Appendix C: References

CHAPTER 1: SUMMARY, ISSUES, AND OPTIONS

- Alfieri, S. A., Jr., Assistant Director, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Tallahassee FL, "Regulatory Pest Control Philosophy: Views and Assessment," paper presented at the meeting of the National Plant Board, Kalispell, MT, August 1991.
- 2. Arner, D. H., Jones, J., and Bucciantini, C., "Carolina Clover: High Prospect for the Conservation Reserve Program, "Journal of Soil and Water Conservation, vol. 47, No. 4, July-August 1992, pp. 292-293.
- 3. Asbury, C. H., "The Orphan Drug Act," *Journal of the American Medical Association*, vol. 265, No. 7, Feb. 20, 1991, pp. 893-897.
- Backiel, A. et al., "The Major Federal Land Management Agencies: Management of Our Nation's Lands and Resources," CRS Report for Congress, 93-197 ENR, Congressional Research Service, Library of Congress, Washington, DC, Feb. 8, 1993.
- 5. Barnard, J., "Forest Slams Shut Wolf-trapping Plans," *Seattle Times*, Jan. 19, 1990.
- Bean, M. J., "TheRoleoftheU.S. Department of the Interior in Non-Indigenous Species Issues," contractor report prepared for the Office of Technology Assessment, November 1991.
- 7, Bergsman, J., "Changes in Pet Regulations Raise Howls," *Seattle Times*, May 12, 1992, p. c-1.
- 8. Britton, J. C., "Pathways and Consequences of the Introduction of Non-Indigenous Freshwater,

- Terrestrial, and Estuarine Mollusks in the United States, 'contractor report prepared for the Office of Technology Assessment, October 1991.
- Brown, L. L., "A Legislative History of Outdoor Recreation User Fees," CRS Report for Congress, 92-645 ENR, Congressional Research Service, The Library of Congress, Washington, DC, Aug. 14, 1992.
- 10, Browning, H.R. and Charudattan, R., Executive Summary of the National Workshop on Regulatory Issues,' Regulations and Guidelines: Critical Issues in Biological Control-Proceedings of a USDA/CSRS National Workshop, R. Charudattan and H.W. Browning (eds.) (Gainesville, FL: Institute of Food and Agricultural Sciences, University of Florida, 1992), pp. 199-201.
- California Department of Food and Agriculture, Division of Plant Industry, "Annual Report," Sacramento, CA, 1990, pp. 16-17.
- 12. Carr, D. A., "Prosecutors Out of Control," *ECO*, vol. 1, No. 1, June 1993, pp. 56, 58.
- 13. Carter, P. C. S., "Risk Assessment and Pest Detection Surveys for Exotic Pests and Diseases Which Threaten Commercial Forestry in New Zealand," New Zealand Journal of Forestry Science, vol. 19, Nos. 2/3, 1989, pp. 353-74.
- 14. Chadwell, J., "Marshall Meyers: The Environment and the Pet Industry," *Pet Product News* (Mission Viejo, CA), vol. 47, No. 5, May 1993, pp. 6-8.
- 15. Comp, T.A. (ed.), Blueprint for the Environment-A Plan for Federal Action (Salt Lake City, UT: Howe Brothers, 1989).

- 16. Cook, A., 'Grub Attack Refund,' *The Washington Post*, Home Section, June 4, 1992, p. 4.
- 17, Nottingham, D., Director, Ecology and Conservation Office, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Washington, DC, letter to P.N. Windle, Office of Technology Assessment, July 31, 1992.
- Nottingham, D., Director, Ecology and Conservation Office, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Washington, DC, memorandum for agency distribution, Jan. 6, 1993.
- Coulson, J.R. and Soper, R. S., 'Protocols for the Introduction of Biological Control Agents in the United States," *Plant Protection and Quaran*tine. Volume III. Special Topics, R.P. Kahn (cd.) (Boca Raton, FL: CRC Press, Inc, 1989), pp. 1-35.
- Council for Agricultural Science and Technology, "Ecological Impacts of Federal Conservation and Cropland Reduction Programs," Task Force Report No. 117, Ames, IA, September 1990
- 21. Counts, C.L. III, "The Zoogeography and History of the Invasion of the United States by *Corbicula Fluminea* (Bivalvia: Corbiculidae), *American Malacological Bulletin*, Special Edition No. 2, 1986, pp. 7-39.
- 22. Courtenay, W. R., Jr., "Fish Introductions and Translocations, and Their Impacts in Australia," *Introduced and Translocated Fishes and Their Ecological Effects*, Proceedings No. 8, Australian Society for Fish Biology Workshop, Magnetic Island, Aug. 24-25, 1989, D.A. Pollard (cd.) (Canberra: Australian Government Publishing Service, 1990), pp. 171-179.
- Courtenay, W. R., Jr., "Pathways and Consequences of the Introduction of Non-Indigenous Fishes in the United States," contractor report prepared for the Office of Technology Assessment, September 1991.
- Courtenay, W. R., Jr., Professor of Zoology, Department of Biological Sciences, Florida Atlantic University, letter to P.N. Windle, Office of Technology Assessment, July 27, 1992.
- 25. Craighead, F. C., Jr. and Dasmann, R. F., "Exotic Big Game on Public Lands" (Washington, DC:

- U.S. Department of the Interior, Bureau of Land Management, 1966).
- 26, Doren, R.F. and Whiteaker, L, D., "The Exotic Pest Plant Council: An Example of Interagency Cooperation To Solve Resource Related Problems," Proceedings of the Symposium on Exotic Pest Plants, T.D. Center et al. (eds.), Technical Report NPS/NREVER/NRTR-91 /-6 (Washington, DC: National Park Service, U.S. Department of the Interior, September 1991), pp. 111-114.
- Dottavio, F.D. et al. (eds.), Protecting Biological Diversity in the National Parks: Workshop Recommendations, Transactions and Proceedings Series No. 9 (Washington, DC: U.S. Department of the Interior, National Park Service, 1990).
- Doyle, P., States as Water Quality Financiers: Legislative Options for the 1990s (Denver, CO: National Conference of State Legislatures, May 1991).
- Drost, C.A. and Fellers, G. M., National Park Service, U.S. Department of the Interior, "Draft Handbook for the Removal of Non-Native Animals," Point Reyes, CA, 1992,
- Edwards, G. E., Assistant Director, Fisheries, U.S. Fish and Wildlife Service, personal communication to Office of Technology Assessment, letter to P.N. Windle, Office of Technology Assessment, Aug. 7, 1992.
- 31. Elston, R. A., 'Effective Applications of Aquaculture Disease-Control Regulations: Recommendations From an Industry Viewpoint, *Dispersal of Living Organisms into Aquatic Ecosystems*, A. Rosenfield and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 353-359.
- 32. Environmental Law Review Committee, "Environmental Legislation: The Increasing Costs of Regulatory Compliance to the City of Columus," report to the Mayor and City Council of the City of Columbus, OH, May 13, 1991.
- Fleming, P., Rock Creek Park, National Park Service, U.S. Department of the Interior, Washington, DC, personal communication to Office of Technology Assessment, Oct. 9, 1991.
- 34. Gallagher, J.E. and Hailer, W. T., "History and Development of Aquatic Weed Control in the United States," *Review of Weed Science*, vol. 5, December 1990, pp. 115-192.

- 36. Glosser, J. W., Administrator, USDA Animal and Plant Health Inspection Service, U.S. Department of Agriculture, testimony at hearings before the Senate Subcommittee on Agricultural Research and General Legislation, Committee on Agriculture, Nutrition, and Forestry, "Preparation for the 1990 Farm Bill: Noxious Weeds," Mar. 28, 1990, pp. 350-354,376-379.
- 37. Glosser, J. W., Director, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, testimony at hearings before the U.S. House Committee on Appropriations, Subcommittee on Agriculture, Rural Development, and Related Agencies, Hearings on Agriculture, Rural Development and Related Agencies Appropriations for 1992: Part 4, Serial No. 43-1710 (Washington, DC: Government Printing Office, May 1991), pp. 271-467.
- Hallerman, E. R., Assistant Professor, Department of Fisheries and Wildlife Sciences, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, personal communication to the Office of Technology Assessment, Mar. 7, 1991.
- Harty, F. M., "How Illinois Kicked the Exotic Habit,' conference on Biological Pollution: the Control and Impact of Invasive Exotic Species, Indiana Academy of Sciences, Indianapolis, IN, Oct. 26, 1991.
- Havens, C., Chief Operations Officer, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville, MD, personal communication to S.M. Fondriest, Office of Technology Assessment, July 23, 1992.
- 41. Hester, F. E., "The U.S. National Park Service Experience With Exotic Species," *Natural Areas Journal*, vol. 11, No. 3, July 1991, pp. 127-128,
- 42. Howarth, F.G. and Medeiros, A. C., "Non-Native Invertebrates," *Conservation Biology in Hawai'i*, C.P. Stone and D.B. Stone (eds.) (Honolulu, HI: University of Hawaii Cooperative National Park Resources Studies Unit, 1989), pp. 82-87.
- 43. Hubbell, S., "Ladybugs," *The New Yorker*, Oct. 7, 1991, pp. 103-111.

