory studies facility to ascertain the geological characteristics of the site. In this pioneering effort, DOE, the Nuclear Regulatory Commission, and the Congressionally designated Nuclear Waste Technical Review Board worked together to assure that planning accords with scientific review and high standards of nuclear safety.

Monitored Retrievable Storage. To facilitate DOE acceptance of commercial spent nuclear fuel by 1998, the Department has planned for a monitored retrievable storage (MRS) facility for temporary above-ground storage of nuclear waste. To date, a designated DOE nuclear waste negotiator has received 20 applications from municipalities and Indian tribes for grants to study the hosting of an MRS site. The Department expects to

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select an MRS site in 1993. In addition, federal and state efforts continue toward the siting of low-level radioactive waste disposal facilities, as mandated by the Low-Level Radioactive Waste Policy Amendments of 1985. Numerous interstate compacts for developing facilities for waste generated within the borders of a state are in effect.

FISHERIES AND MARINE MAMMALS

Also see Coasts and Oceans, Wetlands, International Issues, and related tables and figures in Part II.

U.S. marine fisheries represent a valuable national asset. Commercial and recreational fishing and associated enterprises contribute \$24 billion annually to the U.S. economy. The U.S. Exclusive Economic Zone (EEZ)--at 2 million square miles, the largest of any nation--supports diverse and abundant living marine resources that provide rich economic as well as cultural and other quality-of-life benefits.

Conditions and Trends

The National Marine Fisheries Service (NMFS) reports that in 1991 commercial fishermen landed 9.4 billion pounds of fish and shellfish in U.S. waters worth \$3.3 billion at dockside. U.S. exports of edible domestic fishery products totaled a record \$3 billion. Alaskan pollock was the leading species in terms of quantity, and shrimp was the most economically valuable species.

The 1991 NMFS report, Our Living Oceans: The First Annual Report on the Status of U.S. Living Marine Resources documents a recent decline in marine species, including fish, shellfish, marine mammals, and sea turtles. The cause of decline is a combination of fishing-related pressures and habitat loss or degradation. Among U.S. fishery stocks, 52.6 percent are fully or over utilized, and only 13.4 percent are under utilized. For 34.1 percent of fishery stocks in U.S. waters, too little information is available to make any determination regarding

Historically Low Populations

Populations of many recreationally and commercially valuable fish are at historically low levels. Populations of New England groundfish, the most valuable component of the region's fishery, are down to 45 percent of their estimated long-term potential. Many Pacific salmon, a symbol of the nation's rich natural heritage, are near extinction. The American Fisheries Society reports that at least 106 stocks of west coast salmonids are extinct and 214 others are at risk. Four stocks are presently listed as threatened or endangered under the Endangered Species Act (ESA). Present numbers of Atlantic bluefin tuna, which may have a value of \$94 dollars per pound or \$67,000 for a single large fish, are only 10 percent of what they were 20 years ago.

Declines such as these can profoundly affect local economies and regional ecosystems. For Massachusetts alone, recent all-time low landings of groundfish translate into annual losses of 88 million pounds or \$193 million and 8,000 jobs, when compared to the estimated long-term potential. For all of New England, groundfish losses represent 137 million pounds or \$350 million and 14,000 jobs.

The major factors contributing to the declines in marine species include overharvesting, bycatch waste, habitat degradation, and, in the case of marine mammals, fishery/marine mammal interactions.

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Causes of Declines in Marine Species

In waters managed by the United States, recent declines in marine species are attributable to the following causes:

o **Overharvesting.** The removal of fish in such quantities that populations are unable to replace themselves depletes fisheries stocks. Increased domestic fishing operations are a major cause of declines in U.S. fishery stocks. Contributing factors are increased efficiency in fishing technology, overcapitalization of the fishing industry, unlimited access to fisheries, and noncompliance with fishery management regulations.

o **Bycatch waste.** Inadvertent capture of nontarget and undersized marine species occurs in most fisheries. Fishermen return bycatch to the water but the animals rarely survive. Impacts are significant especially when bycatch would have commercial or recreational value at larger sizes. Shrimp fishermen discard nine pounds of potentially valuable juvenile fish for every pound of shrimp harvested. Fisherman also discard economically valuable species to comply with quotas or other conservation regulations. In New England, 90 percent of yellowtail flounder and cod catches consist of noncommercial sizes lost as potential future catch. Mortality of marine mammals and endangered species such as sea turtles trapped or entangled by fishermen is also a serious bycatch problem.

o **Habitat Degradation.** The loss or degradation of habitat critical to various life stages, particularly reproductive and juvenile stages, of marine life threatens the future viability of U.S. fisheries. Among the nation's commercially and recreationally valuable species, 75 percent depend on coastal estuaries where impacts of development and pollution may render habitats inadequate. Fully 90 percent of the Gulf coast fishery is critically dependent on estuaries and coastal wetlands. Physical alteration of and lack of access to spawning habitat have profound implications for anadromous salmon stocks. Hydroelectric dams, freshwater diversions for irrigation, and habitat degradation from logging and development have led to the listing of four west coast salmon stocks under the ESA; several other stocks face a similar fate.

o **Interactions between Fisheries and Marine Mammals/Sea Turtles.** Fishing operations can directly disturb marine mammals and sea turtles by harassing, injuring, or killing them. These animals may become trapped or

entangled by fishing gear, leading to injury or death as well as damage to fishing equipment. In 1989 NMFS initiated a fishery-wide observer program to collect information on the incidental take of marine mammals in commercial fisheries. Indirect interactions may occur as marine mammals compete for the same fish and shellfish resources as commercial or recreational fishermen. Along the north Atlantic coast, harbor seals are known to remove bait from lobsterpots and eat pen-raised salmon. In the commercial fisheries for pollock and other groundfish in Alaska, fisheries interactions are a contributing factor in the decline of threatened Steller sea lion populations. In addition to being caught in nets and shot by fishermen, the sea lions may be facing a decline in food supplies in the fisheries.

Intensive fishing operations affect more than the abundance of targeted stocks. The functioning and balance of the marine ecosystem can be profoundly impacted. Overharvest of New England groundfish has resulted in steady declines in the abundance of the principal groundfish and flounder species. These declines have been accompanied by steady increases in the numbers of skates and dogfish that inhabit the same ecological niche but have no commercial value.

Removal of large quantities of historically dominant and commercially valuable groundfish has shifted the relative abundance of different species in the ecosystem. The feasibility of rebuilding groundfish and flounder stocks will depend upon the extent to which these species have been displaced by now dominant skates and dogfish.

Marine Mammals

Of 100 species of marine mammals worldwide, 58 are found in U.S. waters, and of these, 13 are listed as threatened or endangered under ESA. The status of most marine mammal stocks is uncertain because of a lack of information. The U.S. Marine Mammal Commission administers a research program to fill these information gaps. Established by the Marine Mammal Protection Act of 1972, the commission reviews federal policies and actions for their impact on marine mammals.

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Marine Mammals in Urgent Need of Protection

In 1992 the U.S. Marine Mammal Commission reported the following species in most urgent need of protection:

o **Northern right whale.** The most endangered marine mammal in U.S. waters, this species is also the world's most endangered large whale. The largest known population, estimated at 350 animals, occurs in coastal waters off the east coasts of Canada and the United States. After being devastated by commercial whaling in the last century, populations now represent 5 percent of estimated pre-commercial exploitation levels. Today, entanglement in fishing gear and collisions with ships may be the principal human-related causes of mortality and injury. In the eastern Pacific Ocean only seven sightings of right whales have been made in the last 25 years, indicating critically low numbers.

o **Hawaiian monk seal.** The most endangered seal in U.S. waters may number as few as 1,500 animals, inhabiting the remote northwestern Hawaiian Islands. Interactions with the Hawaiian swordfish industry, which has expanded from 50 to 150 vessels, are believed to be contributing to declines in births and beach counts.

o **West Indian manatee.** Occurring in the coastal waters and rivers of Florida and Georgia, the long-term survival of this population of 1,800 animals is in doubt. Known deaths between 1988 and 1991 exceeded 550, of which over 150 were caused by water craft. Habitat degradation due to coastal development may pose the more serious long-term threat to this species.

o **Steller sea lion.** Declines in the number of Steller sea lions, throughout their range but particularly in Alaska, resulted in their being listed in 1990 as threatened under the Endangered Species Act. Fisheries interactions appear to be a contributing factor. Declines of 90 percent have been recorded for major rookeries over the past 30 years, with the greatest losses occurring in the last decade. Likely causes of declines include incidental take by trawl fisheries with over 20,000 sea lions taken between 1966 and 1988, commercial exploitation of sea lion prey species (principally pollock), and shooting by fishermen attempting to protect their gear or catch.

o **California sea otter.** Numbering around 1,900 animals, the remaining population of sea otters along the central California coast continues at risk and is listed as threatened under ESA. Incidental takes in gillnets, a contributing factor in the decline, were stopped by state actions that prohibit the use of gillnets in sea otter habitat; numbers appear to be increasing.

Policies and Programs

The federal agencies with major responsibility for living marine resources, including anadromous fishes--those that travel between fresh and salt water--are the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service in the Department of Interior (FWS), and the U.S. Coast Guard in the Department of Transportation which shares enforcement responsibilities at sea.

National Marine Fisheries Service

NMFS has primary responsibility for stewardship of the nation's living marine resources, including most marine mammals. NMFS is part of the National Oceanic and Atmospheric Administration (NOAA) in the U.S. Department of Commerce. It

oversees the economic welfare of U.S. fisheries as well as the biological health of the marine life and habitat on which these fisheries depend.

Fishery Management Plans. The Magnuson Fishery Conservation and Management Act provides for the conservation and management of all fishery resources within the U.S. Exclusive Economic Zone. The Act created eight Regional Fishery Management Councils, whose members represent NMFS, the fishing industry, and affected states. The Fish and Wildlife Service is a nonvoting member of each council, and the Coast Guard advises on enforceability of proposed regulations. The Councils are charged with preparing Fishery Management Plans (FMPs) and in 1992 the National Marine Fisheries Service reported 32 FMPs in place.

Strategic Plan. NMFS has adopted a 5-year strategic plan which reflects its commitment to addressing the problem of declining stocks of marine species. The plan includes the following priority items:

- o Rebuild overfished marine fisheries,
- o Maintain currently productive fisheries,
- o Advance fishery forecasts and ecosystem models,
- o Integrate conservation of protected species and fisheries management,
- o Improve seafood safety,
- o Protect living marine resources habitats,
- o Improve the effectiveness of international fisheries relationships, and
- o Reduce impediments to U.S. aquaculture.

Controlling Harvest. Until recently efforts to control total harvests have been based on regulations that decrease overall fishing efficiency: trip limits, size limits, gear restrictions, quotas, and seasonal and area closures. NMFS and the management councils are now considering limiting access to some fisheries. Historically U.S. fisheries have been managed as open-access resources in which anyone may fish. Under this system, as new fisheries have opened and fishing technology has improved, fishermen have received substantial returns, encouraging more fishermen to enter the fishery. As a result, total harvests have approached or exceeded the maximum that many fisheries can support, leading to increased competition among fishermen as each receives a smaller share of the declining resource. Fishermen have responded by investing in more efficient and more costly technology, which compels them to seek larger catches to remain economically viable.

Under controlled access systems, eligible fishermen could be guaranteed rights to a predetermined percentage of the total allowable catch, thereby eliminating competition among fishermen for the same resource. Schemes range from a simple moratorium on additional entries to a fishery, to an Individual Transferable Quota (ITQ) system. ITQ allows fishermen to own quotas in a fishery and to trade, sell, or buy them. In 1992 NMFS used controlled access to manage seven different U.S. fisheries and proposes its use in four additional ones.

Habitat Restoration. For Pacific Northwest salmon stocks, habitat degradation, rather than overharvesting, is the primary

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issue. The American Fisheries Society has identified 101 stocks
at high risk of extinction, 58 at moderate risk, and 54 stocks of
special concern. Four are listed under ESA as threatened or
endangered. These populations have been most seriously impacted
by human activities occurring in and along the rivers in which
the fish spawn. Hydropower generation, logging, mining,
agriculture, and urban growth block the passage of migrating
fish, alter or destroy spawning habitats, and degrade water
quality.

Restoring degraded habitats is complicated by the number of
parties with a direct stake in such efforts. Maintaining
adequate river water quantity and quality for anadromous fish
requires coordination at the watershed level, with the
involvement of federal, state, and local governments, water and
power authorities, the timber industry, farmers, developers,
private landowners, conservation groups, native American tribes,
and recreational and commercial fishermen.

Under the Fish and Wildlife Coordination Act, federal
agencies are required to consult NMFS on proposals that could
affect U.S. waters essential to living marine resources. These
include waters within the EEZ, under state jurisdiction, and
throughout the migratory and spawning range of anadromous fish.
NMFS provides advice and recommendations to agencies on potential
adverse affects of proposed actions on fish habitat.