- 44. International Union for the Conservation of Nature and Natural Resources, Species Survival Commission in collaboration with the Commision on Ecology and the Commission on Environmental Policy, Law and Administration, "The IUCN Position Statement on Translocation of Living Organisms Introductions, Re-Introductions and Re-Stocking" (Gland, Switzerland: IUCN, 1987).
- 45. Johnson, G., National Park Service, Washington, DC, letter to E.A. Chornesky, Office of Technology Assessment, Sept. 27, 1991.
- 46, Kareiva, P. et al., "Risk Analysis as a Tool for Making Decisions About the Introduction of Non-Indigenous Species Into the United States," contractor report prepared for the Office of Technology Assessment, July 1991.
- 47. Keystone Center, Final Consensus Report of the Keystone Policy Dialogue on Biological Diversity on Federal Lands (Keystone, CO: The Keystone Center, April 1991).
- 48, Kim, K.C. and Wheeler, A. G., Jr., "Pathways and Consequences of the Introduction of Non-Indigenous Insects and Arachnids in the United States," contractor report prepared for the Office of Technology Assessment, December 1991.
- 49, Kludy, D. H., 'Federal Policy on Non-Indigenous Species: The Role of the United States Department of Agriculture's Animal and Plant Health Inspection Service, "contractor report prepared for the Office of Technology Assessment, Washington, DC, December 1991.
- 50. Kludy, D.H., Consultant, Richmond, VA, letter to P.N. Windle, July 30, 1992.
- 51. Kohler, C.C. and Courtenay, W. R., Jr., "American Fisheries Society Position on Introductions of Aquatic Species," *Fisheries*, vol. 11, No. 2, March/April 1986, pp. 39-42.
- 52. Keller, G., "Native Dictates," *Arnoldia*, vol. 52, No. 4, winter 1992, pp. 23-32.
- 53. Keller, G., Senior Horticulturist, Arnold Arboretum, personal communication to K.E. Bannon, Office of Technology Assessment, June 2, 1993.
- 54. Kucewicz, W. P., "Grime and punishment," *ECO*, vol. 1, No. 1, June 1993, pp. 50-55.
- 55. Kurdila, J., "The Introduction of Exotic Species into the United States: There Goes the Neighbor-

- hood!" Boston College Environmental Affairs Law Review, vol. 16, No. 1, 1988, pp. 95-118.
- 56. Langston, A., Animal and Plant Health Inspection Service, Hyattsville, MD, personal communicaion to E.A. Chornesky, Office of Technology Assessment, May 6, 1991,
- 57. Lattin, J., Professor of Entomology, Oregon State University, Corvallis, OR, memorandum to Bill Wright, Administrator, Plant Division, Oregon Department of Agriculture, Salem, OR, Nov. 26, 1991.
- 58. Lederberg, J., Shope, R. E., and Oaks, S. C., Jr. (eds.), Emerging Infections—Microbial Threats to Health in the United States (Washington, DC: National Academy Press, 1992).
- 59. Macdonald, I.A.W. et al., "Wildlife Conservation and the Invasion of Nature Reserves by Introduced Species: Global Perspective," Biological Invasions: A Global Perspective, J.A. Drake et al. (eds) (New York, NY: John Wiley and Sons, 1989), pp. 215-255.
- 60. Mack, R. N., "Pathways and Consequences of the Introduction of Non-Indigenous Plants in the United States," contractor report prepared for the Office of Technology Assessment, September 1991.
- 61, Mack, R. N., Professor and Chair, Department of Botany, Washington State University, Pullman, WA, letter to P.N. Windle, Office of Technology Assessment, Aug. 4, 1992.
- 62. Mack, R. N., "Additional Information on Non-Indigenous Plants in the United States,' contractor report prepared for the Office of Technology Assessment, October 1992.
- 63. McCann, J., Center Director, National Fisheries Research Center, U.S. Fish and Wildlife Service, Gainesville, FL, letter to P.N. Windle, Office of Technology Assessment, Aug. 3, 1992.
- 64. McGregor, R. C., The Emigrant Pests, a report to F.J. Mulhern, Administrator, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, May 1973.
- 65. Mech, L.D., "Wolf/Dog Hybirds," Species— Newsletter of the Species Survival Commission (International Union for the Conservation of Nature), No. 15, December 1990, pp. 66-67.
- 66, Metterhouse, W. M., "Biological Control: State Regulatory View Point,' Regulations and Guide-

- lines: Critical Issues in Biological Control--Proceedings of a USDA/CSRS National Workshop, R. Charudattan and H.W. Browning (eds.) (Gainesville, FL: Institute of Food and Agricultural Sciences, 1992).
- 67. Meyers, M., General Counsel, Pet Industry Joint Advisory Council, Washington, DC, letter to P.T. Jenkins, Office of Technology Assessment, July 29, 1992.
- 68, Miller, D., Research Leader, Systematic Entomology Laboratory, U.S. Department of Agriculture, Agricultural Research Service, Hyattsville, MD, personal communication to E.A. Chornensky, Office of Technology Assessment, Apr. 16, 1991.
- 69. Miller, M. and Aplet, G., "Biological Control: A Little Knowledge Is a Dangerous Thing," Rutgers Law Review, vol. 45, No. 2, winter 1993, pp. 285-334.
- 70. Minnesota Exotic Species Interagency Task Force, Report and Recommendations (St. Paul, MN: State of Minnesota, Department of Natural Resources, July 1991).
- 71. Moody, M.E. and Mack, R. N., "Controlling the Spread of Plant Invasions: the Importance of Nascent Foci, ' The Journal of Applied Ecology, vol. 25, 1988, pp. 1009-1021.
- 72. Nagel, S. S., "Projecting Trends in Public Policy,' Policy Theory and Policy Evaluation, S.S. Nagel (cd.) (WestPort, CT: Greenwood Press, 1990), pp. 161-204.
- 73. National Association of State Departments of Agriculture, 'Honey Bee Pests—A Threat to the Vitality of U.S. Agriculture, 'Washington, DC, February 1991.
- 74. National Fish and Wildlife Foundation, U.S. Fish and Wildlife Service. Fiscal Year 1992 Wildlife and Fisheries Assessment, Washington, DC, April 1991.
- 75. National Parks and Conservation Association, A Race Against Time: Five Threats Endangering America's National Parks and the Solutions to Avert Them (Washington, DC: National Parks and Conservation Association, Aug. 20, 1991).
- 76. National Research Council, Science and the National Parks (Washington, DC: National Academy Press, 1992).

- 77. Nature Conservancy of Hawaii and the Natural Resources Defense Council, "The Alien Pest Species Invasion in Hawaii: Background Study and Recommendations for Interagency Planning," July 1992.
- 78. Neesen, J., U.S. Department of Agriculture, Animals and Plant Health Inspection Service, Budget and Accounting Division, personal communication to Office of Technology Assessment, Nov. 9, 1992.
- 79. North American Native Fishes Association, Introductions Committee, memorandum to D.Lassuy, Intentional Introductions Review Committee, U.S. Aquatic Nuisance Species Task Force, Jan. 25, 1992.
- 80. Noxious Weed Technical Advisory Group, "The Federal Noxious Weed Program Evaluation and Recommendations, report to Deputy Administrator, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Nov. 16,
- 81. Oberheu, J., Staff Specialist, U.S. Fish and Wildlife Service, testimony at hearing on Proposed Injurious Wildlife Regulations before the House Subcommittee on Fisheries and Wildlife, Dec. 12, 1974, p. 108.
- 82. O'Brien, S. J., "Bureaucratic Mischief: Recognizing Endangered Species and Subspecies, 'Science, vol. 251, No. 4998, Mar. 8, 1991, pp. 1187-1188
- 83. Peoples, R. A., Jr., McCam, J. A., and Starnes, L. B., 'Introduced Organisms: Policies and Activities of the U.S. Fish and Wildlife Service, Dispersal of Living Organisms Into Aquatic Ecosystems, A. Rosenfield and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 325-352.
- 84. Reichelderfer, K. H., "The Expanding Role of Environmental Interests in Agricultural Policy,' Resources, No. 102, winter 1991, pp. 4-7.
- 85. Repetto, R. et al., Green Fees: How a Tax Shift Can Work for the Environment and the Economy (Washington, DC: World Resources Institute, November 1992).
- 86. Schmitz, D. C., Florida Department of Natural Resources, Tallahassee, FL, statement submitted at hearings before the Senate Subcommittee on Agricultural Research and General Legislation,

- Committee on Agriculture, Nutrition, and Forestry, "Preparation for the 1990 Farm Bill: Noxious Weeds,' 'Mar. 28, 1990, pp. 357-364.
- 87. Schmitz, D. C., Department of Natural Resources, State of Florida, Tallahassee, FL, personal communication to P.N. Windle, Office of Technology Assessment, June 14, 1993.
- Schneider, K., "Where We Went Wrong on Regulation," *Eco*, June 1993, pp. 16-22.
- Schoulties, C. L., "Pathways and Consequences of the Introduction of Non-Indigenous Plant Pathogens in the United States," contractor report prepared for the Office of Technology Assessment, Washington, DC, December 1991.
- Schoulties, C. L., Director, Division of Regulatory and Public Service Programs, Clemson University, Clemson, SC, personal communication to Office of Technology Assessment, July 31, 1992.
- 91. Schoulties, C. L., Director, Division of Regulatory and Public Service Programs, Clemson University, Clemson, SC, personal communication to P.N. Windle, Office of Technology Assessment, June 14, 1993.
- 92. Schuyler, P. T., Introduced Animal Species Issues: Current Status and Problems Including a Feasibility Study for the Establishment of a Multi-Disciplinary Introduced Animal Species Center, TRI Working Papers No. 56, 56A (New Haven, CT: Yale University School of Forestry and Environmental Studies, 1991).
- Schuyler, P.T., "Non-Indigenous Species in the United States: Selected Analysis of Introduced Animal Species Survey Data, ' contractor report prepared for the Office of Technology Assessment, Washington, DC, December 1991.
- 94. Sellars, R., "The Roots of National Park Management," Journal of Forestry, vol. 90, January 1992, pp. 16-19.
- 95. Shields, E., Funding Environmental Programs: An Examination of Alternatives (Washington, DC: National Governors' Association, 1989).
- 96. Shotkin, A. and McCrea, E. J., "Public Educational Efforts in the United States Regarding Prevention and Management of Non-Indigenous Species, ' contractor report prepared for the Office of Technology Assessment, December 1991.