Protected Species. NMFS manages protection programs for
marine mammals, with the exception of polar bears, sea otters,
manatees, walrus, and dugongs, which come under the jurisdiction

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of the Fish and Wildlife Service. All marine mammals receive protection under the Marine Mammal Protection Act, and some receive further protection under the Endangered Species Act. In addition, the International Whaling Commission (IWC) oversees the management and conservation of large whales, most of which are listed as threatened or endangered. NMFS and the Marine Mammal Commission provide technical advice to the U.S. Commissioner to the IWC, who is also the NOAA administrator. Under the Endangered Species Act, NMFS also manages six species of sea turtles federally listed as threatened or endangered.

International Aspects

The migrations of commercial species such as yellowfin tuna, anadromous Atlantic and Pacific salmon, and Central Bering Sea pollock, have international implications. The conservation and management of such fish and of many marine mammals require high seas fishery management that neither the United States nor any other nation can address alone.

Atlantic Salmon. At the 1992 annual meeting of the North Atlantic Salmon Conservation Organization (NASCO), the United States announced a long-term policy to curtail ocean commercial interceptory fisheries for Atlantic salmon--fisheries that target migrating Atlantic Salmon in the high seas. The NASCO Council approved a protocol to the Convention on Conservation of Salmon in the North Atlantic, calling upon countries that are not parties to the convention to prohibit their fishermen from fishing for Atlantic Salmon stocks beyond their own EEZs.

Tuna-Dolphin. The United States also is participating in international efforts to reduce the incidental take of marine mammals in high seas fisheries. In June 1992 the United States and nine other nations adopted a multilateral Dolphin Conservation Program for the Eastern Tropical Pacific Ocean. In this area, yellowfin tuna and dolphins swim together, and, over the past three decades, large numbers of dolphins have been killed in purse-seine tuna fishery operations. The agreement establishes a strict schedule to reduce mortality to 5,000 dolphins by 1999, which is less than one-tenth of 1 percent of the estimated dolphin population in these waters. The conservation program includes a research component to develop techniques for catching yellowfin tuna without harming dolphins.

High Seas Driftnets. Driftnet fishing on the high seas contributes to the waste and incidental take of many species of fish, marine mammals including large whales, and seabirds. In December 1991 the United States cosponsored a U.N. General Assembly resolution calling for a moratorium on driftnet fishing. The moratorium took effect on December 31, 1992.

U.N. Conference on Environment and Development. UNCED addressed high seas fishing issues in Agenda 21, a document intended to provide guidance for setting a course to sustainable development. In the chapter on oceans, the United States supported language to ensure that populations of marine species are maintained at healthy levels, that populations of marine mammals are protected, and that fishing gear minimizes the incidental catch of non-target species. Following UNCED, the

U.N. General Assembly adopted a resolution endorsing an intergovernmental conference on high seas fishing issues to be held in late 1993. The United States is cooperating with the U.N Food and Agricultural Organization (FAO) and the Organization of Economic Cooperation and Development (OECD) to address conservation as well as trade questions pertaining to high seas fishing.

U.S. Fisheries

Fishery	Quantity	Value
Alaskan pollock	First	Fourth
Menhaden	Second	Low
Salmon	Third	Third
Crabs	Fourth	Second
Cods	Fifth	Sixth
Flounders	Sixth	Eighth
Shrimp	Seventh	First
Lobsters	Low	Fifth
Scallops	Low	Seventh

Source: National Marine Fisheries Service, Fisheries of the United States, (Washington, DC: Department of Commerce, NOAA/NMFS, May 1992).

Regional Fishery Management Councils

Fishery	States
New England	Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut
Mid-Atlantic	New York, New Jersey, Delaware, Pennsylvania, Maryland, and Virginia
South Atlantic	North Carolina, South Carolina, Georgia, and Florida
Gulf of Mexico	Texas, Louisiana, Mississippi, Alabama, and Florida
Caribbean	Virgin Islands and Commonwealth of Puerto Rico
Pacific	California, Washington, Oregon, and Idaho
North Pacific	Alaska, Washington, and Oregon
Western Pacific	Hawaii, American Samoa, Guam, and Northern Mariana Islands

FORESTRY

Also see Biodiversity, International Issues, Public Lands, and related tables and figures in Part II.

Forests are the source of ecological services and economic goods--from soil and watershed protection to timber and fuelwood to carbon sequestration, wildlife habitat, and recreation. The ecology and economics of the forest cannot be separated, since forest values are at once local, national, and global in scope. In 1992, in the midst of heightened domestic and international debate about forests, the U.S. government adopted a philosophy of ecosystem management and led the way in calling for global forest conservation.

Conditions and Trends

The call to conserve and sustain forests is urgent because forests of many types are under stress around the world. Forest conversions on private lands are a trend both at home and abroad.

U.S. Forests

Forests currently occupy about a third of the nation's land area. Forest types vary from sparse scrub forests of the arid interior West to the highly productive forests of the Pacific Coast and the South. The majority of U.S. forestlands, about 525 million acres, are in state and private ownership, with the balance in

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federal forests. Most eastern forests are in state or private ownership, and western forests are divided about equally between the federal government and other owners.

Americans reforested 2.9 million acres of public and private forestland in fiscal 1991, near record highs, and a comparable acreage was regenerated naturally. On managed acres, forest growth currently exceeds harvests by 37 percent, up threefold over the 1920s, but the nation continues to lose half a million acres of private forestlands per year because of conversions to such uses as urban expansion and agricultural crops. At this rate, total U.S. forests could decrease from 731 million acres in 1992 to 703 million acres in 2040, a 4-percent decline.

Reforestation can compensate for conversions, restore ecosystems, create productive plantations, and protect watersheds, soil, and crops. The number of trees planted in 1991 was the seventh highest of any year in U.S. history. Of acres planted in trees, 82 percent were on private lands, and of these, 39 percent had nonindustrial private owners.

U.S. forests, on the whole, are healthy, but problems arise, especially on managed forests, in response to stresses such as insects and drought. In some managed forests, fire suppression and lack of thinning have resulted in stands poorly adapted to the site, prone to insect and disease problems, and stressed by drought. Potential for catastrophic wildfire is high because of the accumulation of dead and dying vegetation.

Throughout the nation, forest pests are causing serious damage. The European gypsy moth defoliated 4 million acres in 14 states in 1991, affecting the health of oaks and associated species. The Southern pine beetle reached epidemic levels in 7 states and threatened timber, wilderness values, and habitat for the endangered red-cockaded woodpecker. The Douglas-fir tussock moth and western spruce budworm were at outbreak levels in the Pacific Northwest. Root diseases and dwarf mistletoes in the West, fusiform rust in the South, and dogwood anthracnose in the East and South cause concern.

International Forests

According to a 1990 estimate by the U.N. Food and Agriculture Organization, tropical forests are disappearing at a rate of 17 million hectares (42 million acres) a year. Responding to population pressures and widespread poverty, many nations provide incentives for forest conversion to farmland and pasture. Other causes include destructive logging practices, overharvesting of commercial forests, subsidized timber sales, and large-scale development projects such as hydropower and mining.

Temperate and boreal forests, although expanding in some areas, are substantially degraded in other areas because of factors affecting forest health that include air pollution, inefficient harvesting, and lack of reforestation. In some parts of Eastern Europe, forest dieback caused primarily by air pollution is as high

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as 50 percent. In 1992, however, the general condition of European
forests showed an improvement over recent years.

Policies and Programs

The federal forestry program, with both domestic and international components, is conducted primarily by the Forest Service in the Department of Agriculture, the Department of the Interior (DOI), the Department of Defense (DOD), and the U.S. Agency for International Development (USAID).

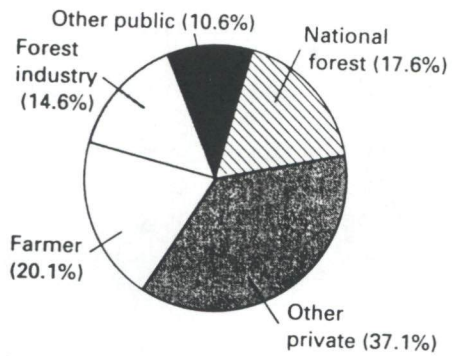
U.S. Forestry

In 1992 the DOI Bureau of Land Management and the USDA Forest Service announced complementary forestry initiatives based on ecosystem management.

National Forests. In response to new scientific information and mounting public opposition, the Forest Service announced in June 1992 that it will phase out clearcutting as a standard practice on the national forests. As part of its new ecosystem management philosophy, the agency will make greater use of other harvesting methods to provide more visually pleasing and ecologically sensitive forest management. The Forest Service will allow clearcutting only in situations where it best accomplishes specific objectives of the forest plan.

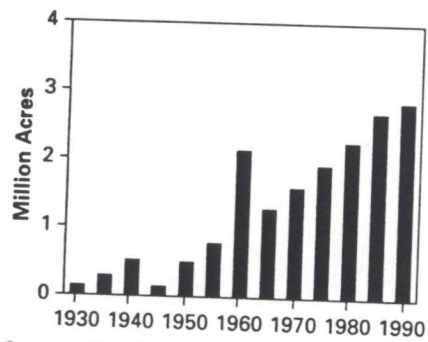
- **Reforestation.** In 1991 the national forests set a reforestation record with 503,000 acres reforested by

Timberland in the United States by ownership.



Note: Data is for 1987.
Source: See Part II, Table 57.

Reforestation in the United States.



Source: See Part II, Table 61.

To be updated.

planting, seeding, or natural regeneration. The Forest Service planted over 50 species of trees, many of genetically improved stock, to maintain vegetation diversity. Sites included timber sale harvest areas and areas devastated by natural catastrophes such as fires, insects and disease, and windstorms.

- **Timber.** National forests contain 47 percent of the nation's standing softwood sawtimber inventory, but, in addition to timber, these forests provide wilderness, wildlife, watersheds, and recreation. Recent Forest Service planning documents identified recreation as the fastest growing use of national forests in the 1990s. The Forest Service conducts harvesting, where permitted, in an environmentally sensitive manner to maintain long-term health and productivity. In fiscal 1991 national forests contributed 19 percent of the nation's total softwood sawtimber volume used for lumber, up from 13 percent in fiscal 1986.

In fiscal 1991 the Forest Service sold 6.4 billion board feet of timber, down a billion board feet from recent years. The decrease in volume reflected, in part, management concerns relating to biodiversity and the maintenance of old-growth forests and other habitat for endangered species. As of August 31, 1992, with 80 percent of the year's data in, national forest timber

harvests had produced gross revenues to the national treasury of \$985 million and net revenues of \$326.7 million.

- **Forest Fire Behavior.** To combat catastrophic forest fires, the Intermountain Fire Science Laboratory in Missoula, Montana, developed a prediction system for extreme fire behavior that resulted in more effective use of fire suppression to protect human life, property, and natural resources. The lab is a unit of the Intermountain Forest Experiment Station in Ogden, Utah.

Interior Forestlands. DOI manages 125 million acres of forestland, with objectives that reflect the different missions of the National Park Service (NPS), the Fish and Wildlife Service (FWS), the Bureau of Land Management (BLM), and the Bureau of Indian Affairs (BIA).

- **National Park Service.** National parks contain 37 million acres of forestland, managed solely for preservation with no commercial timber operations.
- **Fish and Wildlife Service.** National wildlife refuges contain 18 million acres of forestland managed for a diversity of indigenous wildlife populations. FWS allows limited commercial forestry operations, consistent with habitat objectives.
- **Bureau of Land Management.** BLM manages 48 million acres

of forestland in 12 western states and Alaska. The BLM Total Forest Management policy, adopted in June 1992, provides an ecosystem approach to timber harvesting. In addition to timber, TFM objectives achieve water quality, soil conservation, fish and wildlife habitat, old growth, aesthetics, and recreation. Clearcutting will no longer be the management tool of choice, except where it is the most environmentally effective method to achieve specific management objectives, such as rehabilitating lands affected by fires, windstorms, insects and disease, and other natural disasters. TFM is reflected in the draft 10-year Resource Management Plan for western Oregon that BLM issued in August 1992 and in guidelines for managing BLM forestlands in western states and Alaska.

In 1991 the sale of BLM forest products, including lumber, fuelwood, ferns, and mushrooms, brought \$145 million into the national treasury. Timber harvesting is restricted to about half of BLM forestlands because of wilderness designation, special study areas, sites that can be easily damaged, and sites with special wildlife and recreational values. In 1992 BLM planted 35,000 acres with 17.5 million seedlings and initiated an inventory of its forestlands in Alaska, in response to interest in expanding sustainable forest management.

- **Bureau of Indian Affairs.** BIA manages 16 million acres

of forestland in 23 states for the use and benefit of native American owners. The objective is to perpetuate economic forest products and employment opportunities as well as ecological, environmental, and biological forest values. In November 1990 President Bush signed the National Indian Forest Resources Act, culminating a joint effort by Indian tribes, the Intertribal Timber Council, the BIA Division of Forestry, and the Congress to develop a comprehensive statute for managing tribal forests.

America the Beautiful Forestry. To help meet President Bush's goal to plant and maintain a billion trees per year in urban and rural areas in this decade, the Forest Service and state foresters have established a cost-sharing Stewardship Incentive Program with the following components:

- Tree planting,
- Stabilizing eroded lands,
- Protecting riparian areas and wetlands,
- Improving wildlife and fisheries habitat,
- Enhancing forest recreation, and
- Establishing and renovating windbreaks and hedgerows.