- 97. Siddiqui, I. A., Assistant Director, California Department of Food and Agriculture, testimony at hearings before the Senate Subcommittee on Federal Services, Post Office, and Civil Service, Committee on Governmental Affairs, "Oversight of the Agricultural Quarantine Enforcement Act (Washington, DC: U.S. Government Printing Office, June 5, 1991), pp. 36-39, 107-111.
- 98. Singletary, H.M., Director, Plant Industry Division, North Carolina Department of Agriculture, Statement submitted with testimony at hearings before the Senate Subcommittee on Agricultural Research and General Legislation, Committee on Agriculture, Nutrition, and Forestry, Mar. 28, 1990, pp. 354-356, 380-382.
- 99. Smart, B. (cd.), "XII. A Look Into the Future," Beyond Compliance—A New Industry View of the Environment (Washington, DC: World Resources Institute, 1992), pp. 235-245.
- 100. Smith, C., Unit Leader, Cooperative National Parks Resources Studies Unit, University of Hawaii at Manoa, Honolulu, HI, letter to Office of Technology Assessment, July 1992.
- 101. **Sprengelmeyer**, E., "Killing to Preserve," *Santa Fe Reporter*, Feb. 10-16, 1993, pp. 17-19.
- 102. Steering Committee for the 75th Symposium, Report of National Parks for the 21st Century—The Vail Agenda, Report and Recommendations to the Director of the National Park Service, National Park Service Document No. D-726, 1992.
- 103. Temple, S. A., "The Nasty Necessity: Eradicating Exotics," *Conservation Biology*, vol. 4, No. 2, pp. 113-115, June 1990.
- 104. Temple, S.A. and Carroll, D. M., "Pathways and Consequences of Introduction of Non-Indigenous Vertebrates in the United States," contractor report prepared for the Office of Technology Assessment, Washington, DC, October 1991.
- 105. Thomas, C., "Reorganizing Public Organizations: Alternatives, Objectives, and Evidence," unpublished report prepared for the Secretary of Energy Advisory Board, U.S. Department of Energy, Washington, DC, August 1992.
- 106. U.S. Congress, House Committee on Appropriations, Subcommittee on Agriculture, Rural De-

- velopment and Related Agencies, Hearings on Agriculture, Rural Development and Related Agencies Appropriations for 1991: Part 4, Serial No. 43-1710, May 1, 1991,
- 107. U.S. Congress, House Committee on Appropriations, Subcommittee on the Department of the Interior and Related Agencies, Hearings on Department of the Interior and Related Agencies Appropriations for 1992, Part 1, Justification of the Budget Estimates (Washington, DC: U.S. Government Printing Office, 1991).
- 108. U.S. Congress, General Accounting Office, *Parks and Recreation*." *Recreation Fee Authorizations, Prohibitions, and Limitations, GAOBCED-86-149* (Washington, DC: GAO, 1986).
- 109. U.S. Congress, General Accounting Office, Wildlife Protection: Enforcement of Federal Laws Could Be Strengthened, GAO/RCED-91-44 (Washington, DC: GAO, April 1991).
- 110. U.S. Congress, General Accounting Office, Pesticides: USDA's Research To Support Registration of Pesticides for Minor Crops, GAO/RCED-92-190BR (Washington, DC: GAO, June 1992).
- 111. U.S. Congress, Joint Committee on Taxation, Present Law and Background Relating to Federal Environmental Tax Policy, JCS-6-90 (Washington, DC: U.S. Government Printing Office, Mar. 1, 1990).
- 112, U.S. Congress, Senate Committee on Agriculture, Nutrition, and Forestry, Subcommittee on Agricultural Research and General Legislation, *Preparation for the 1990 Farm Bill* (Washington, DC: Mar. 28, 1990), pp. 349436.
- 113. U.S. Department of Agriculture, Forest Service, The Report: A Forum for Cooperation, Noxious Weed Workshop, Billings, MT, Feb. 14-17, 1989 (Washington, DC: U.S. Department of Agriculture, May 1989).
- 114. U.S. Department of the Interior, Bureau of Land Management, Vegetation Diversity Project: A Research and Demonstration Program Plan. Restoration and Maintenance of Native Plant Diversity on Deteriorated Range lands. Great Basin and Columbia Plateau (Portland, OR: U.S. Department of the Interior, Bureau of Land Management, Oregon State Office, May 1990).
- 115. U.S. Department of the Interior, Bureau of Land Management, draft report, "Evaluation: Bu-

- reauwide Noxious Weed Program, 'Washington, DC, December 1991.
- 116. U.S. Department of the Interior, Fish and Wildlife Service, internal memorandum from Director to Regional Directors 1-8, Washington, DC, Oct. 20, 1987.
- 117. U.S. Department of the Interior, National Park Service, State of the Parks 1980: A Report to Congress (Washington, DC: Office of Science and Technology, May 1980).
- 118. U.S. Department of the Interior, National Park Service, and U.S. Department of Agriculture, Soil Conservation Service, Native Plants for Parks, D-425 (Washington, DC: U.S. Government Printing Office, 1989).
- 119. U.S. Department of the Intenor, National Park Service, Federal Recreation Fee Report to Congress 1992, Washington, DC, 1992.
- 120. U.S. Department of the Interior, Office of Inspector General, Semiannual Report, Washington, DC, April 1992.
- 121. U.S. Fish and Wildlife Service Law Enforcement Advisory Commission, Report of Findings and Recommendations, Washington, DC, June 15, 1990.
- 122. U.S. Interagency Aquatic Nuisance Species Task Force, Washington, DC, Proposed Aquatic Nuisance Species Program, Sept. 28, 1992.
- 123. Van't Woudt, B. D., "Roaming, Stray, and Feral Domestic Cats and Dogs as Wildlife Problems,' Proceedings of the 14th Vertebrate Pest Conference, L.R. Davis and R.E. Marsh (eds.) (Davis, CA: University of California, 1990), pp. 291-295.
- 124. Washington State Department of Agriculture, Plant Services Division, Plant Quarantine Manual, Seattle, WA, 1992.
- 125. Waterworth, H. E., "Our Plants' Ancestors Immigrated, Too, ' Bioscience, vol. 31, No. 9, October 1981, p. 698.
- 126. West, A. J., Deputy Chief, State and Private Forestry, USDA Forest Service, Washington, DC, personal communication to Office of Technology Assessment, Aug. 24, 1992.
- 127. Westbrooks, R. G., "Interstate Sale of Aquatic Federal Noxious Weeds as Omamentals in the United Sates," Aquatics, June 1990, pp. 16-24.

- 128, Westbrooks, R. G., Station Leader, Whiteville Noxious Weed Station, USDA Animal and Plant Health Inspection Service, Whiteville, NC, letter to P.W. Windle, Office of Technology Assessment, Aug. 11, 1992,
- 129. Westman, W. E., 'Managing for Biodiversity," Bioscience, vol. 40, No. 1, January 1990, pp. 26-33.
- 130, White, R. J., "We're Going Wild: A 30-year Transition from Hatcheries to Habitat," Trout, 30 year anniversary series, summer 1989, pp. 15-49.
- 131. Working Group on Non-Apis Bees, Memorandum to State Departments of Agriculture, W.P. Stephen and R.W. Thorp, Secretaries Pro-Tem., Department of Entomology, Oregon State University, Corvallis, OR, June 2, 1993,
- 132, Yount, J.D. (cd.), Ecology and Management of the Zebra Mussel and Other Introduced Aquatic Nuisance Species, report based on an EPA Workshop, Sept. 26-28, 1990, Saginaw, MI, EPA/600/3 -91-O03 (Washington, DC: U.S. Environmental Protection Agency, Office of Research and Development, February 1991).

CHAPTER 2: THE CONSEQUENCES OF HARMFUL NON-INDIGENOUS SPECIES

- 1. Anonymous, "Count it Quick, Before it's Gone," The Economist, Sept. 14, 1991, vol. 319, No. 7724, pp. **99-100.**
- 2, Bangsund, D.A. and Leistritz, F. L., Department of Agricultural Economics, North Dakota State University, "Economic Impact of Leafy Spurge on Grazing Lands in the Northern Great Plains, Agricultural Economics Report No. 275-5, November 1991.
- 3. Bean, M. J., "The Role of the U.S. Department of the Interior in Non-Indigenous Species Issues," contractor report prepared for the Office of Technology Assessment, Washington, DC, November 1991.
- 4. Bedunah, D. J., "The Complex Ecology of Weeds, Grazing and Wildlife,' Western Wildlands, VOL 18, No. 2, summer 1992, pp. 6-11.
- 5. Bergsman, J., "Changes in Pet Regulations Raise Howls," Seattle Times, May 12, 1992, p. c-1.