In 1991 the program helped landowners develop 13,596 forest stewardship plans to enhance the management of natural resources on 1.4 million acres of private forestland. In 1992 an additional

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20,239 plans improved management of another 2.5 million acres. All 50 states have formed State Forest Stewardship Coordinating Committees to assist state foresters with the program. The USDA Forest Service, Soil Conservation Service, Extension Service, and Agricultural Stabilization and Conservation Service work with state foresters to provide technical assistance. Funding was \$12 million in 1991 and \$13.3 million in 1992.

Forest Legacy. The Forestry Title of the 1990 Farm Bill directed the Secretary of Agriculture to establish a Forest Legacy Program to identify environmentally valuable forestlands threatened by conversion to nonforest uses such as residential and commercial development and to protect them through voluntary conservation easements. The program protects both traditional uses of private lands and public forest values for future generations. In 1992 the Forest Service finalized guidelines to implement the program in five lead states--New York, New Hampshire, Vermont, Maine, and Washington. The fiscal 1992 appropriations bill added Massachusetts.

Forest Health. In response to a serious loss of trees from insects and disease, federal agencies have accelerated forest health programs.

- **Forest Health Monitoring Program.** In 1992 state forest resource agencies worked with the Forest Service, BLM, and EPA to monitor long-term trends in health and productivity of U.S. forest ecosystems. A monitoring

network now includes the New England states and parts of the mid-Atlantic, Southeast, and West. In 1992 these efforts focused on the condition of sugar maple trees through the U.S.-Canada North American Maple Project. When fully implemented, the Forest Health Monitoring Program will provide regional and national data on the health of all U.S. forestlands.

- **Accelerated Treatments.** In 1992 in response to tree mortality in the Blue Mountains of Oregon and Washington, the Forest Service directed \$51.5 million to national forests in the area to salvage dead and dying trees, prevent and suppress insect and disease infestations, and conduct research on pest control techniques. Similar initiatives are planned for eastern Washington, California, and the Southeast.
- **Imitating Nature.** BLM is accelerating the harvest of dead and dying trees and, with the USDA Forest Service, is evaluating tree density control by imitating natural processes of forest development, such as thinning, planting diverse species mixes, and using fire.
- **Asian Gypsy Moth.** This forest pest, native to eastern Russia, was detected in Oregon and Washington in 1991. In April and May of 1992 the USDA Animal and Plant Health Inspection Service, the Forest Service, and the states of Oregon and Washington cooperated on eradication

treatments on 124,000 acres, using a microorganism that kills the moth. A gypsy moth trapping network will monitor the success of the treatments.

- **European Gypsy Moth.** Using biotechnology, scientists at the Center for Biological Control of Northeastern Forest Insects and Diseases in Hamden, Connecticut, developed a new strain of virus that kills the European gypsy moth. Simplified procedures for commercial production will allow its widespread use as an economical, environmentally benign control agent.
- **Pest Risk of Imports.** In response to a proposal by the timber industry to import logs from Russia, New Zealand, and Chile, the Forest Service assessed larch logs from Russia and identified several serious pest risks. The Animal and Plant Health Inspection Service used the assessments to formulate measures for excluding exotic pests from U.S. forests.

Hurricane Reparations. In the aftermath of two major hurricanes in 1992, the Forest Service supplied tree-planting funds to Florida, Louisiana, and Hawaii. The agency also neared completion of reforestation efforts in South Carolina following Hurricane Hugo in 1990.

Pacific Yew and Cancer Treatment. The National Cancer Institute (NCI) describes taxol, a substance found concentrated in

the bark of Pacific yew trees, as the most promising anti-cancer agent of the last decade. However, large amounts of yew bark--up to 60 pounds from three mature trees--are needed to produce enough taxol for the treatment of one patient. Another complicating factor is the habitat of the yew--primarily federal old-growth forests slated for increased preservation in Oregon, Washington, Idaho, and California. Taxol may be approved for commercial use as early as 1993, when the demand likely will increase.

Federal agencies are cooperating to supply the taxol needed for research and treatment in an environmentally responsible manner. Recent actions included the following:

- The Forest Service implemented a cooperative agreement with the Bristol-Myers Squibb Company to ensure that bark is supplied for research, that the Pacific yew resource is managed to ensure sustainability, and that local people are involved in bark harvest;
- The Food and Drug Administration, BLM, and the Forest Service collaborated on preparation of an environmental impact statement covering a proposed 5-year program to collect Pacific yew bark for research, clinical trials, and treatment.
- BLM and the Forest Service each issued 1992 draft guidelines on managing the Pacific yew to help ensure a sustainable supply of yew for the medical community and for the continued existence of Pacific yew in the forest

ecosystem.

- The Forest Service also took the following initiatives:
 - Inventoried national forests most likely to contain Pacific yew;
 - Initiated research on the silviculture, ecology, and management of Pacific yew;
 - Worked with Congressional committees for passage of the Pacific Yew Act of 1992, which authorizes the Forest Service to negotiate yew-bark sales and use receipts to pay for the program.
- Collected 825,000 pounds of bark in 1991 on 10 national forests in Idaho, Montana, Oregon, and Washington and, as of August 1992, collected 646,000 pounds of bark for continued clinical trials.

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Old-growth Forests and the Northern Spotted Owl

In 1992 efforts to protect old-growth forests in the Pacific Northwest by reducing federal timber harvests continued to raise concern over economic impacts on small, timber-dependent communities. These forests are the habitat of the endangered northern spotted owl, and the majority of old growth remaining in the region is located on federal lands managed by the USDA Forest Service and the DOI Bureau of Land Management.

Conservation Strategy. In January 1992 the Forest Service filed a final environmental impact statement (EIS) on managing old-growth habitat, and in March the Department of Agriculture adopted the Forest Service Conservation Strategy for the northern spotted

owl, prepared pursuant to an EIS. The strategy combines old-growth preservation with methods to sustain or create old-growth characteristics for the future. Implementation of the strategy and timber sales in suitable spotted owl habitat have been stayed by federal courts pending the outcome of litigation.

Endangered Species Committee. In response to a petition from BLM, the Secretary of the Interior convened the Endangered Species Committee to consider 44 BLM timber sales in Oregon that the Fish and Wildlife Service (FWS) determined would jeopardize the existence of the northern spotted owl. The committee consists of the secretaries of the Interior, Army, and Agriculture, administrators of the National Oceanic and Atmospheric Administration and Environmental Protection Agency, chairman of the Council on Economic Advisors, and a representative from each affected state.

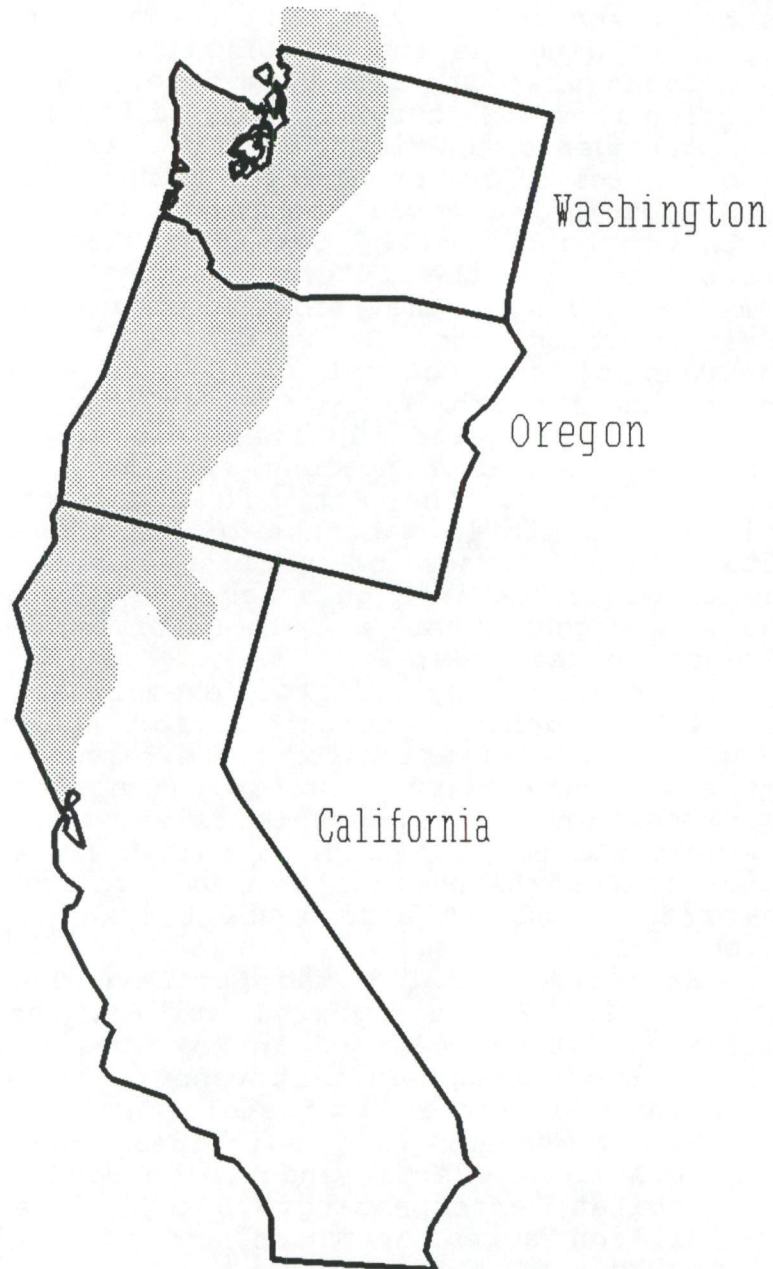
The Endangered Species Act (ESA) allows the committee to exempt actions such as timber sales from restrictions of the act, if such actions meet the following criteria: absence of reasonable and prudent alternative courses of action; regional or national significance, defined on a case-by-case basis; benefits that outweigh those of alternatives; and identified mitigation measures.

In May 1992 the committee exempted 13 of 44 proposed BLM sales, denied exemptions for the other 31, and required, as mitigation for the exempted sales, that BLM implement a recovery plan for the northern spotted owl as expeditiously as possible to serve as the basis for the next BLM 10-year plan. The 13 sales encompass 1,742 acres of forestland with a timber volume of 88 million board feet. Court action has blocked the 13 exempted sales.

Recovery Plan for the Northern Spotted Owl. In January 1992 FWS designated critical habitat for the northern spotted owl, and in May 1992 the Secretary of the Interior issued a draft recovery plan for the owl, which includes the following elements:

- A network of 196 Designated Conservation Areas (DCAs) on federal lands to be managed for owl habitat, encompassing 7.5 million acres, 2.1 million acres of which are within national parks and wilderness areas.
- Guidelines for forest management and other activities on DCAs, prohibiting commercial timber harvest in owl habitat.
- Management recommendations for federal lands outside DCAs, initially adding 410,000 protected acres.

Range of the Northern Spotted Owl



SOURCE: Redrawn from Figures C1 and C2 in A Conservation Strategy for the Northern Spotted Owl, Report of the Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl, 1990, pp. 6364.

- A set of standards for judging when the northern spotted owl has reached recovery.
- Recommendations for contributions from nonfederal forestlands to support northern spotted owl populations.
- A monitoring and research program to seek information on the owl and its habitat and to develop and test techniques for creating and maintaining owl habitat while allowing forest management.
- Mechanisms to implement the recovery plan, providing oversight and coordination.

Alternative Plan. At the same time that DOI prepared the draft recovery plan, it also prepared an alternative plan to protect owl habitat at a lower cost to the region's economy. The alternative plan would create a network of 75 DCAs encompassing 2.8 million acres of non-reserved lands and 1.5 million acres of reserved lands. Habitat in other parts of the range would not be managed with owl needs as the primary consideration. Implementation of the alternative plan would require Congressional approval, since it does not meet all the goals of the Endangered Species Act.

Resource Management Plans. Court actions also have halted BLM timber sales in western Oregon pending completion of Resource Management Plans (RMPs) for six districts. In 1992 the Bureau prepared draft RMPs and draft environmental impact statements. Based on an ecosystem approach to management, the plans will determine old-growth timber harvests for the next decade.

International Forestry

In 1992 public and private efforts were underway to promote sustainable forest management abroad, especially in developing countries. Examples follow.

USDA Forest Service. The 1990 Farm Bill authorized the Secretary of Agriculture to create, within the Forest Service, an Office of International Forestry led by a Deputy Chief. Established in June 1991, the Office of International Forestry

coordinates programs in the following areas:

- Tropical forestry technical assistance and training,
- Cooperative work with USAID,
- International scientific and technical exchanges,
- Cooperative research with other countries,
- Support to international organizations responsible for global forestry issues, and
- Operation of the Institute of Tropical Forestry in Puerto Rico as an international institution.