- Brenchley, G.A. and Carlton, J.T., "Competitive Displacement of Native Mud Snails by Introduced Periwinkles in the New England Intertidal Zone," *Biological Bulletin*, vol. 165, December 1983, pp. 543-558,
- Britton, J. C., "Pathways and Consequences of the Introduction of Freshwater, Terrestrial, and Estuarine Mollusks in the United States," contractor report prepared for the Office of Technology Assessment, October 1991.
- Cochran, M. J., "Non-Indigenous Species in the United States: Economic Consequences,' contractor report prepared for the Office of Technology Assessment, March 1992.
- Conant, S., "Saving Endangered Species by Translocation—Are we Tinkering with Evolution?" Bioscience, vol. 38, No. 4, 1988, pp. 254-57.
- Courtenay, W., "Pathways and Consequences of the Introduction of Non-Indigenous Fishes in the United States," contractor report prepared for the Office of Technology Assessment, September 1991.
- 11. D'Antonio, C.M. and Vitousek, P. M., "Biological Invasions by Exotic Grasses, the Grass/Fire Cyclel, and Global Change," *Annual Review of Ecology and Systematics*, vol. 23, 1992, pp. 63-87.
- 12. Dickerson, W. A., "Gypsy Moth in the Southeastern United States," North Carolina Department of Agriculture report, Raleigh, NC, Apr. 16, 1991,
- 13. Dowling, T.E. and Childs, M.R., "Impact of Hybridization on a Threatened Trout of the Southwestern United States," *Conservation Biology*, vol. 6, No. 3, September 1992, pp. 355-364.
- 14. Edwards, G.B. and Nottingham, D., Co-Chairs of the Aquatic Nuisance Species Task Force, letter to E.A. Chornesky, Office of Technology Assessment, Nov. 25, 1992.
- 15. Engbring, J. and Fritts, T.H., "Demise of an Insular Avifauna: The Brown Tree Snake on Guam," *Transactions of the Western Section of the Wildlife Society*, vol. 24, 1988, pp. 31-37.
- Ervin, K., "The Brink of Extinction," The Seattle Times/Seattle Post-Intelligencer, Nov. 25, 1990, pp. Al, A16.

- 17. Evangelou, P., Agricultural Economist, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, letters to Office of Technology Assessment, Dec. 9, 1991 and Jan. 7, 1992, with attachment summarizing informaion from the APHIS Fiscal Year 1990 Budget Witness Book.
- 18. Fergus, C., "The Florida Panther Verges on Extinction," Science, vol. 251, Mar. 8, 1991, pp. 1178-1180.
- Fey, C.L. et al., "History of Weed Introductions," Exotic Plant Pests and North American Agriculture, C.L. Wilson and C.L. Graham (eds.) (New York, NY: Academic Press, 1983), pp. 65-92.
- 20. Gallagher, J.E. and Hailer, W. T., "History and Development of Aquatic Weed Control in the United States," *Review of Weed Science*, vol. 5, 1990, pp. 115-192,
- Gangstad, E.O. and Cardarelli, N. F., "The Relation Between Aquatic Weeds and Public Health," Aquatic Weeds: The Ecology and Management of Nuisance Aquatic Vegetation, A.H. Pieterse and K.J. Murphy (eds.) (New York, NY: Oxford University Press, 1990), pp. 85-90.
- 22. Ganzhorn J. et al., "Dissemination of Microbial Pathogens Through Introductions and Transfers of Fish fish," *Dispersal of Living Organisms Into Aquatic Ecosystems*, A. Rosenfield and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 175-192.
- 23. Goodman, B., "Keeping Anglers Happy Has a Price," *Bioscience*, vol. 41, No. 5, May 1991, pp. 294-299.
- 24. Great Lakes Fishery Commission, "Ruffe in the Great Lakes: A Threat to North American Fisheries," Report of the Ruffe Task Force, Ann Arbor, MI, March 1992.
- Hadfield, M.G. and Miller, S.E., "Alien Predators and Decimation of Endemic Hawaiian Tree Snails," *Pacific Science*, vol. 46, No. 3, 1992, p. 395.
- 26. Haughton, C. S., *Green Immigrants: The Plants that Transformed America (New York, NY: Harcourt Brace Jovanovich, 1978).*
- 27. Hester, F. E., "The U.S. National Park Service Experience with Exotic Species, *Natural Areas*

- Journal, vol. 11, No. 3, July 1991, pp. 127-128.
- 28. Horbold, B. and Moyle, P. B., "Introduced Species and Vacant Niches, *The American Naturalist*, vol. 128, No. 5, November 1986, pp. 751-760.
- 29. Howarth, F.G. and Rarnsay, G.W., "The Conservation of Island Insects and Their Habitats," *The Conservation of Insects and Their Habitats*, N.M. Collins and J.A. Thomas (eds.) (New York, NY: Academic Press, 1991), pp. 71-107.
- Johnston, G. H., Chief of Wildlife and Vegetation Division, Natural Resources Program Branch, National Park Service, U.S. Department of the Interior, personal communications to Office of Technology Assessment, July 10, 1991 and Mar. 13, 1992.
- 31. Kass, H., "Once a Savior, Moth is Now a Scourge, *Plant Conservation*, vol. 5, *No.* 2, summer 1990, p. 3.
- 32. Kay, S. H., "Hydrilla, a Rapidly Spreading Aquatic Weed Problem in North Carolina," Agriculture Bulletin—AG-449, North Carolina Cooperative Extensive Service (Raleigh, NC: North Carolina State University, May 1992).
- Kim, K.C. and Wheeler, A. G., Jr., "Pathways and Consequences of the Introduction of Non-Indigenous Insects and Arachnids in the United States, contractor report prepared for the Office of Technology Assessment, December 1991.
- 34. Klassen, W., "Eradication of Introduced Arthropod Pests: Theory and Historical Practice," Entomological Society of America, Miscellane - ous Publications, vol. 73, 1989, pp. 1-29,
- 35. Langdon, K.R. and Johnson, K. D., 'Alien Forest Insects and Diseases in Eastern USNPS Units: Impacts and Interventions,' *The George Wright Forum*, vol. 9, No. 1, 1992, pp. 2-14.
- Lanka, B., 'Analysis and Recommendations on the Applications by Mr. John T. Dorrence III to Import and Possess Native and Exotic Species,' Wyoming Game and Fish Department, Cheyenne, Wyoming, Mar. 1, 1990,
- Leonard, K., Director, Cereal Rust Lab, University of Minnesota, U.S. Department of Agriculture, St. Paul, MN, letter to P.N. Windle, Office of Technology Assessment, Jan. 3, 1992,
- 38. Lodge, D. M., "Species Invasions and Deletions: Community Effects and Responses to Climate

- and Habitat Change, ' *Biotic Interactions and Global Change* (Sunderland, MA: Sinauer and Assoc., 1993).
- Loope, L.L. and Sanchez, P. G., "Biological Invasions of Arid Land Nature Reserve," *Biologi*cal Conservation, vol. 44, 1988, pp. 95-118.
- Luoma, J. R., "Boon to Anglers Turns Into a Disaster for Lakes and Streams," New York Times, Nov. 17, 1992.
- 41. Macdonald, I.A.W. et al., "Wildlife Conservation and the Invasion of Nature Reserves by Introduced Species: Global Perspective," *Biological Invasions: A Global Perspective*, J.A. Drake et al. (eds.) (New York, NY: John Wiley and Sons, Ltd., 1989), pp. 215-255.
- Mace, G.M. and Lande, R., "Assessing Extinction Threats: Toward a Reevaluation of IUCN Threatened Species Categories," *Conservation Biology*, vol. 5, No. 2, June 1991, pp. 148-157.
- Mack, R. N., "Pathways and Consequences of the Introduction of Non-Indigenous Plants in the United States," contractor report prepared for the Office of Technology Assessment, September 1991.
- 44. Mack, R. N., Chairman, Department of Botany, Washington State University, Pullman, WA, personal communication to P.N. Windle, Office of Technology Assessment, Aug. 4, 1992.
- 45. Marsh, P.C. and Langhorst, D. R., "Feeding and Fate of Wild Larval Razorback Sucker,' *Environmental Biology of Fishes*, vol. 21, No. 1, 1988, pp. 59-67.
- Master, L., "Aquatic Animals: Endangerment Alert," *Nature Conservancy*, March/April 1991, pp. 26-27.
- 47. Mayer, J.J. and Brisbin, I. L., Jr., Savannah River Ecology Laboratory, Aiken, South Carolina, "Wild Pigs in the United States: Their History, Comparative Morphology, and Current Status" (Athens, GA: University of Georgia Press, 1991).
- 48. McCann, J. A., "Involvement of the American Fisheries Society with Exotic Species, 1969-1982," *Distribution, Biology, and Management* of Exotic Fishes, W.R. Courtenay, Jr. and J.R. Stauffer, Jr. (eds.) (Baltimore, MD: Johns Hopkins University Press, 1984), pp. 1-7,
- 49. McCrea, E.J. and Shotkin, A., "Public Educational Efforts in the United States Regarding