The Office of International Forestry administers the following programs:

- **Forestry Support Program.** In 1992 the Forest Service provided forestry technical assistance and trainers in support of 18 USAID programs, including projects in Indonesia, Costa Rica, Nicaragua, Ghana, Uganda, Panama, Haiti, Guinea, and the Sahel.
- **Tropical Forestry Program.** The Forest Service held workshops in 1992 on agroforestry and remote sensing in East Africa, Latin America, and Panama. Forest Service staff provided training and technical advice to Brazil on wildfire suppression and helped establish "Twinning Relationships" between U.S. national forests and forestry organizations in Mali, West Africa, and Costa Rica.
- **Disaster Assistance Support Program.** The Forest Service provides emergency response, preparedness, prevention,

and mitigation assistance for global disasters, including catastrophic forest fires.

- **Cooperative Research.** In 1992 Forest Service scientists participated in 11 cooperative research programs in four countries--Pakistan, Poland, the Republic of China (Taiwan), and Yugoslavia. In addition, they provided forest pest management assistance to Africa and China.

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Global Forest Protection

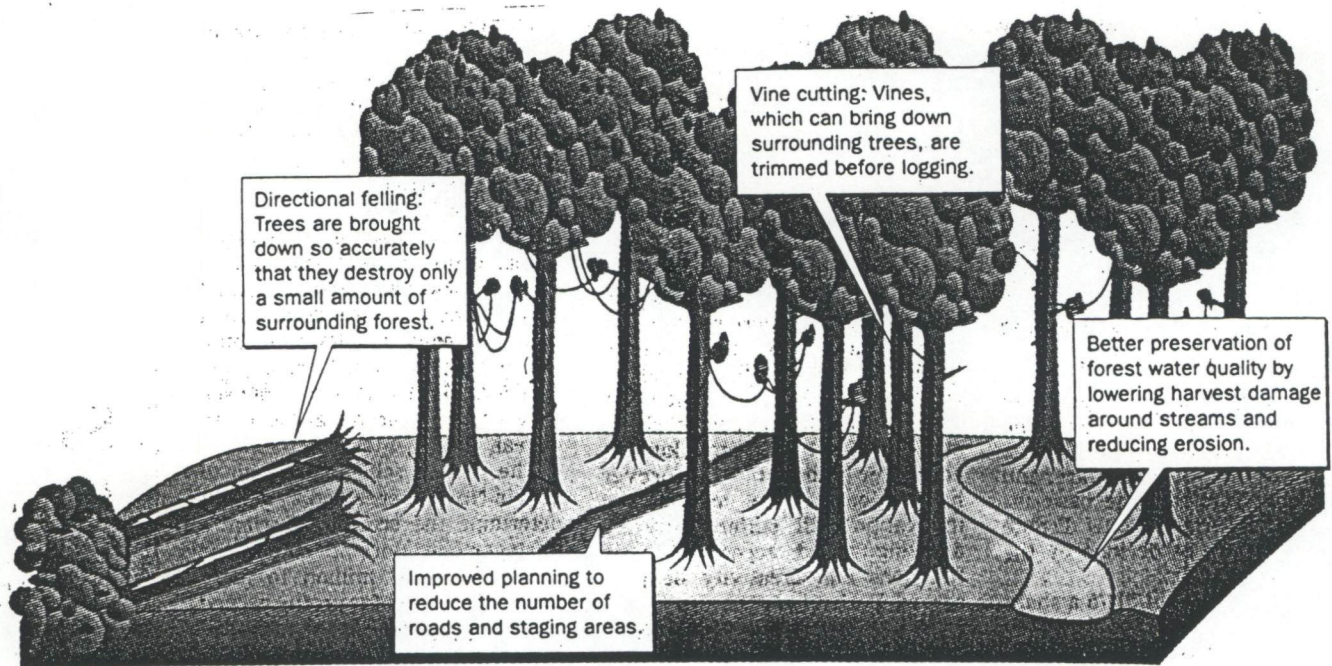
At the June 1992 U.N. Conference on Environment and Development (UNCED), President Bush and 130 other heads of state signed a "non-legally binding authoritative statement of principles for a global consensus on the management, conservation, and sustainable development of all types of forests." President Bush first called for a world forestry agreement at the 1990 G-7 summit in Houston, and the United States and other G-7 countries support the UNCED statement of principles as a first step toward a binding forest convention.

At the Rio Conference, participating nations accepted the report, Conservation and Development of Forests, by the UNCED Secretary General on conditions of world forests and threats facing them. They also adopted Agenda 21, which includes a common approach for countries to use in integrating national actions and international cooperation with forest conservation and sustainable development.

In preparation for UNCED, President Bush launched the Forests for the Future initiative, calling on the donor community to double world assistance for forests to \$2.7 billion. He pledged to increase U.S. bilateral forest assistance by \$150 million annually and endorsed a pledge of \$20 million to the Brazil Rainforest Pilot Program, an additional \$2 million for the International Tropical Timber Organization, and reform of the World Bank forestry policy.

Forestry Carbon Dioxide Offset Schemes. Several private U.S. firms are experimenting with forestry projects in developing countries to offset carbon dioxide emissions from U.S. operations. For example, in August 1992 New England Power Company and Innoprise, a major Malaysian forest products company, announced a 3-year pilot project to make logging practices less damaging to the rainforest in Malaysia. The project is part of a previously announced plan by the utility to lower or offset its greenhouse gas emissions 45 percent by 2000. By reducing the number of surrounding trees destroyed during harvesting and by enhancing forest regeneration, the foresters hope to sustain trees capable of removing 300,000-600,000 tons of carbon dioxide from the atmosphere over the life of the project--trees that otherwise would have been removed from land that would not have been reforested. The project will be monitored by the Rain Forest Alliance, a New York-based environmental group. If successful, reduced impact logging techniques could be applied to tropical hardwood rain forests in the Philippines, Indonesia, New Guinea, and other developing nations.

Reduced-impact logging techniques for tropical rainforests.



Source: Los Angeles Times, Washington Edition, Tuesday, August 4, 1992.

HAZARDOUS AND SOLID WASTES

Also see Federal Facilities Management, Pollution Prevention, Technology, and related tables and figures in Part II.

The United States has some of the world's most progressive laws regulating the handling and disposal of hazardous and solid wastes. These laws have spawned an array of complex regulations, some of which place a heavy burden on those regulated, especially small communities and businesses. In 1992 President Bush issued a directive to federal agencies to review and revise existing regulatory programs, and Congress began consideration of reforms that would achieve environmental protection with less burdensome regulatory control.

Conditions and Trends

Until 1976, when Congress passed the Resource Conservation and Recovery Act (RCRA), federal agencies had little authority to regulate hazardous and solid wastes. RCRA instituted a cradle-to-grave management system for hazardous wastes and developed disposal criteria for solid wastes, including municipal solid wastes. Over the past decade, RCRA, with its provisions for state regulation, has been joined by other federal environmental laws that authorize the Environmental Protection Agency (EPA) and the states to undertake programs to prevent pollution, manage hazardous

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wastes, clean up hazardous waste sites, ensure the safety of underground storage tanks containing petroleum or hazardous substances, and address the growing volume of municipal solid waste to ensure its safe management.

By current EPA estimates, the United States spends \$35 billion a year on the following activities:

- Managing and disposing of hazardous waste and cleaning up contamination from such wastes at hazardous waste management facilities;
- Collecting, managing, and disposing of municipal and other solid wastes; and
- Managing the underground storage tank improvement and cleanup program.

EPA estimates that these expenditures will rise to \$42 billion by the year 2000. Within this total, the cost of federally mandated activities may rise from \$15 billion in 1992 to \$20 billion in 2000. The cost of the Superfund hazardous waste cleanup program --covered by the Superfund Trust Fund and those responsible for hazardous substance pollution--may rise from \$2.5 billion in 1992 to \$7 billion in 2000.

In 1992, acting upon the Presidential directive to review and revise existing programs, the EPA Office of Solid Waste and Emergency Response (OSWER) proposed a package of reforms. To avoid regulatory relief at the expense of environmental protection, the following reforms would balance regulatory control with

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environmental risk to protect human health, the environment, and the economy:

- **RCRA Reform Initiative.** Regulatory reforms would reduce cost to industry by tailoring controls to risk and by removing certain administrative requirements;
- **Superfund Revitalization.** Reforms would improve the effectiveness, efficiency, and equity of the Superfund program, administered by EPA under the 1980 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) and the 1986 Superfund Amendments and Reauthorization Act (SARA);
- **OSWER Reforms.** The EPA Office of Solid Waste and Emergency Response would improve the responsiveness of the U.S. government to burdens placed on the regulated community by environmental laws.

Municipal Solid Waste

Regulatory reforms would promote cost-saving pollution prevention in such areas as municipal solid waste. In 1990 Americans produced 196 million tons of trash (4.3 pounds per person per day), double the amount produced in 1960. In the absence of additional actions to reduce trash, EPA estimates that the amount of garbage generated in the United States may reach 222 million tons (4.5 pounds per person per day) by 2000.

Meanwhile, the number of landfills open to receive wastes

declined from 20,000 in 1978 to 6,000 in 1986. Much of this loss came from closure of landfills or open dumps that had reached capacity or that were determined to be inappropriately designed and operated. Many of the remaining landfills may reach capacity by the mid-1990s. The nation faces the challenge of siting carefully designed landfills to provide adequate waste management capacity while protecting human health and the environment. Public opposition to the siting of new waste management facilities, expressed by "not in my backyard" sentiments, make the task more difficult.

The national trend is to reduce the amount and toxicity of wastes through such approaches as source reduction and recycling. The rate at which materials in the municipal solid waste stream are diverted for recycling or composting has risen from 7 percent in 1960 (6 million tons) to 17 percent (33 million tons) in 1990. In the late 1980s the recycling rate rose rapidly. The amount of municipal solid waste recovered for recycling and composting doubled between 1985 and 1990.

Interstate Transport of Solid Waste

Disposal of municipal and other types of solid waste across state boundaries is a contentious issue. In roughly half the states, restrictions or additional requirements on out-of-state solid waste have been enacted or proposed in recent legislative sessions. The Constitution's commerce clause, barring states from

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restricting interstate commerce without the consent of Congress, is often the basis for legal challenges to state laws impeding interstate transport of solid waste. In recent sessions of Congress, federal legislation has been proposed which would allow states to impose bans or fees on imported wastes.

Transboundary Movements of Hazardous Wastes

Regulating exports of hazardous and other wastes is an emerging trend in the international community. In 1990 the United States signed the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. In August 1992 the Senate gave consent to the U.S. ratification of the Convention, and Congress must now enact enabling legislation to allow the President to ratify. Proposed federal legislation to implement the Basel Convention would prohibit the export and import of hazardous and municipal wastes and residues from the incineration of municipal wastes, except in cases where the United States has a bilateral agreement with another country ensuring that wastes will be handled in an environmentally sound manner.

Policies and Programs

As the volume of hazardous and solid waste increased in conjunction with national growth, government agencies--federal, state, and local--have responded with a number of programs, many in partnership with private-sector groups.

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Hazardous Waste

U.S. environmental laws regulate the generation, transport, storage, treatment, and disposal of hazardous wastes. A summary follows on relevant provisions of the Resource Conservation and Recovery Act of 1976 (RCRA); the Hazardous and Solid Waste Amendments of 1984 (RCRA amendments); the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund); the Superfund Amendments and Reauthorization Act of 1986 (SARA), including the Emergency Planning and Community Right-to-Know Act; the Clean Air Act Amendments of 1990; and the Hazardous Materials Transportation Uniform Safety Act of 1990.

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What Is a Hazardous Waste?

According to the Resource Conservation and Recovery Act of 1976 (RCRA) and the Hazardous and Solid Waste Amendments of 1984, a hazardous waste is defined as "garbage, refuse, or sludge or any other waste material" including a solid, semi-solid, or liquid form or a contained gas. Regulations implementing RCRA identify wastes as being hazardous if they exhibit one or more of the following characteristics: ignitability, corrosivity, reactivity (unstable under normal conditions and capable of posing dangers), or toxicity. Also specific wastes may be determined hazardous by EPA. Improperly handled, hazardous wastes can contaminate drinking water supplies, release toxic vapors in the air, or cause explosions.

RCRA and the RCRA Amendments. The Resource Conservation and Recovery Act of 1976 (RCRA) and the Hazardous and Solid Waste Amendments of 1984 (RCRA amendments) regulate the generation, transportation, storage, treatment, and final disposal of hazardous

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and solid wastes. RCRA regulates solid wastes produced by 200,000 generators. Today many of these wastes are banned from land disposal unless treated to meet EPA standards, which require best available treatment technology--chemical or biological treatment or incineration--to reduce toxicity and stabilize residues.

- **Land Disposal Restriction.** The EPA Land Disposal Restriction Program has resulted in 42.5 million tons of hazardous wastes being treated each year prior to final disposal. Of this total, provisions of the Safe Drinking Water Act regulate 34 million tons of treated wastes pumped into the ground in underground injection wells. The remaining 8.5 million tons are disposed of in or just below the land surface in RCRA-regulated landfills, surface impoundments, and land application units.
- **Corrective Actions.** EPA can require corrective actions to address all releases of hazardous waste or hazardous constituents from any facility requiring a RCRA hazardous waste permit. Of 4,600 hazardous waste facilities subject to corrective actions, EPA estimates 3,600 will require some form of cleanup. To date, EPA and states authorized to run the corrective action program have conducted 3,000 initial assessments. Of this total, 800 facilities are pursuing corrective action under consent orders or permit requirements, and 135 facilities are conducting cleanup activities.

- **RCRA Reform.** In 1992 EPA began a major RCRA Reform Initiative that could save businesses and communities billions of dollars annually. RCRA reform has the following objectives:
 - Redirect RCRA towards higher risk wastes and cleanup activities;
 - Expedite the pace of corrective action cleanups at RCRA facilities;
 - Tailor management standards to environmental risks posed by waste management; and
 - Streamline the RCRA permit system to facilitate cleanups and hazardous waste recycling and also to address closed facilities.
- **Underground Storage Tanks.** Chemicals that escape from underground tanks containing petroleum or other hazardous substances can contaminate drinking water supplies. Fumes from these tanks can pose health hazards, fires, and explosions. The RCRA amendments require tank registration, leak detection, leak prevention, and corrective action. From 1990 through August 1992, states and private parties confirmed 167,000 releases, initiated 114,000 cleanups, and completed 45,000 cleanups. When a responsible party for a tank cannot be found to oversee corrective action, EPA authorizes 49 states, 5 U.S.

territories, and the District of Columbia to use the Leaking Underground Storage Tank Trust Fund for cleanups. As of June 1992 the Trust Fund had collected \$810 million for cleanup actions.

Superfund. CERCLA created the Superfund program to respond to a release or threatened release of hazardous substances, pollutants, and contaminants stemming from accidents or uncontrolled hazardous waste sites. Under the law, those responsible for the contamination may conduct the cleanup. Where enforcement is not successful, the federal government can clean up a site using the CERCLA Trust Fund (Superfund), which is supported largely by excise taxes on feedstock chemicals and petroleum. If the Superfund program conducts the cleanup, the government can take court action against responsible parties to recover costs, in some cases, as much as treble damages.

To accelerate responses, EPA seeks to have responsible parties begin the remedial design before entry of a consent decree. In fiscal 1991 parties responsible for contamination at nonfederal Superfund sites agreed to perform a record 63 percent of new cleanup work; in 1992 that figure was a record 72 percent. The total value of responsible party commitments to conduct site study and cleanups at Superfund sites has exceeded \$1 billion for each of the past three years. Since Superfund was created in 1980, EPA has obtained \$7 billion in site work commitments from responsible

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parties, with three-quarters of this amount obtained since 1988. Examples of recent Superfund accomplishments follow.

- **Site Evaluations.** Through September 1992 EPA had identified 37,000 potentially hazardous waste sites across the nation. Of these, 93 percent have undergone a preliminary assessment to determine the need for further action.
- **National Priorities List.** EPA maintains the Superfund National Priorities List (NPL), which identifies the nation's most seriously contaminated hazardous waste sites eligible for permanent Superfund cleanup. As of mid-November 1992 a total of 1,252 sites had been listed, on which work was underway at 95 percent and cleanup construction was in process or complete at 41 percent. In fiscal 1992 permanent cleanup construction was completed at 86 sites--a total equalling more than the number completed in the first 11 years of Superfund.
- **Environmental Progress.** To date, at 3,000 sites, the Superfund program has treated, isolated, neutralized, or removed from the environment 13 million cubic yards of contaminated soil and solid wastes; 1 billion gallons of liquid waste; 6 billion gallons of contaminated groundwater; and 316 million gallons of polluted surface water. These actions have reduced potential risks to the 23.5 million people who live within four miles of a Superfund site.

- **Superfund Accelerated Cleanup Model.** Because the number of abandoned and uncontrolled hazardous waste sites far exceeds original estimates, EPA, in fiscal 1992, developed the Superfund Accelerated Cleanup Model. This computer model, which is being tested in 27 pilot projects nationwide, has the following features:
 - A single-site assessment that eliminates redundant activities and results in earlier enforcement;
 - Regional management/decision teams to prioritize the work load, develop standardized cleanup methods for similar sites, and promote innovative cleanup technology;
 - Early action mechanisms that address immediate threats to public health and safety in a timely manner; and
 - Long-term action mechanisms to help the public understand the extended time commitment required to complete cleanup of a Superfund site, once immediate threats are removed.
- **Remedy Selection.** Cleanup of the average Superfund site takes 7 to 10 years, from listing to completion. EPA compresses each phase of remediation by qualifying fewer, better focused alternatives. Remedy-selection guidelines provide standard approaches for similar types of sites,

such as municipal landfills and PCB-contaminated sites.

- **Cleanup Targets.** Having completed cleanup at 150 sites by November 1992, the Superfund program moved toward a target of 200 completed sites by October 1993 and 650 by the end of fiscal 2000.
- **Public Involvement.** EPA increasingly involves communities near Superfund sites in cleanup decisions. New measures of cleanup success, based on protecting public health and the environment, initiate uniform outreach at the start and completion of each remedial action. Such measures enable the public to identify accomplishments within the Superfund cleanup process.
- **Innovative Technologies.** The EPA Technology Innovation Office, created in March 1990, promotes development and use of new treatments for cleanup problems such as decontaminating soils and groundwater. Promising new treatments clean up contamination more quickly, more effectively, and less expensively. The EPA Superfund Innovative Technology Evaluation Program measures the effectiveness of new techniques for destroying, immobilizing, or reducing hazardous waste and contaminated materials. EPA has completed 41 full-scale field demonstrations of new technologies prior to commercialization and 14 laboratory and pilot-scale studies; 91 new technologies are set for future

evaluation. Projects include soil washing, chemical dechlorination, underground vacuum extraction, and forcing of airstreams through water to evaporate volatile organic compounds. EPA is evaluating bioremediation--the use of microbes to break down organic contaminants --at demonstration cleanups across the country. Through fiscal 1991 EPA had selected 210 new technologies for use in remedial actions at NPL sites.

The Environmental Technology Division of the U.S. Bureau of Mines is undertaking similar research in developing new technologies for immobilizing or reducing hazardous waste and contaminated materials resulting from mining and mineral processing. Most of the contaminants are inorganic. For example, techniques have been developed to recover lead from scrap batteries and to treat lead-contaminated soil at battery breaker superfund sites.

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Chemical Emergencies

The Environmental Protection Agency (EPA) sponsors a cooperative program to ensure that local communities are prepared for accidents involving hazardous materials, to help reduce the number of accidents, and to assist in mitigating effects on public health and the environment should they occur. Participants include state, tribal, and local governments, industries, labor groups, environmental groups, and other stakeholders. The following laws and initiatives support state and local right-to-know and response planning:

Emergency Planning and Community Right-To-Know Act.
Part of the Superfund Amendments and Reauthorization Act

of 1986 (SARA), this law has two components:

- **Right-To-Know.** The Community Right-to-Know program involves reporting the presence and release of hazardous chemicals in communities, maintenance of the Toxic Release Inventory by EPA, and other measures to expand public access to such information.
- **Emergency Response Preparedness.** The 50 states and 6 U.S. territories have state emergency response commissions that oversee 4,000 local emergency planning committees. Local committees receive data on hazardous materials produced, used, or stored in their community; provide information to the public; and develop, update, and test emergency plans for responding to accidental releases of chemicals.

Clean Air Act Amendments of 1990. The CAA amendments require federal agencies to develop means of preventing and planning for chemical accidents that might discharge hazardous materials into the air.

Hazardous Materials Transportation Uniform Safety Act of 1990. This act establishes standards and provides for planning and training.

- **Transportation Standards.** The Department of Transportation (DOT) imposes standards for use by states and Native Americans in setting and enforcing routes for transportation of certain hazardous materials. In 1992 the DOT Research and Special Programs Administration (RSPA) issued a rule, establishing a national registration program for certain shippers and carriers of hazardous materials and a collection system to fund a national emergency response planning and training grant program.
- **Planning and Training Grants.** The act authorizes EPA to administer an assistance program that will award \$12.8 million annually during 1993-1998 to enhance preparedness and response capabilities of states and tribes.

Federal Response Plan. In 1992 EPA completed an interagency Federal Response Plan, with guidelines for responding to significant and catastrophic national emergencies, including earthquakes and hurricanes. EPA has lead responsibility for hazardous materials responses under the plan, which includes the following components:

- **National Response Team.** Key to activating the plan, this team is chaired by an EPA official and includes representatives of the United States Coast Guard, the departments of Defense, Energy, Agriculture, Commerce, Health and

Human Services, the Interior, Justice, Labor, Transportation, and State, the Nuclear Regulatory Commission, and the Federal Emergency Management Agency.

- **National Oil and Hazardous Substance Pollution Contingency Plan.** This plan, developed by EPA in coordination with members of the National Response Team, would assist in a national response to a chemical emergency.
- **EPA Emergency Operations Center.** This center would coordinate and monitor the federal response.
- **EPA National Incident Coordination Team.** Comprised of senior level officials from each of the major EPA pollution control offices and branches, this team would staff the Emergency Operations Center.

International Right-to-Know. The United States has been successful in using the community right-to-know program to provide a foundation for international chemical accident programs such as the following:

- **Organization for Economic Cooperation and Development.** OECD has developed a program called Guiding Principles for Chemical Accident Prevention, Preparedness, and Response;
 - **United Nations Environment Program.** UNEP has developed a program for developing countries called Awareness and Preparedness for an Emergency at the Local Level.
 - **United Nations Conference on Environment and Development.** At UNCED in Rio de Janeiro in 1992, the United States championed inclusion of community right-to-know policies and toxic release inventories in the Agenda 21 list of actions that the 180 countries present agreed by consensus should be standards for all governments. The principle of community right-to-know also was included in the UNCED Rio Declaration.
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Municipal Solid Waste

The nation can address local solid waste disposal problems by reducing the amount and toxicity of waste generated or, using

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techniques such as recycling and composting, by reducing the amount of waste needing disposal. Federal standards help protect human health and the environment, but implementation of solid waste programs remains largely a state and local matter. In 1988 EPA set a national goal of a 25-percent reduction by the end of 1992 in the amount of solid waste requiring disposal, using source reduction and recycling. Data for 1990 showed a national reduction in wastes of 21-23 percent, primarily through recycling. A sampling of current source reduction and recycling efforts follows.

Variable-Rate and Full-Cost Pricing. In 1992 EPA encouraged local and municipal governments to charge disposal fees that vary by the weight or volume of waste generated by a household. The agency advocated waste disposal fees that reflect both direct and indirect costs of the service. The market signals sent by variable-rate and full-cost pricing promote cost-effective waste reduction by providing an incentive to households to buy goods with the least amount of packaging. This market-based approach also increases recycling rates.

As an example, in 1988, among single-family-home garbage customers in Seattle, 39 percent subscribed to have two or more cans picked up each week at a cost higher than single-can service. In 1988 the city initiated curbside collection of recyclables and yard waste and in 1989 increased the rate for multiple cans from \$5 to \$9 per month. By 1991 customers subscribing for pick-up of two or more cans had fallen to 11 percent, and those subscribing

for pickup of less than a single 32-gallon can had increased from 1 to 25 percent. Between 1987 and 1991, largely because of the effect of the revised variable-rate structure and recycling initiatives on source reduction, recycling, and composting, the tonnage of residential solid waste disposed by the Seattle solid waste utility declined by 26 percent.

Federal Waste Reduction and Recycling. In response to the President's Executive Order of October 1991, requiring the U.S. government to promote waste reduction and recycling, 50 federal agencies named federal recycling coordinators and 36 submitted status reports on affirmative procurement programs to purchase products made of recycled materials. For more information, see the Federal Facilities Management section.

State and Local Recycling. Since 1988 local governments have increased the number of curbside-collection recycling programs by a factor of four. These programs now serve 65 million people. To assist state and local governments, federal agencies sponsor recycling initiatives, such as the following:

- An EPA Federal Procurement Hotline to provide vendors and government purchasing agents with information on such topics as available products with recycled content and contacts for vendors wishing to sell recycled products to the government;
- A procurement publication issued by the General Services Administration (GSA) helpful in identifying and selecting

products made from reclaimed materials.

- An EPA solid waste information clearinghouse;
- EPA publications such as Markets for Scrap Tires, the first in a series on market assessments for recyclable material; educational materials, such as Recycle Today!, a four-part set; and guides on composting and recycling materials, from motor oil to office paper.

Recreational Recycling. Now in its third year, a program cosponsored by the National Park Service, Dow Chemical, and Huntsman Chemical is among the first and largest recreational recycling efforts. To date, 600,000 pounds of material in six national parks have been recycled through the program. In 1992 the National Mall in Washington, D.C., became the seventh participating national park. The 160 bins to be set up on the Mall will collect hundreds of tons of material per year. Dow and Huntsman are underwriting program costs, including the design and installation of recycling bins, collection of recyclables, informational exhibits, and technical support. Start-up costs for the Mall project are \$250,000 for trucks and daily collection. In 1992 alone, Dow and Huntsman spent \$500,000 on establishing new recycling in the seven national parks that together attract 23 million visitors each year.