- Prevention and Management of Non-Indigenous Species,' contractor report prepared for the Office of Technology Assessment, December 1991.
- 50. McKey, D.B. and Kaufmann, S. C., "Naturalization of Exotic Ficus Species (Moraceae) in South Florida," Department of the Interior, National Park Service, Technical Report NPS/NREVER/ NRTR-91/06, September 1991.
- 51. McNab, W. H., "Oriental Bittersweet: Another Kudzu?" Proceedings of the 16th Annual Hardwood Symposium (Cashiers, NC: Hardwood Research Council, 1988), pp. 190-191.
- 52. Mech, L. D., "Wolf/Dog Hybrids," Species (Newsletter of the Species Survival Commission of IUCN—World Conservation Union), Brookfield, IL, No. 15, December 1990, pp. 66-67.
- 53. Minnesota Interagency Exotic Species Task Force, "Report and Recommendations," submitted to the Natural Resources Committees of the Minnesota House and Senate, St. Paul, MN, July 1991.
- 54. Missouri Department of Natural Resources, "Challenge of the '90s: Our Threatened State Parks," Jefferson City, MO, October 1991.
- 55. Mitchell, C.J. et al., "Isolation of Eastern Equine Encephalitis Virus From Aedes albopictus in Florida," Science, vol. 257, July 24, 1992, pp.
- 56. Mooney, H.A. and Drake, J. A., "Biological Invasions: a SCOPE Program Overview, " Biological Invasions: A Global Perspective, J.A. Drake et al. (eds.) (New York, NY: John Wiley and Sons, 1989), pp. 491-506.
- 57. Moyle, P. B., Li, H.W., and Barton, B.A. "The Frankenstein Effect: Impact of Introduced Fishes on Native Fishes in North America, " Fish Culture in Fisheries Management, R.H. Stroud (cd.) (Bethesda, MD: American Fisheries Society, 1986), pp. 415-426.
- 58. Moyle, P.B. and Williams, J. E., "Biodiversity Loss in the Temperate Zone: Decline of the Native Fish Fauna of California," Conservation Biology vol. 4, No. 3, September 1990, pp. 275-284.
- 59. National Association of State Departments of Agriculture, 'Honey Bee Pests—A Threat to the

- Vitality of U.S. Agriculture, "Washington, DC, February 1991.
- 60. Nature Conservancy of Hawaii and the Natural Resources Defense Council, "The Alien Pest Species Invasion in Hawaii: Background Study and Recommendations for Interagency Planning," July 1992.
- 61. Neill, W.M., "The Tarnarisk Invasion of Desert Riparian Areas,' CalEPPC News, vol. 1, No. 1, winter 1993, pp. 6-7.
- 62. O'Brien, S.J., "Bureaucratic Mischief: Recognizing Endangered Species and Subspecies, ' Science, vol. 251, Mar. 8, 1991, pp. 1187-88.
- 63. Paul, J., Communications Director, National Pest Control Association, personal communication, Oct. 30, 1992.
- 64. Peine, J.D. and Farrner, J.A., "Wild Hog Management Program at Great Smoky Mountains National Park," Proceedings of the 14th Vertebrate Pest Conference, L.R. Davis and R.E. Marsh (eds.) (Davis, CA: University of California, 1990), pp. 221-227.
- 65. Perdue, R. E., Jr. and Christenson, G. M., "Plant Exploration, " Plant Breeding Reviews: Volume 7 The National Plant Germplasm System of the United States, J. Janick (cd.) (Portland, OR: Timber Press, 1989), pp. 67-94.
- 66. Pimentel, D.H. et al., "Environmental and Economic Effects of Reducing Pesticide Use, ' Handbook on Pest Management in Agriculture, D.H. Pimentel (cd.) (Boca Raton, FL: CRC Press, 1991).
- 67. Sailer, R. I., "History of Insect Introductions," Exotic Plant Pests and North American Agriculture, C.L. Wilson and C.L. Graham (eds.) (New York, NY: Academic Press, 1983), pp. 15-38.
- 68. Savidge, J.A., "Extinction of an Island Forest Avifauna by an Introduced Snake," Ecology, vol. 68, No. 3, 1987, pp. 660-668.
- 69. midt, B. R., Chief of Fisheries, Division of Wildlife Resources, Utah Department of Natural Resources, Salt Lake City, UT, letter to P.N. Windle, Office of Technology Assessment, Dec. 16, 1991.
- 70. Schmitz, D.C. et al., "The Ecological Impact of Three Invasive Alien Plant Species in Florida: A Review,' unpublished manuscript.

- 71. Schoener, A. A., "TheRole of Competition in the Replacement of Native Fishes by Introduced Species," Fishes in North American Deserts, R.J. Naiman and D.L. Soltz (eds.) (New York, NY: John Wiley and Sons, 1981), pp. 173-203,
- 72. Schoulties, C. L., "Pathways and Consequences of the Introduction of Non-Indigenous Plant Pathogens in the United States," contractor report prepared for the Office of Technology Assessment, Washington, DC, December 1991.
- 73. Showier, A.T. and Reagan, T. E., "Ecological Interactions of the Red Imported Fire Ant in the Southeastern United States," *J. Entomol. Sci. Suppl.*, vol. 1, 1987, pp. 52-64.
- 74. Soulé, M. E., "Conservation: Tactics for a Constant Crisis," *Science*, vol. 253, Aug. 16, 1991, pp. 744-750.
- 75. Spaulding, W. M., Jr. and McPhee, R. J.—Bi-National Evaluation Team (submitted by), "The Report of the Evaluation of the Great Lakes Fishery Commission by the Bi-National Evaluation Team: Volume 2, An Analysis of the Economic Contribution of the Great Lakes Sea Lamprey Program" (Twin Cities, MN: U.S. Fish and Wildlife Service, Nov. 28, 1989).
- 76. Spencer, C.N. et al., "Shrimp Stocking, Salmon Collapse, and Eagle Displacement," *Bioscience*, vol. 41, No. 1, January 1991, pp. 14-21.
- 77. Struzik, E., "The Game Ranch," *International Wildlife*, vol. 22, July/August 1992, pp. 18-20, 22-24.
- 78. Taylor, O. R., Jr., "African Bees: Potential Impact in the United States," *Bulletin of the Entomological Society of America*, winter 1985, pp. 14-24.
- 79. Temple, S.A. and Carroll, D. M., "Pathways and Consequences of Introduction of Non-Indigenous Vertebrates in the United States," contractor report prepared for the Office of Technology Assessment, October 1991.
- 80. Terborgh, J., "Why American Songbirds are Vanishing," *Scientific American*, May 1992, pp. 98-104.
- 81. Texas Department of Agriculture, Agriculture Development Program, "Exotic Game in Texas: An Overview of Commercial Potential, 'Austin, TX, February 1989.

- 82. Thomas, L. K., Jr., "The Impact of Three Exotic Plant Species on Potomac Island," U.S. Department of the Interior, National Park Service Scientific Monograph Series, No. 13, Washington, DC, 1980.
- 83. Thompson, D.Q. et al., "Spread, Impact, and Control of Purple Loosestrife (*Lythrum salicaria*) in North American Wetlands, United States Fish and Wildlife Service, Washington, DC, 1987.
- 84. Toland, B., "Use of Forested Spoil Islands by Nesting American Oystercatchers in Southeast Florida," *Journal of Field Ornithology*, vol. 63, No. 2, spring, 1992, pp. 155-158.
- 85. Turner, C. E., "Conflicting Interests and Biological Control of Weeds," *Proc. IV Int. Symp. Biol. Contr. Weeds*, August 1984, pp. 203-225.
- 86. U.S. Congress, General Accounting Office, "Great Lakes Fishery Commission—Actions Needed to Support an Expanded Program," NSIAD-92-108 (Gaithersburg, MD: U.S. General Accounting Office, March 1992).
- 87. U.S. Congress, Office of Technology Assessment, *Technologies To Maintain Biological Diversity*, OTA-F-330 (Washington, DC: U.S. Government Printing Office, March 1987),
- 88. U.S. Congress, Office of Technology Assessment, *Bioremediation for Marine Oil Spills-Background Paper*, OTA-BP-O-70 (Washington, DC: U.S. Government Printing Office, May 1991).
- 89. U.S. Department of Agriculture, "Kudzu for Erosion Control in the Southeast," Farmer's Bulletin No. 1840, 1944.
- 90. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, "Imported Fire Ant: A Guide for Nursery Operators," program aid no. 1420, 1989.
- 91. U.S. Department of Agriculture, Forest Service, "Pest Risk Assessment of the Importation of Larch from Siberia and the Soviet Far East," Miscellaneous Publication No. 1495, September 1991.
- 92. U.S. Department of Agriculture, Forest Service, "Forest Service Manual 2600-Wildlife, Fish, and Sensitive Plant Habitat Management WO Amendment 2600-91 -6," Sept. 24, 1991.

- **93.** U.S. Department of Agriculture, Soil Conservation Service, "Improved Conservation Plant Materials Released by the SCS and Cooperators Through December 1990," 1990.
- 94. U.S. Department of the Interior, Bureau of Reclamation, Lower Colorado Region, "Vegetation Management Study—Lower Colorado River," Phase I, September 1992.
- U.S. Department of the Interior, Fish and Wildlife Service, Restoring America's Wildlife, (Washington, DC: U.S. Government Printing Office, 1987).
- 96. von Broembsen, S. L., "Invasions of Natural Ecosystems by Plant Pathogens," *Biological Invasions: a Global Perspective (New York*, NY: John Wiley and Sons, 1989), pp. 77-83.
- 97. Webb, D. A., "What Are the Criteria for Presuming Native Status?, *Watsonia*, vol. 15,1985, pp. 231-236.
- Westbrooks, R. G., Poisonous Plants of Eastern North America (Columbia, SC: University of South Carolina Press, 1986).
- 99. Westman, W. E., "Managing for Biodiversity— Unresolved Science and Policy Questions," *Bioscience*, vol. 40, No. 1, 1990, pp. 26-33.
- 100. Whitson, T.D. et al., *Weeds of the West* (Jackson, WY: Pioneer of Jackson Hole, January 1991).
- 101. Williams, M. C., "Purposefully Introduced Plants that Have Become Noxious or Poisonous Weeds," "Weed Science, vol. 28, No. 3, May 1980, pp. 300-305.
- 102. Young, J. A., "Tumbleweed," *Scientific American*, March 1991, pp. 82-87,

CHAPTER 3: THE CHANGING NUMBERS, CAUSES, AND RATES OF INTRODUCTIONS

- American Fisheries Society, Southern Division, "Newsletter," Virginia Polytechnic Institute and State University, Blacksburg, VA, February 1991.
- **2.** Anonymous, "Hazards of Travel," *Washington Post*, Dec. 31, 1991, p. C2.
- **3.** Anonymous, 'Around the States: Florida,' *Ecology USA*, vol. 21, No. 7, Apr. 6, 1992, p. 67.
- **4.** Anonymous, 'Search On for Snail That Eats Up Lawns," *Washington Times*, May 15, 1992, p. B3.

- Bandel, D. M., Chief, Natural and Cultural Resources Division Directorate of Public Works, Department of the Army, Fort Belvoir, VA, memorandum to the Executive Director, Armed Forces Pest Management Board, Forest Glen Section, Feb. 4, 1992.
- Bangsund, D.A. and Leistritz, F.L., "Economic Impacts of Leafy Spurge on Grazing Lands in the Northern Great Plains,' Department of Agricultural Economics, Agricultural Experiment Station, North Dakota State University, Fargo, ND, Agricultural Economics Report No. 275-S, November 1991.
- 7. Barton, B. J., *Gardening by Mail: a Source Book* (Boston, MA: Houghton Mifflin Co., 1990).
- Beauchamp, R. M., President, Pacific Southwest Biological Services, Inc., letter to P.T. Jenkins, Office of Technology Assessment, Dec. 27, 1991
- 9. **Bedunah**, D.J., 'The Complex Ecology of Weeds, Grazing, and Wildlife,' *Western Wildlands*, vol. 18, No, 2, summer 1992, pp. 6-11.
- Bossard, C., "The Establishment and Dispersal of *Cytisus scoparius* (Scotch Broom) in California Sierra Nevada Foothill and Northern Coastal Habitats," *Proceedings of the Symposium on Exotic Pest Plants*, T.D. Center et al. (eds.) (Denver, CO: National Park Service, Natural Resources Publication Office, 1991), pp. 35-55.
- 11. Boyce, J. S., *Forest Pathology (New York*, NY: McGraw-Hill Book Co., Inc., 1961).
- 12. Britton, J. C., "Pathways and Consequences of the Introduction of Non-Indigenous Freshwater, Terrestrial, and Estuarine Mollusks in the United States,' contractor report prepared for the Office of Technology Assessment, October 1991.
- 13. Burkhead, N.M. and Williams, J. D., "An Intergenic Hybrid of a Native Minnow, the Golden Shiner, and an Exotic Minnow, the Rudd," *Transactions of the American Fishery Society*, vol. 120, 1991, pp. 781-795, as cited in Mills, E.L. et al., 1993 (#71).
- California Exotic Plant Pest Council, *CalEPPC News*, vol. 1, No. 1, winter 1993, p. 5.
- California Forest Pest Council, "Forest Pest Conditions in California-1991," Sacramento, CA, Feb. 28, 1992.

- 16. Cardoza, J.E. et al., "A Compilation of the History and Status of Exotic Vertebrates of Massachusetts," Fauna of Massachusetts Series, No. 6, Massachusetts Division of Fisheries and Wildlife, Westborough, MA, September 1992.
- Carlton, J. T., "Introduced Invertebrates of San Francisco Bay,' San Francis coBay: The Urbanized Estuary (San Francisco, CA: Pacific Division of the American Association for the Advancement of Science, 1979), pp. 427444.
- Carlton, J. T., Director, Maritime Studies Program, Williams College, Mystic, CT, personal communication to E.A. Chornesky, Office of Technology Assessment, December 1990.
- Carlton, J. T., "Dispersal of Living Organisms into Aquatic Ecosystems as Mediated by Aquaculture and Fisheries Activities," *Dispersal of Living Organisms Into Aquatic Ecosystems*, A, Rosenfield and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 13-46.
- Carlton, J. T., "Marine Species Introductions by Ship's Ballast Water: An Overview,' *Introductions and Transfers of Marine Species*, M.R. DeVoe (cd.) (Charleston, SC: South Carolina Sea Grant, 1992), pp. 23-29.
- Carlton, J.T. et al., "Remarkable Invasion of San Francisco Bay (California, USA) by the Asian Clam *Potamocorbula amurensis*. I. Introduction and Dispersal, ' *Marine Ecology Progress Series*, vol. 66, 1990, pp. 81-94.
- 22. Carlton, J.T. and Geller, J. B., "Ecological Roulette: The Global Transport of Nonindigenous Marine Organisms," *Science*, vol. 261, July 2, 1993, pp. 78-82.
- 23. Center for Conservation Biology, *Center for Conservation Biology Update*, Stanford University, Stanford, CA, vol. 6, No. 2, winter **1993**, p. 12.
- Cochran, M. J., "Non-Indigenous Species In the United States: Economic Impact Tables," contractor report prepared for the Office of Technology Assessment, March 1992.
- Counts, C.L. III, "The Zoogeography and History of the Invasion of the United States by Corbicula Fluminea (Bivalvia: Corbiculidae),"
 American Malacological Bulletin, Special Edition No. 2, 1986, pp. 7-39,

- 26, Courtenay, W. R., "Pathways and Consequences of the Introduction of Non-Indigenous Fishes in the United States," contractor report prepared for the Office of Technology Assessment, September 1991.
- Courtenay, W.R., Professor of Zoology, Florida Atlantic University, Boca Raton, FL, FAX to E.A. Chornesky, Office of Technology Assessment, Apr. 13, 1993.
- 28. Courtenay, W.R. and Robins, C.R., "Fish Introductions: Good Management, Mismanagement, or No Management," *Critical Reviews in Aquatic Sciences*, vol. 1, No. 1, 1989, pp. 159-172.
- 29. Courtenay, W.R. and Williams, J. D., "Dispersal of Exotic Species From Aquiculture Sources, With Emphasis on Freshwater Fishes," *Disper*sal of Living Organisms into Aquatic Ecosystems, A. Rosenfield and R. Mam (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 49-81.
- 30. Craven, R.B. et al., "Importation of Aedes albopictus and Other Exotic Mosquito Species into the United States in Used Tires From Asia," Journal of the American Mosquito Control Association, vol. 4, No. 2, 1988, pp. 138-142.
- 31. Deitrich, B., "State Girds To Battle Alien Invader: A Moth," *Seattle Times, Nov. 19,1991*, p. A-1.
- 32. Dickerson, W. A., "Gypsy Moth in the Southeastern United States," North Carolina Department of Agriculture, Raleigh, NC, Apr. 16, 1991.
- 33. Dold, C., 'Exotic Birds, at Risk in Wild, Maybe Banned as Imports to U.S.," *The New York Times*, Oct. 20, 1992.
- 34. Dowell, R.V. and Gill, R., "Exotic Invertebrates and Their Effects on California, ' *Pan-Pacific Entomologist*, vol. 65, No. 2,1989, pp. 132-145.
- Dowell, R. V., State Entomologist, California Department of Food and Agriculture, Sacramento, CA, FAX to E.A. Chornesky, Office of Technology Assessment, Apr. 12, 1993.
- 36. Ebinger, J.E. and McClain, W. E., "Naturalized Amur Maple (*Acer ginnala* Maxim.) in Illinois," *Natural Areas Journal, vol.* 11, No. 3, 1991, pp. 170-171.
- 37. Ezzell, C., 'Strangers in Paradise," *Science News*, vol. 142, No. 45, Nov. **7**, **1992**, pp. **314-319**.