Paper and Wood Recycling. The Forest Products and Harvesting Research Program of the USDA Forest Service has embarked on a

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national recycling effort to reduce by half the paper and wood in the municipal waste stream. Only 25 percent of the wood and paper discarded annually is recycled, while waste paper accounts for 40 percent of the volume in landfills. Scientists are seeking new technologies to make more efficient use of recovered paper, paperboard, and wood waste. They are working to improve the quality of recyclable material from paper and to develop alternative, non-paper products from recycled wood fiber. They also are evaluating the economics of technologies for using recycled wood fiber and the economic and environmental impacts of expanded recycling.

Waste to Energy. In 1990, of all U.S. municipal solid wastes, 16 percent were combusted. Currently, 150 municipal waste-to-energy plants are in operation, combusting waste and converting 15 percent of the nation's solid waste into energy. In February 1991 EPA issued regulations for waste-to-energy plants, controlling air emissions of organics, heavy metals, and acid gases such as hydrochloric acid. Regulations ensure the maintenance of proper combustion conditions. Although combustion products--residue or ash--may be high in concentrations of heavy metals, they can be safely handled in landfills that meet the new national standards. The National Energy Strategy projects that waste-to-energy plants in the year 2010 will produce seven times the amount of power that they currently generate.

Landfills. In 1991 EPA issued regulations to improve the

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safety of municipal solid waste landfills to become effective in October 1993. New management standards for municipal landfills cover the following categories of concern: location restrictions, operating requirements, design standards, groundwater monitoring and corrective action, closure and post-closure care, and owner/operator financial responsibility. Regulations cover facilities throughout their operating life and during their post-closure care period for 30 years. The rule may create an incentive for increasing source reduction and recycling nationwide because of the increased costs of disposal.

INTERNATIONAL ISSUES

Also see related tables and figures in Part II.

In 1992 the focus on international issues intensified, as policymakers and the general public heard a steady stream of reports from the scientific community on the global nature of many environmental problems. The United Nations Conference on Environment and Development (UNCED) made international environmental issues front-page news and underscored critical linkages between environmental quality and economic development.

Conditions and Trends

Environmental concerns recognize no political borders, and among the transboundary issues of greatest concern in 1992 were biodiversity, forests, global climate change, ozone-layer depletion, and oceans.

Biodiversity

Harvard University's E.O. Wilson estimates that the current worldwide rate of extinctions exceeds 1,000 times the natural rate. Each of these losses from the world's natural heritage represents the potential loss of ecological, economic, and aesthetic benefits. At the present time, no nation has full and accurate information on these losses or on the status and

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distribution of biodiversity components or on the functioning of
ecosystems.

The diverse global genepool possesses the potential for vast economic value for humanity. Food products from wild species include fisheries, which in 1989 provided 100 million tons of food worldwide. Domesticated species account for 12-32 percent of gross domestic product (GDP) in countries around the world. In addition to providing timber, natural fibers, gums, and oils, biodiversity is a major source of medicinal products for traditional medicine practiced by 80 percent of people in developing countries. Diverse biota also fuel the development of modern pharmaceuticals. One quarter of all prescriptions dispensed in the United States contain active ingredients extracted from plants. Over 3,000 antibiotics, including penicillin and tetracycline, are derived from microorganisms. Biodiversity also supports recreation and tourism throughout the world.

The loss of biodiversity can result from a number of factors, particularly habitat loss and fragmentation, introduced species, over-exploitation of plant and animal species, pollution, global climate change, and industrial agriculture and forestry. These factors are not confined to tropical regions but affect temperate ecosystems as well. For more information, see the Biodiversity section.

Forests

Forests provide valuable goods and services, including timber, fuelwood, and a variety of non-timber products; soil and watershed protection; regulation of climate; habitat for a diversity of living things; and recreation. Forest services and products are of ecological and economic value locally, nationally, regionally, and globally.

However, forests around the world are under stress. According to the 1990 assessment of the U.N. Food and Agriculture Organization, tropical forests are disappearing at a rate of 17 million hectares (42 million acres) per year. Exacerbated by population pressures and poverty, forest loss is the result of the following primary causes:

- National policies and subsidies that distort markets and provide incentives for forest conversion to farmland and pasture;
- Destructive logging practices, including overharvest of commercial forests, below-cost timber sales, and export controls; and,
- Large-scale development projects such as hydropower and mining.

Temperate and boreal forests, although expanding in some areas, are substantially degraded in others primarily because of air pollution and inefficient harvesting. In some parts of

Eastern Europe, forest dieback from air pollutants is as high as 50 percent. For more information, see the Forestry section.

Global Climate Change

The past year witnessed intensive examination of data and trends associated with the global climate system. The Intergovernmental Panel on Climate Change (IPCC) was created in 1989 under the auspices of the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP). In 1990 IPCC issued its first assessment on the science, impacts, and possible responses to climate change. The report projected a global mean temperature rise of 0.3°C per decade caused by increases in greenhouse gas emissions from human activity. It also noted uncertainties that hamper the ability of scientists to make accurate predictions regarding the carbon cycle or the possible function of clouds, oceans, and biota as natural feedback mechanisms. In 1992 IPCC issued a brief supplement that included the following findings:

- Persistent uncertainties in scientific understanding of the climate system;
- Discoveries of a possible function of CFCs and sulfate aerosols as offsets to greenhouse warming;
- The sensitivity of global mean surface temperature to atmospheric concentrations of carbon dioxide or its equivalent;

- A continual and substantial rise in atmospheric concentrations of greenhouse gases over pre-industrial levels; and
- A rise of 0.3 to 0.6 degrees Centigrade in global mean temperatures over the last century.
- No definitive association of such warming with man-made emissions, and no unequivocal detection of a human-enhanced greenhouse effect likely for a decade or more.
- Problems associated with the use of current global warming potential (GWP) coefficients for comparisons among greenhouse gases, particularly CFCs, CFC substitutes, nitrous oxides, volatile organic compounds, and carbon monoxides.

Oceans

Like the forests, the world's oceans are also under stress. Their productive and regenerative capacity is threatened by the introduction of pollutants and over-utilization of marine resources. Conditions in the marine environment vary widely, and the open sea remains relatively clean. Lead, synthetic organic compounds, and artificial radionuclides are widely detectable but at extremely low levels. The oil slicks and litter common along sea lanes are, for the most part, of minor consequence to communities of organisms living in open-ocean areas.

In contrast to the open ocean, however, coastal regions--where natural resources and human development concentrate--are particularly at risk. Encroachment on coastal areas continues worldwide. Habitats are being lost irretrievably to the construction of harbors and industrial installations, to the development of tourist facilities and mariculture, and to the growth of settlements and cities. Although difficult to quantify, destruction of beaches, coral reefs, and wetlands, including mangrove forests, as well as increasing erosion of the shore, are evident all over the world.

Ozone-Layer Depletion

Troubling findings emerged during 1992 on the condition of the stratospheric ozone layer, which protects the Earth's surface from harmful levels of solar radiation. Early in the year, UNEP released its latest International Ozone Assessment and NASA and NOAA released findings from the second U.S. Airborne Arctic Stratospheric Expedition. Both studies presented evidence of faster, more widespread ozone depletion than previously suspected, leading to concerns about greater incidence of skin cancer, cataracts, and ecological damage. In the fall, NASA and NOAA announced additional troubling news on the health of the ozone layer--the widest-ever ozone depletion over Antarctica.

Debate also took place over a substance previously unrecognized as a factor in ozone-depletion--methyl bromide.

Noting the need for intensive and additional research, the 1992 UNEP assessment identified methyl bromide as potentially having a high ability to deplete stratospheric ozone. In workshops and seminars held throughout the summer, U.S. government, academic, and private-sector experts reduced some of the unknowns--finding that each molecule of methyl bromide does have approximately two-thirds the ability of CFC-11 to deplete the ozone layer. For some key applications of methyl bromide in agriculture and food exports, however, safe alternatives have yet to be identified.

Policies and Programs

Worldwide progress in protecting the ozone layer, endangered species, and air and water quality continued under international agreements and U.S. initiatives; and 1992 capped two years of preparations for the United Nations Conference on Environment and Development (UNCED). UNCED concluded with major new international policies, as reflected in The Rio Declaration, Agenda 21, and A Statement of Forest Principles, and opened for signature the newly negotiated U.N. Framework Convention on Climate Change and the Convention on Biological Diversity.

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The Earth Summit

The United Nations Conference on Environment and Development (UNCED), known by many as the Earth Summit, brought together 6,000 delegates from over 170

countries for discussions and negotiations on such diverse and contentious topics as climate change, biodiversity, deforestation, desertification, oceans, technology cooperation, and economic relations between developed and developing countries. UNCED concentrated world attention on the linkages between environment quality and economic development and resulted in progress on many of the most pressing challenges facing the world.

UNCED, held June 3-14, 1992, in Rio de Janeiro, Brazil, marked the twentieth anniversary of the landmark Stockholm Conference on the Human Environment in 1972. The 1992 Earth Summit produced three principal documents and two conventions, summarized here along with an update on UNCED follow-up in the United States.

Rio Declaration on Environment and Development.

This non-binding statement of 27 basic principles, was meant to enhance environmental protection and development worldwide. The United States advocated focus on the principles of public participation in decision-making, access to information, environmental assessments, and market-based economic and environmental strategies.

Agenda 21: An Action Plan for Sustainable Development. This 580-page document charts a course toward the goal of sustainable development. Its 40 chapters propose specific approaches to issues such as the following:

- **Oceans.** The oceans chapter includes comprehensive strategies addressing marine pollution from land-based activities and the conservation of marine life. In the section on marine pollution, the United States successfully promoted the use of economic incentives to limit industrial and agricultural activities that pollute the seas. The United States also obtained language to ensure that populations of marine species are maintained at healthy levels, that populations of endangered marine mammals are protected, and that fishing gear is used that minimizes the incidental catch of non-target species.
- **Hazardous and Solid Wastes.** The chapters on hazardous and solid wastes address key elements, such as waste prevention and minimization. The text recognizes and supports innovative programs for reducing the generation of hazardous and solid wastes, including the use of market mechanisms and

the provision of relevant information on environmental risks to potentially affected communities. The hazardous waste chapter endorses and calls for speedy ratification of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

- **Toxic Chemicals.** This chapter in Agenda 21 proposes a structure for international work in chemical risk assessment and management that is likely to produce concrete and productive results, given the high degree of international cooperation already existing in this area. Reflecting lessons learned through the U.S. Community Right-to-Know Program, the chapter encourages states to establish similar programs for chemical risks, invites appropriate international organizations to develop guidance for such programs, and encourages industry to adopt voluntarily such programs in the absence of host country requirements.
- **Forests.** This chapter provides a common approach for countries to integrate national actions and international cooperation with the conservation and sustainable development of forests. It identifies actions in four program areas: multiple roles of forests; protection, conservation, and sustainable management; promoting efficient utilization; and planning assessment and monitoring.
- **Technology cooperation.** The United States introduced the concept of technology cooperation at UNCED. The chapter on technology incorporates U.S. efforts to highlight the concepts necessary to make technology cooperation successful. The United States emphasized the transfer of environmentally sound technology as one element within a broader framework of cooperative activities. This framework includes the development of information networks, building indigenous technological capacity, regional research centers, and the effective use of technological assessment.
- **International Institutions.** The chapter on reform of international institutions called for strengthened interagency coordination in the U.N. system; enhanced roles for the U.N. Environment Program (UNEP), the U.N. Development Program (UNDP), and other U.N. agencies; the drafting of national plans for sustainable development; and an enhanced role for non-governmental organizations in U.N. deliberations and programs. It

recommended that the U.N. General Assembly establish a Commission on Sustainable Development. As a senior-level body of the Economic and Social Council (ECOSOC), such a commission will provide a forum for the exchange of information about national and multilateral experiences in implementing the UNCED recommendations.

- **Finance.** One of the most difficult issues addressed at UNCED was finance. This chapter resulted from intense negotiations and reflected a delicate balance between the need for developing countries to mobilize internal resources for sustainable development and their need for additional assistance from the developed world. The United States stressed realistic economic policies, the role of the private sector, and innovative methods of financing environmental protection, such as debt-for-nature swaps.

Statement of Forest Principles for the Management, Conservation, and Use of Forests. At the initiative of President Bush, heads of state at the 1990 G-7 summit in Houston announced their support for negotiation of a legally binding international agreement on forests to be signed at Rio. Many developing countries were reluctant to move rapidly into an agreement that would set binding commitments on their forests, which are sovereign, revenue-producing resources. A consensus emerged to negotiate under the auspices of UNCED a "non-binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests." The United States and other G-7 countries view the forest principles as a first step towards a future forest convention.

After two years of negotiations, a statement of forest principles was adopted at UNCED, recognizing the value of the world's forests as sources of a variety of economic goods and ecological services. A number of the principles address the need for national policies to ensure that countries manage forestlands on a sustainable basis to meet the needs of present and future generations. Other principles address the role of international cooperation, including financial and technical assistance, trade, and science.