- 38. Fisher, T.W., personal communication to J.C. Britton, as cited in Britton, J. C., 1991 (#12).
- 39. Fleming, P. and Kanal, R., "Newly Documented Species of Vascular Plants in the District of Columbia," *Castanea*, vol. 57, No. 2, June 1992, pp. 132-146,
- 40. Frankie, G.W. et al. "Some Considerations for the Eradication and Management of Introduced Insect Pests in Urban Environments," S.L. Batten field (cd.) Proceedings of a Symposium on the Imported Fire Ant, Atlanta, GA, June 7-10, 1982 (Washington, DC: U.S. Department of Agriculture, Animal and Plant Health Inspection Service/U.S. Environmental Protection Agency, 1982) as cited in K.C. Kim and A.G. Wheeler, Jr., 1991 (#53).
- 41. Fritts, T. H., "The Brown Tree Snake, *Boiga irregulars*, A Threat to Pacific Islands," U.S. *Fish and Wildlife Service Biological Report*, vol. 88, No. 31, September 1988.
- 42. Ganzhorn, J. et al., "Dissemination of Microbial Pathogens Through Introductions and Transfers of Fin fish," *Dispersal of Living Organisms into Aquatic Ecosystems*, A. Rosenfield and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 175-192.
- 43. Great Lakes Fishery Commission, Ruffe Task Force, "Ruffe in the Great Lakes: A Threat to North American Fisheries," Ann Arbor, MI, March 1992.
- 44. Greathead, D.J. and Greathead, A. H., 'Biological Control of Insect Pests by Insect Parasitoids and Predators: the BIOCAT Database, Biocontrol News and Information 1992, vol.13, No. 4, 1992, pp. 61 N-68N.
- Gregg, M., Administrator, Metro Parks Natural Areas Management, State of Florida, memo to K. Hale, Director, Office of Emergency Management, Oct. 11, 1992.
- Hanna, G. D., "Introduced Mollusks of Western North America," Occasional Papers of the California Academy of Sciences, No. 48, 1966, as cited in Britton, J. C., 1991 (#12).
- 47. Hobbs, R.J. and Huenneke, L. F., "Disturbance, Diversity, and Invasion: Implications for Conservat ion,' *Conservation Biology*, vol. 6, No, 3, September 1992, pp. 324-337.

- 48. Hoffman, G. L., "The Asian Tapeworm, Bothriocephalus gowkongensis, in the United States, and Research Needs in Fish Parasitology," Proceedings of the 1976 Fish Farming Conference and Annual Convention of Catfish Farmers of Texas, Texas A&M University, College Station, TX, July 20-21, 1976, pp. 84-90.
- Hofstetter, RH., "The Current Status of Melaleuca quinquenervia in Southern Florida," Proceedings of the Symposium on Exotic Pest Plants, T.D. Center et al. (eds.) (Denver, CO: National Park Service, Natural Resources Publication Office, 1991), pp. 159-176.
- 50. Howard, L.O., "Gipsy Moth in America: A Summary Account of the Introduction and Spread of *Porthetria dispar in Massachusetts* and of the Efforts Made by the State to Repress and Exterminate It," U.S. Department of Agriculture, Division of Entomology, Bulletin No. n-New Series, 1897, pp. 1-39.
- 51. Hubbell, S., "A Reporter at Large: Ladybugs," *The New Yorker*, Oct. **7**, **1991**, pp. 103-111.
- 52. Kaplan, J. K., "Africanized Honey Bees," *Agricultural Research*, vol. 38, December 1990, pp. 4-11,
- 53. Kim, K.C. and Wheeler, A. G., "Pathways and Consequences of the Introduction of Non-Indigenous Insects and Arachnids in the United States," contractor report prepared for the Office of Technology Assessment, December 1991.
- 54. Kindler, S.D. and Springer, T. L., "Alternate Hosts of Russian Wheat Aphid (Homoptera: Aphididae)," *Journal of Economic Entomology*, vol. 82, No. 5, 1989, pp. 1358-1362.
- 55, Kohler, C.C. and Courtenay, W., Jr., "American Fisheries Society Position on Introductions of Aquatic Species," *Fisheries*, vol. 11, No. 2, March-April 1986, pp. 39-42.
- Langdon, K.R. and Johnson, K. D., 'Alien Forest Insects and Diseases in Eastern USNPS Units: Impacts and Interventions,' The George Wright FORUM, vol. 9, No. 1, 1992, pp. 2-14.
- 57. Lanka, B. et al., "Analysis and Recommendations on the Application by Mr. John T. Dorrance III to Import and Possess Native and Exotic Species," Exotic Species Committee, Game Division, Wyoming Game and Fish Department, Cheyenne, WY, Mar. 1, 1990,

- 59_{*} Lieberman, S. S., "Awareness Grows on the Problems of Trading Live Birds and Other Live Wildlife, ' *Endangered Species Technical Bulle*tin, vol. 15, No. 11, 1990, pp. 13-14.
- 60. Lightner, D.V. et al., "Geographic Dispersion of the Viruses IHHN, MBV, and HPV as a Consequence of Transfers and Introductions of Penaeid Shrimp to New Regions for Aquiculture Purposes," Dispersal of Living Organisms into Aquatic Ecosystems, A. Rosenfield and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 155-173.
- Lombardi, A. K., Director, Office of Cargo Enforcement and Facilitation, Department of Customs, U.S. Department of the Treasury, Washington, DC, personal communication to Office of Technology Assessment, Jan, 24, 1992.
- 62, Mack, R. N., "Catalog of Woes," *Natural History*, March 1990, pp. 44-53.
- 63. Mack, R. N., "Pathways and Consequences of the Introduction of Non-Indigenous Plants in the United States," contractor report prepared for the Office of Technology Assessment, September 1991.
- 64. Mack, R. N., "The Commercial Seed Trade: An Early Disperser of Weeds in the United States," *Economic Botany*, vol. 45, No. 2, 1991, pp. 257-273.
- Mack, R. N., "Additional Information on Non-Indigenous Plants in the United States,' contractor report prepared for the Office of Technology Assessment, October 1992.
- 66. McCann, J. A., "Involvement of the American Fisheries Society With Exotic Species, 1969-1982," *Distribution, Biology, and Management* of Exotic Fishes, W.R. Courtenay and J.R. Stauffer, Jr. (eds.) (Baltimore, MD: The Johns Hopkins University Press, 1984), pp. 1-7.
- 67. McCann, J. A., Director, National Fisheries Research Center, Fish and Wildlife Service, U.S. Department of the Interior, Gainesville, FL, personal communication to Office of Technology Assessment, Apr. 17, 1991.

- 68. McClintock, E., "Escaped Exotic Weeds in California," *Fremontia*, vol. 12, No. 4, January 1985, pp. 3-6.
- 69. McCoid, M. and Fritts, T.H., "Growth and Fatbody Cycles in Feral Populations of the African Clawed Frog, *Xenopus laevis* (Pipidae), in California With Comments on Reproduction," *The Southwestern Naturalist*, vol. 34, No. 4, December 1989, pp. 499-505.
- McMullen, M. M., Inspector-Program Officer, Office of Cargo Enforcement and Facilitation, Department of Customs, U.S. Department of the Treasury, Washington, DC, personal communicaion to Office of Technology Assessment, Jan. 24, 1992.
- Mills, E.L. et al., "Exotic Species in the Great Lakes: A History of Biotic Crises and Anthropogenic Introductions," *Journal of Great Lakes Research*, vol. 19, No. 1, 1993, pp. 1-54.
- 72. Morrison, J., "Cockroaches on the Move," *Agricultural Research, vol. 35, No. 2,* February 1987, pp. 6-9.
- 73, Moyle, P. B., "Fish Introductions in California: History and Impact on Native Fishes,' *Biological Conservation*, vol. 9, No. 2, 1976, pp. 101-118,
- 74. National Association of State Departments of Agriculture, Washington, DC, 'Honey Bee Pests —A Threat to the Vitality of U.S. Agriculture: A National Strategy," February 1991.
- 75. Nichols, F.H. et al., "Remarkable Invasion of San Francisco Bay (California, USA) by the *Asian Clam Potamocorbula amurensis: II.* Displacement of a Former Community, *Marine Ecology Progress Series*, vol. 66, 1990, pp. 95-101,
- Nuzzo, V. A., "Current and Historic Distribution of Garlic Mustard (*Alliaria petiolata*) in Illinois, report prepared for the Illinois Department of Conservation, Springfield, IL, July 1991.
- 77. Randall, J., Invasive Weed Specialist, Consumnes River Preserve, The Nature Conservancy, Gait, CA, letter to P.N. Windle, Office of Technology Assessment, July 23, 1992.
- 78. Regelbrugge, C. J., Director of Regulatory Affairs and Grower Services, American Association of Nurserymen, Washington DC, letter to

- P.N. Windle, Office of Technology Assessment, Aug. 10, 1992.
- 79. Rosenberry, B., "Shrimp Farming in the United States," *Aquiculture Digest*, February 1988.
- 80. Sailer, R. I., "History of Insect Introductions," Exotic Plant Pests and North American Agriculture, C. Wilson and C.L. Graham (eds.) (New York, NY: Academic Press, 1983), pp. 15-38.
- 81. Schafland, P. L., "A Proposal for Introducing Peacock Bass (*Cichlaspp.*) in Southeast Florida Canals," Contribution No. 40, Non-Native Fish Research Laboratory, Florida Game and Fresh Water Fish Commission, Boca Raton, FL, 1984.
- 82. Schoulties, C. L., "Pathways and Consequences of the Introduction of Non-Indigenous Plant Pathogens in the United States," contractor report prepared for the Office of Technology Assessment, December 1991.
- 83. Schmitz, D. C., Biological Scientist III, Permitting Section, Florida Department of Natural Resources, Tallahassee, FL, memorandum to Rob Kipker, June 28, 1990.
- 84. Schwegman, J. E., "Newsletter of the Illinois Native Plant Conservation Program Division of Natural Heritage, Illinois Department of Conservation," *Illinoisensis*, vol. 7, No. 2, July 1991.
- 85. Schwegman, J. E., Plant Conservation Manager, Illinois Department of Conservation, Springfield, IL, letter to P.T. Jenkins, Office of Technology Assessment, Apr. 6, 1992.
- 86. Seed World, "Wildlife Market on the Rise," Seed *World*, November 1991, p. 26.
- 87. Sharp Bros. Seed Co., "Buffalo Brand: Select Native Grasses" (seed catalog), Healy, KS, 1989.
- 88. Shelton, A.M. and Wyman, J. A., "Insecticide Resistance of Diamondback Moth in North America," *Journal of Economic Entomology*, vol. 79, No. 1, 1986, pp. 11-19.
- Shelton, W.L. and Smitherman, R. O., "Exotic Fishes in Warmwater Aquiculture," *Distribu*tion, Biology, and Management of Exotic Fishes, W.R. Courtenay and J.R. Stauffer (eds.) (Baltimore, MD: The Johns Hopkins University Press, 1984), pp. 262-301.
- 90. Shotts, E. B., Jr. and Gratzek, J. B., "Bacteria, Parasites, and Viruses of Aquarium Fish and Their Shipping Waters," *Distribution, Biology*,