In his statement at UNCED, President Bush introduced a Forests for the Future initiative to end net worldwide forest loss within a decade. The President called upon donor nations to double worldwide assistance for forest conservation from \$1.4 billion to

\$2.7 billion. Leading by example, he pledged to double U.S. bilateral forest assistance in 1993, with an increase of \$150 million. He called for domestic actions to end the use of clearcutting as a standard commercial timber harvest practice on federal forestlands, as part of an ecosystem approach to the sustainable management of forests, and noted the America the Beautiful initiative, which is working to plant one billion trees per year in the United States.

UNCED also opened for signature the U.N. Framework Convention on Climate Change, signed by the United States, and a Convention on Biological Diversity, which the United States refrained from signing. The conventions are discussed separately in this section.

UNCED Follow-Up in the United States. During his remarks in Rio, President Bush noted the need for follow-through on the UNCED commitments and challenges. In August 1992 the United States initiated domestic follow-up efforts. Under a cabinet-level Policy Coordinating Group, the Department of State and the President's Council on Environmental Quality began to review action items in Agenda 21, comparing them to existing U.S. programs. This review will help identify priorities for further action, provide the framework for U.S. contributions to the U.N. Commission on Sustainable Development, and facilitate work on a U.S. sustainable development strategy to be completed by the end of 1993.

The following update on major international environmental issues is presented in alphabetical order.

Antarctica. In October 1991 the United States and most other Antarctic Treaty Parties signed a protocol on environmental protection with provisions on the conservation of flora and fauna, waste disposal, marine pollution, environmental impact assessment, and protected areas. The protocol prohibits the mining of mineral resources for at least 50 years. Pursuant to the protocol, Antarctic Treaty Parties convened a meeting of

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experts on environmental monitoring in Buenos Aires in June 1992.

The Arctic. A number of meetings took place in 1992 under the Arctic Environmental Protection Strategy (AEPS) adopted by the United States and the seven other Arctic Rim nations in 1991. Topics included conservation of fauna and flora and response to environmental emergencies. AEPS participants have established the Arctic Monitoring and Assessment Program, with a secretariat located in Norway.

Biodiversity. The United States was an early supporter of the goal of negotiating an international convention to reduce the loss of biological diversity. The complexity of these issues, combined with international pressure to have a final text before UNCED, resulted in a convention that covered several issues beyond the conservation of biodiversity, which the United States fully supports. The United States opposed the convention's provisions related to the protection of intellectual property rights, access to genetic information in biotechnology, and finance and declined to sign it in its present form. In his speech at UNCED, however, President Bush stressed that the United States would exceed the conservation-related provisions of the convention.

The U.S. commitment to biodiversity supports provisions of the UNCED Agenda 21 chapter on biodiversity. In response to the call for increased research, the United States proposed a plan to foster international cooperation on biodiversity surveys,

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inventories, and data organization. The United States plans to host a meeting of international experts in early 1993, to consider such topics as data gathering and reporting standards, approaches to conducting inventories and surveys, data management techniques, and institutional issues related to biodiversity surveys. Efforts are underway to develop a National Biodiversity Center to coordinate and make available such information in the United States.

The United States supports programs for worldwide biodiversity research and conservation through the Conservation of Biological Diversity Program administered by the U.S. Agency for International Development (USAID). The Biodiversity Support Program, a joint venture by USAID, the World Wildlife Fund, The Nature Conservancy, and the World Resources Institute, provides expertise on biodiversity around the world. A USAID/National Science Foundation collaborative program supports research and education in developing countries on potential threats to ecosystems and species.

Canada. In March 1992 the United States and Canada released the first progress report under the U.S.-Canada Air Quality Accord signed in March 1991. The agreement ushers in a new era of cooperation between the two countries to reduce air pollution. Initial emphasis is on acid rain and visibility.

The United States and Canada established a bilateral Air Quality Committee and increased the exchange of experts and

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information on North American air quality matters. The two countries continued intensive cooperation on Great Lakes protection, implementing a Great Lakes Toxic Air Pollution Deposition-Monitoring Program. In September 1992 EPA, Environment Canada, and the Mexican Secretariat of Social Development signed a new trilateral memorandum of understanding (MOU) on environmental education.

In October 1992 the Convention on Environmental Impact Assessment in a Transboundary Context was presented to the U.S.-Canada International Joint Commission. Guidelines for implementation of the convention are being negotiated.

Caribbean Region. In 1992 the U.S. Department of State sent the Protocol Concerning Specially Protected Areas and Wildlife in the Caribbean Region (the SPAW Protocol) to the Senate for its advice and consent to ratification. The protocol builds on existing international obligations to establish specially protected areas to preserve rare or fragile ecosystems, especially the habitats of threatened or endangered species.

Convention on International Trade in Endangered Species. As a party to the Convention on International Trade in Endangered Species of Fauna and Flora (CITES), the United States participated in the eighth conference of the parties in March 1992 in Kyoto, Japan. Among decisions reached by the conference, parties agreed to continue listing the African elephant and ban all trade in ivory. For the first time, CITES addressed issues

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involving the possible listing of commodity species such as blue fin tuna and several tropical timbers. The parties also decided to carry out a reevaluation of the scientific criteria upon which listing actions are based. The treaty is evolving to deal with a future in which trade issues and species conservation will become increasingly intertwined. The United States will host the ninth conference of the parties to CITES in late 1994.

In 1992 Congress enacted new legislation that will facilitate U.S. implementation of decisions and resolutions under CITES regarding exotic birds. Provisions authorize regulation of imports of exotic birds whose populations may be adversely affected by trade. They also authorize the Secretary of the Interior to support wild bird management efforts in other nations.

Dolphins. In June 1992 the United States and nine other nations adopted a multilateral dolphin conservation program for the eastern tropical Pacific Ocean that will reduce the incidental mortality of dolphins in the tuna purse seine fishery to the lowest possible level. In that region, yellowfin tuna and dolphins swim together, and large numbers of dolphins have been killed during fishing operations over the last three decades.

The program's strict schedule will reduce mortality to less than 5,000 dolphins per year by 1999, which is less than 0.1 percent of the total estimated dolphin population in the eastern tropical Pacific Ocean. The program also establishes a research

effort to find ways to catch yellowfin tuna without harming dolphins and provides for a detailed mechanism and review panel to ensure that mortality limits are not exceeded.

In October 1992 Congress passed and President Bush signed into law amendments to the Marine Mammal Protection Act (MMPA) that include new tuna/dolphin measures. The 1992 MMPA amendments hold out hope for significant reductions and a potential end to all dolphin mortality in the eastern tropical Pacific. By providing for a dolphin-safe tuna market by 1994, the law will reduce demand for tuna caught in ways that harm dolphins.

Driftnet Fishing. This highly destructive fishing technique results in large incidental takes of marine mammals, seabirds, and other forms of life. In keeping with a U.S. co-sponsored U.N. General Assembly resolution, a moratorium on driftnet fishing went into effect on January 1, 1993.

Within the United States, the High Seas Driftnet Fisheries Enforcement Act of 1992 reflects the U.S. commitment to translating international concerns into practice. The Driftnet Act extends the prohibition on high seas driftnet fishing and prohibits the import of all fish and fish products and sport fishing equipment from any country engaged in high seas driftnet fishing beginning January 1, 1993. The law provides for denial of port privileges and navigation in U.S. waters for vessels engaged in the prohibited fishing practice. The Driftnet Act also includes measures to establish an international regime for

the management of the high seas fishery in the Central Bering Sea.

Eastern and Central Europe. Building on existing bilateral accords and using funds provided under the Support for Eastern European Democracy Act of 1989, the United States continued to assist countries in the region with development of environmental legislation and institutions. The United States also provided technical assistance and financial support for activities such as energy efficiency centers in Prague and Warsaw. U.S. agencies such as EPA, DOE, and AID contributed to expanded regional cooperation on transboundary issues through bilateral and multilateral mechanisms. An example is the follow-up process from the 1991 Dobris Castle meeting.

Enterprise for the Americas Initiative. The United States continued to implement the Enterprise for the Americas Initiative (EAI), initiated in 1991. In February 1992 Chile and the United States signed an Environmental Framework Agreement. Similar agreements were signed previously by the United States with Jamaica and with Bolivia.

Under each framework agreement, the United States and the participating nation establish the terms and mechanisms for reduction of certain debt ("PL-480 debt") and payment of interest on other debt in local currency into accounts that can be drawn on to fund environmentally sound and sustainable projects in the host country. Participating countries qualify for the program by

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implementing macroeconomic and trade policies supportive of free-market systems.

Global Climate Change. Continuing concerns about global climate change led the international community to conclude negotiations and adopt the text of the U.N. Framework Convention on Climate Change in May 1992. In June 1992 over 150 countries, including the United States, signed the Framework Convention on Climate Change at UNCED in Rio de Janeiro.

The convention will enter into force upon ratification by 50 countries. In September 1992 President Bush submitted the treaty to the U.S. Senate for its advice and consent. Following Senate hearings and consideration, on October 13, 1992, the United States became the first industrialized nation, and only the fourth nation overall, to ratify the convention.

The convention establishes the foundation for a dynamic international response to climate change through a variety of goals that include the following:

- Mitigation of climate change through the design, implementation, and reporting on national strategies to address anthropogenic emissions by greenhouse gas sources and removals by sinks (such as forests);
- Accommodation of national political and economic circumstances, specifically avoiding the use of uniform quantitative emissions targets and timetables;
- Integration of climate change and other concerns by

encouraging parties to take account of climate change in developing economic, social and environmental policies (and vice versa);

- Assistance for developing countries--both in collecting data on net greenhouse gas emissions and in limiting the rate of growth in emissions;
- Defining a financial mechanism to provide funding for agreed incremental costs of projects in developing countries that produce global environmental benefits;
- Increasing awareness of the causes and implications of climate change and response measures through public education and training;
- Improving the capacity of countries to observe, model, and understand the global climate system, promoting continued, internationally coordinated climate change research.

To assure rapid implementation of the convention, the United States supported a resolution providing for a "prompt start" to critical tasks in preparation for the first meeting of the conference of the parties. At UNCED, President Bush proposed early discussions by industrialized countries of national action plans to control greenhouse gases. Such discussions would comprise one part of the convention's prompt start. The United States had presented initial elements of a national action plan at meetings of the Intergovernmental Negotiating Committee (INC)

in 1991 and added further measures in May 1992. The United States projects that these measures will result in net greenhouse gas emissions levels in 2000 of only 1.4 to 6 percent above 1990 levels. Such levels would be 6-11 percent below baseline projections for 2000 made in 1990.

The United States unilaterally pledged \$25 million over two years to assist developing countries in conducting climate change country studies to accomplish the following objectives:

- Assess the vulnerability of developing countries to climate change;
- Develop inventories of sources, sinks, and reservoirs of greenhouse gases;
- Assess technological options to reduce greenhouse gas emissions and to adapt to climate change; and,
- Assess the feasibility of undertaking specific climate-related projects.

The United States hosted a Country Studies Workshop in September 1992 in Berkeley, California, and continued to fund over half the world's scientific research on climate change. The U.S. Global Change Research Program is designed to reduce key scientific uncertainties and to develop more reliable scientific predictions upon which sound responses to global change can be based. Results from this work are available to the international scientific community.

An Inter-American Institute for Global Change Research was

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established in June 1992 under U.S. leadership. The institute is a network of research centers that conduct and sponsor basic research on global change processes of special value to the Americas. The institute could be the first of several research centers worldwide to examine global change processes at the regional level.

Global Environment Facility. The Global Environment Facility (GEF) was established in 1990 as a 3-year pilot project to provide financial and other assistance to developing countries for innovative projects in environmental protection that provide global benefits. The World Bank, the United Nations Development Program (UNDP), and UNEP serve as joint implementing agencies for the facility. GEF funds can be used for projects that produce global environmental benefits in the areas of global warming, ozone-layer protection, protection of biodiversity, and international waters. In addition, GEF was named as the interim financial mechanism for both the Framework Convention on Climate Change and the Biodiversity Convention. Four rounds or tranches of GEF projects have been submitted to the participating countries for approval.

International Whaling Commission. At its annual meeting, the International Whaling Commission (IWC) moved toward adopting a sustainable, scientifically based procedure--the Revised Management Procedure--for calculating whale quotas. At the same time, the IWC parties agreed that, until this procedure is

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adopted and in force, the moratorium on commercial whaling should continue, a stance strongly supported by the United States.

Highly Migratory Species. The conservation and management of highly migratory species of fish are items of concern to the U.S. government. Following UNCED, the United Nations General Assembly adopted a resolution endorsing an intergovernmental conference on high seas fishing issues, planned for late 1993. U.S. interest in high seas fisheries management focuses mainly on stocks such as the central Bering Sea pollock, highly migratory species such as the yellowfin tuna, and anadromous species such as the Pacific and Atlantic salmon.

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Trade and the Environment

The intersection of environmental concerns and trade received unprecedented attention in 1992. An accumulating body of evidence indicates that trade liberalization is associated with increases in national incomes, providing financial resources that can be devoted to environmental protection. At the same time, trade liberalization needs to be sensitive to environmental concerns and values.

NAFTA. The landmark event in 1992 in trade and the environment was the negotiation of the North American Free Trade Agreement (NAFTA) by the United States, Mexico, and Canada. In May 1991 the Bush administration pledged to make environmental concerns a key component of NAFTA and parallel negotiations. In early 1992 the Office of the U.S. Trade Representative published a review of NAFTA-related environmental issues, including recommendations for negotiators. As a result, NAFTA includes the following provisions:

- For the first time ever in a trade agreement, the countries agreed to explicit language affirming their commitment to promote sustainable development;
- NAFTA expressly states the resolve of the

countries to implement the agreement in a manner consistent with environmental protection;

- The countries will strive toward compatibility and equivalence of various types of environmental standards, while affirming each country's right to choose the level of environmental protection that it considers appropriate;
- NAFTA states that signatories should not lower health, safety, or environmental standards for the purpose of attracting investment;
- NAFTA dispute settlement panels may call on environmental experts to provide advice on factual questions related to the environment.

On a parallel track, NAFTA countries agreed in principle and began negotiations to establish a North American Commission on the Environment (NACE). Comprised of the environment ministers from the three countries, NACE will provide a forum for the countries to cooperate on issues of mutual concern, including the environmental effects of trade.

Also in 1992 the United States and Mexico initiated an agreement to establish a Joint Committee for the Protection and Improvement of the Environment. This agreement lays the foundation for cooperation in environmental training and enforcement on a country-wide basis. The two countries also developed a 1992-1994 Integrated Environmental Plan for the U.S.-Mexico Border Area, focusing on areas where particular attention should be paid to environmental effects associated with trade liberalization.

NAFTA sparked interest among countries outside the region that are embarking on the process of integrating their own trade liberalization and environmental protection concerns.

UNCED. Trade and environment issues were a key part of discussions at the U.N. Conference on Environment and Development, as reflected in Principle 12 of the Rio Declaration:

States should cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation. Trade policy measures for environmental purposes should not constitute a means of arbitrary or

unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on an international consensus.

Principle 12 reflects the concern of countries for trade liberalization as a step toward sustainable development.

OECD and the GATT. Increasing concern about trade and environment issues accelerated activities in the Organization for Economic Cooperation and Development (OECD) and the General Agreement on Tariffs and Trade (GATT). Discussions focused on the use of trade measures to support environmental purposes, both by individual countries and in multilateral environmental agreements, and the potential competitive effects of environmental regulation.

In these fora, experts discussed issues raised by the September 1991 GATT panel report on U.S. measures to protect dolphins by restricting imports of tuna caught with nets that can kill dolphins. They also discussed issues raised by the December 1991 GATT secretariat's draft (the Dunkel Text) of agreements under negotiation in the current Uruguay Round of multilateral trade talks.

Within OECD, the United States takes a leading role in developing guiding principles in trade and environment. Within the Bush administration, an interagency working group integrates the views of agencies concerned with environmental and trade policies. The Bush administration seeks the views of non-governmental individuals and groups concerned with trade and the environment.

Multilateral Development Banks. The United States continued its efforts to encourage the World Bank and other multilateral development banks to integrate environmental considerations into lending practices. Prior to action by the World Bank Board, a U.S. interagency group evaluates projects for

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environmental significance. The United States will not vote for a project with significant negative environmental effects, unless an environmental impact assessment or comprehensive summary analyzing alternatives is made available to affected local groups, local non-governmental organizations, and World Bank executive directors 120 days in advance of a Board vote. U.S. efforts have resulted in increased use of environmental impact assessments and greater public review of proposed projects in developing countries.

In 1992 the World Bank developed new policies in agriculture and water resource management. Such reforms, undertaken largely at U.S. urging, served to strengthen linkages between environment and development goals in lending programs. They also generated greater consultation by the World Bank with affected groups and non-governmental organizations. The United States encouraged regional development banks to undertake similar reforms.

Multilateral development banks recognize the need to promote energy efficiency and conservation. In 1992 the World Bank completed a series of studies on these issues, including experiences in the United States and in several newly industrialized countries in Asia. In October 1992 a World Bank task force completed a report on lending in the energy sector, and the World Bank Board adopted a new policy for the electric power sector and energy efficiency. The United States is encouraging the regional banks to follow suit.

Formal discussions regarding a tenth replenishment of funding for the International Development Association (IDA) continued through most of 1992. The U.S. position underscored the need to ensure that IDA activities include full public participation and address environmental considerations.

North Atlantic Salmon Conservation. At the June 1992 Ninth Annual Session of the North Atlantic Salmon Conservation Organization (NASCO), the United States announced a long-term objective to end ocean commercial interceptory fisheries for Atlantic salmon. The United States will continue to recognize the legitimate rights of subsistence users and personal-use fisheries and the fact that interceptions of salmon cannot be entirely eliminated. NASCO approved a Protocol to the Convention on Conservation of Salmon in the North Atlantic Ocean, which prohibits the fishing of Atlantic salmon stocks beyond national jurisdictions and takes appropriate actions to enforce the protocol.

North Pacific Marine Science Organization. A Convention for the North Pacific Marine Science Organization (PICES) entered into force in March 1992. Canada, Japan, and the United States are inaugural members, with China and Russia expected to become members soon. PICES has a broad-based mandate to promote and coordinate marine and related research on a multi-disciplinary basis. The convention will focus on research on the ocean environment and its interactions with land and atmosphere; its

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role in response to global weather and climate change; its flora, fauna, and ecosystems; its uses and resources; its impact on humans; and the impacts of human activity upon the north Pacific.

Ozone-Layer Depletion. In August 1992 the 1990 Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer entered into force for the United States and 19 other countries. Parties to the Montreal Protocol and its 1990 amendments have agreed to phase out the production of chlorofluorocarbons (CFCs) and other ozone-depletion substances by the end of the century.

In February 1992, in response to scientific evidence indicating that ozone depletion may be occurring more rapidly and widely than previously believed, President Bush accelerated the U.S. phaseout deadline to the end of 1995--four years ahead of the Montreal Protocol deadline. The United States is leading efforts to seek international agreement to an accelerated phaseout for CFCs and other substances.

To speed progress in the near term, President Bush asked U.S. producers to cut 1992 output to half of 1986 levels, even though under existing law, producers were allowed to be at 80 percent of 1986 levels. In early 1992, due in large part to the use of innovative market-based mechanisms such as fees and tradable allowances, U.S. production of CFCs dropped more than 40 percent below 1986 levels, a reduction beyond that required by either the 1990 Clean Air Act Amendments or the Montreal

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Protocol.

Parties to the Montreal Protocol created the Interim Multilateral Fund in 1990 to assist developing countries undergoing the transition to CFC-replacement technologies. Total contributions to this voluntary 3-year fund rose from \$160 million in 1991 to \$200 million in 1992 and are expected to increase substantially in 1993.

Pollution from Ships. In March 1992 the United States became the first nation to ratify the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), negotiated under the auspices of the International Maritime Organization (IMO). The convention, which increases the protection of the marine environment from oil spills, calls for planning, reporting, technology sharing, and cooperation. OPRC requires parties to establish national systems for preparedness and response, a system the United States has established through the 1990 Oil Pollution Act. The U.S. Coast Guard is working with IMO to define OPRC implementation plans and to bring existing contingency plans with Canada, Japan, Mexico, Bermuda, and Russia into conformity with the convention.

Sea Turtles. During the past three years, the United States implemented legislation to promote the conservation of threatened and endangered species of sea turtles. The law requires countries in the wider Caribbean, whose commercial shrimp-fishing operations may result in the incidental capture and drowning of

sea turtles, to adopt specific measures to reduce incidental capture, if they intend to sell that shrimp in the U.S. market.

Shrimp fishermen in the United States are required by law to equip their nets with a piece of gear known as a "turtle excluder device" (TED), which reduces the incidental capture of sea turtles by more than 97 percent and whose use is considered essential for the survival of endangered sea turtle populations in the wider Caribbean. Imports of shrimp from any country in the wider Caribbean that does not undertake comparable steps to install TEDs and reduce incidental sea turtle take may be embargoed. The United States is making technical assistance available to affected countries to assist them in developing programs and in incorporating TED technology into their shrimp fleets.

South Pacific. The South Pacific Regional Environment Program (SPREP), in which the United States participates, serves as a catalyst for environmentally sound planning and management in the region through the following objectives:

- Study possible effects of global climate change;
- Encourage effective coastal management and pollution prevention planning;
- Develop response strategies for pollution emergencies; and
- Encourage environmental education and outreach programs.

Technology Cooperation. The United States supports technology cooperation with developing countries and countries

with economies in transition to help them find environmentally sound paths to economic growth and development. Technology cooperation takes the following forms:

- **Information Exchange.** A new Environmental and Energy Efficient Technology Transfer Clearinghouse, sponsored jointly by USAID, EPA, and the Department of Energy (DOE) will provide information on pollution control, renewable energy, and energy-efficient technologies. Pilot programs have been established in Mexico City and at UNIDO in Vienna.
- **Training and Technical Assistance.** The Environmental Training Institute shares U.S. environmental advances with developing countries by providing training courses to foreign executives. A Technology Cooperation Corps, currently being developed, will engage the U.S. private sector with counterparts abroad to identify ways in which U.S. corporations might share their expertise in environmental management and technology.
- **Capacity Building.** The United States has established an Energy Efficiency Center in Russia to complement similar centers previously established in Eastern Europe. The purpose of the centers is to protect the environment by promoting energy efficiency.
- **Technology Transfer and Development.** The Department of Energy ADEPT program (Assisting Deployment of Energy Practices and Technology) encourages joint energy technology

ventures between U.S. national laboratories and industrial groups working in integrated project teams with developing country counterparts. Through the America's 21st Century program, DOE also is assisting the U.S. renewable energy industry in forming joint ventures in Latin America and the Caribbean.

U.S.-Asia Environmental Partnership. In January 1992 President Bush announced the United States-Asia Environmental Partnership (US-AEP), formed to address the challenge of balancing environmental protection with development through U.S. environmental expertise and technology. The partnership involves U.S. and Asian businesses, governments, and community groups in a program that includes technological cooperation, environmental fellowships and training, and conservation of regional biodiversity. More than 25 Asian countries are eligible to participate in the partnership, coordinated by a working group co-chaired by USAID and the U.S. Department of Commerce and including 17 other federal agencies.

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Agenda 21: List of Chapters

A distinctive characteristic of UNCED and the environmental blueprint it generated is the breadth of topics addressed. A list of Agenda 21 chapter headings follows:

Section I. Social and Economic Dimensions

- International Cooperation to Accelerate Sustainable Development in Developing Countries and Related Domestic Policies;;
- Combating Poverty;

- Changing Consumption Patterns;
- Demographic Dynamics and Sustainability;
- Protecting and Promoting Human Health Conditions;
- Promoting Sustainable Human Settlement Development;
- Integrating Environment and Development in Decisionmaking.

Section II. Conservation and Management of Resources for Development

- Protection of the Atmosphere;
- Integrated Approach to the Planning and Management of Land Resources;
- Combating Deforestation;
- Managing Fragile Ecosystems: Combating Desertification and Drought;
- Managing Fragile Ecosystems: Sustainable Mountain Development;
- Promoting Sustainable Agriculture and Rural Development;
- Conservation of Biological Diversity;
- Environmentally Sound Management of Biotechnology;
- Protection of the Oceans, All Kinds of Seas, Including Enclosed and Semi-enclosed Seas, and Coastal Areas and the Protection, Rational Use, and Development of Their Living Resources;
- Protection of the Quality and Supply of Freshwater Resources: Application of Integrated Approaches to the Development, Management, and Use of Water Resource;
- Environmentally Sound Management of Toxic Chemicals, Including Prevention of Illegal International Traffic in Toxic and Dangerous Products;
- Environmentally Sound Management of Hazardous Wastes, Including Prevention of Illegal International Traffic in Hazardous Wastes;
- Environmentally Sound Management of Solid Wastes and Sewage-related Issues;
- Safe and Environmentally Sound Management of Radioactive Wastes.

Section III. Strengthening the Role of Major Groups

- Global Action for Women towards Sustainable and Equitable Development;
- Children and Youth in Sustainable Development;
- Recognizing and Strengthening the Role of Indigenous People and their Communities;
- Strengthening the Role of Non-governmental Organizations: Partners for Sustainable Development;
- Local Authorities' Initiatives in Support of Agenda 21;
- Strengthening the Role of Workers and Their Trade Unions;
- Strengthening the Role of Business and Industry;
- Scientific and Technological Community;

- Strengthening the Role of Farmers.

Section IV. Means of Implementation

- Financial Resources and Mechanisms;
 - Transfer of Environmentally Sound Technology, Cooperation, and Capacity-building;
 - Science for Sustainable Development;
 - Promoting Education, Public Awareness, and Training;
 - National Mechanisms and International Cooperation for Capacity-building in Developing Countries;
 - International Institutional Arrangements;
 - International Legal Instruments and Mechanisms;
 - Information for Decisionmaking.
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