- and Management of Exotic Fishes, W.R. Courtenay, Jr. and J.R. Stauffer, Jr. (eds.) (Baltimore, MD: Johns Hopkins University Press, 1984), pp. 215-232.
- 91. Siddiqui, I. A., Assistant Director, California Department of Food and Agriculture, Sacramento, CA, testimony at hearings before the Senate Committee on Governmental Affairs, Subcomitteee on Federal Services, Post Offices, and Civil Services, Postal Implementation of the Agricultural Quarantine Enforcement Act, June 5, 1991.
- 92. Sugg, I. C., "To Save an Endangered Species, Own One," *The Wall Street Journal*, Aug. 31, 1992, p. A1O.
- 93. Taylor, D. W., "An Eastern American Freshwater Mussel, *Anodonta*, Introduced into Arizona, *The Veliger*, vol. 8, No. 3, 1966, pp. 197-198.
- 94. Teer, J. G., "Non-Native Large Ungulates in North America," *Wildlife Production: Conservation and Sustainable Development*, L.A. Renecker and R.J. Hudson (eds.) (Fairbanks, AK: Agricultural and Forestry Experiment Station, 1991), pp. 55-66.
- 95. Temple, S.A. and Carroll, D. M., "Pathways and Consequences of the Introduction of Non-Indigenous Vertebrates in the United States," contractor report prepared for the Office of Technology Assessment, October 1991.
- 96. Torchio, P.F. et al., "Introduction of the European Bee, *Osmia cornuta*, into California Almond Orchards (Hymenopteran: Megachilidae), " *Environmental Entomology*, vol. 16, No. 3, June 1987, pp. 664-667,
- 97. Turbak, G., "A Pleasant Bird is the Pheasant," *National Wildlife*, vol. 30, October/November, 1992, pp. 14-20.
- 98. Tyser, R.W. and Worley, C. A., "Alien Flora in Grasslands Adjacent to Road and Trail Corridors in Glacier National Park, Montana (U. S. A.)," *Conservation Biology*, vol. 6, No. 2, June 1992, pp. 253-262.
- U.S. Aquatic Nuisance Species Task Force, "proposedAquatic Nuisance Species Program," draft report to the U.S. Congress, Sept. 28,1992.
- 100. U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station, Radnor, PA, "Gypsy Moth Research and Develop-

- ment Program' (Washington, DC: U.S. Government Printing Office, October 1990).
- 101, U.S. Department of Agriculture, Forest Service, "Pest Risk Assessment of the Importation of Larch from Siberia and the Soviet Far East," Miscellaneous Publication No. 1495, September 1991.
- U.S. Department of the Interior, Fish and Wildlife Service, Restoring Americans Wildlife (Washington, DC: U.S. Government Printing Office, 1987).
- 103, U.S. District Court, District of Columbia, 'Memorandum Opinion in *Pennington Enterprises*, *Inc. v. United States*," Civil Action No. 90-1067, filed Mar. 31, 1992.
- 104. U.S. Federal Coordinating Council on Science, Engineering, and Technology, Joint Subcommittee on Aquiculture, "National Aquiculture Development Plan: Volume II, "Washington, DC, September 1983.
- 105. Westbrooks, R. G., "Interstate Sale of Aquatic Federal Noxious Weeds as Ornamental in the United States," *Aquatics*, vol. 2, No. 3, June 1990, pp. 16-24.
- 106. Westbrooks, R. G., U.S. Department of Agriculture, Animal and Plant Health Inspection Service, "Federal Noxious Weed Inspection Guide: Noxious Weed Inspection System," September 1991, pp. 3.5.1-4.1.5.
- 107. Whitson, T.D. et al., *Weeds of the West* (Jackson, WY: Pioneer of Jackson Hole, January 1991).
- 108. Wildlife Nurseries, Inc., "What Brings Them In' (catalogue of animals and plants for wildlife habitat) (Oshkosh, WI: 1989).
- 109. Wildseed Farms, "Wildflowers: 1992 Seed Catalogue" (Eagle Lake, TX: 1992).
- 110. Williams, J., Project Leader, National Fisheries Research Center, Fish and Wildlife Service, U.S. Department of the Interior, personal communication to E.A. Chornesky, Office of Technology Assessment, Apr. 16, 1993.
- 111. Williams, M. C., "Purposefully Introduced Plants that Have Become Noxious or Poisonous Weeds," Weed Science, vol. 28, No. 3, May 1980, pp. 300-305.
- 112. Yee, R. S. N., personal communication to R.N. Mack, as cited in Mack, R. N., 1991 (#63).

113. Zamora, D.L. et al., "An Eradication Plan for Plant Invasions," *Weed Technology*, vol. *3, No.* 1, January/March 1989, pp. 2-12.

CHAPTER 4: THE APPLICATION OF DECISIONMAKING METHODS

- Associated Press, 'Forest Bugaboo-Alarm Over Discovery of Asian Gypsy Moths," Seattle Times/Post Intelligence, Nov. 24, 1991, p. B-8.
- Blockstein, D., Executive Director, Committee for the National Institute for the Environment, Washington, DC, "Sample Guidelines for Consideration of Biological Diversity in Environmental Impact Statements," draft unpublished memorandum, 1989.
- *3,* Bullis, C.A. and Kennedy, J. J., "Values Conflicts and Policy Interpretation," *Policies Studies Journal*, vol. 19, No. 3-4, 1991, pp. 542-552.
- **4.** Bullock, G., "A Love Affair with Exotic Plants," *Bulletin of the Pacific Tropical Botanical Garden*, vol. 18, No. 2-3, April/July, 1988, pp. 58-9,
- Carlton, J. T., 'Man's Role in Changing the Face of the Ocean, 'Conservation Biology, vol. 3, No. 3, 1989, pp. 270-272.
- 6. Carter, P. C. S., "Risk Assessment and Pest Detection Surveys for Exotic Pests and Diseases which Threaten Commercial Forestry in New Zealand," New Zealand Journal of Forestry Science, vol. 19, Nos. 2/3, 1989, pp. 353-374.
- Clark, A., Program Supervisor, Pest Exclusion Branch, California Department of Agriculture, Sacramento, CA, personal communication to P.T. Jenkins, Office of Technology Assessment, Feb. 14, 1991.
- 8. Coates, J. F., "Factors Shaping and Shaped by the Environment: 1990-2010," Futures Research Quarterly, vol. 7, No. 3, 1991, pp. 5-55.
- Cochran, M., "Non-Indigenous Species in the United States: Economic Consequences," contractor report prepared for the Office of Technology Assessment, March 1992.
- Coulson, J.R. and Soper, R. S., "Protocols for the Introduction of Biological Control Agents in the U.S.," *Plant Protection and Quarantine—Vol. III*, R.P. Kahn (cd.) (Boca Raton, FL: CRC Press, 1989), pp. 1-35.

- 11. Courtenay, W. R., "Pathways and Consequences of Introductions of Non-Indigenous Fishes in the United States," contractor report prepared for the Office of Technology Assessment, August 1991.
- Crawley, M. J., "What Makes A Community Invisible?' Colonization, Succession and Stability, A.J. Gray et al. (eds.) (Oxford, England: Blackwell Scientific Publ., 1987), pp. 429453.
- 13. Cropper, M.L. and Oates, W. E., 'Environmental Economics: A Survey," *Journal of Economic Literature*, vol. 30, June 1992, pp. 675-740.
- 14. DeFazio, P., Member of U.S. House of Representatives et al., letter to Clayton K. Yeutter, Secretary, U.S. Department of Agriculture, Dec. 5, 1990.
- Drost, C.A. and Fellers, G. M., National Park Service, U.S. Department of the Interior, Washington, DC, "Draft Handbook for the Removal of Non-Native Animals," 1992.
- Edelson, D., Staff Attorney, Natural Resources Defense Council, San Francisco, CA, personal communication to P.T. Jenkins, Office of Technology Assessment, Feb. 5, 1991.
- 17. Edwards, G. B., Assistant Director, Fisheries Division, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC, testimony at hearings before the House Committee on Merchant Marine and Fisheries, Subcommittee on Oversight and Investigations, July 12, 1991, Serial No. 102-28, pp. 32-33.
- 18. Environmental Law Institute, *Law of Environmental Protection—Vol. I (New* York, NY: Clark Boardman Co., 1990), p. 6-24.
- 19. Gleick, J., Chaos. Making a New Science (New York, NY: Viking Press, 1987).
- 20. Gregory, R., "A Decision Framework for Managing the Risks of Deliberate Releases of Genetic Materials," *Dispersal of Living Organisms into Aquatic Ecosystems*, A. Rosenfeld and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 421-434.
- 21. Gregory, R. et al., "Adapting the Environmental Impact Statement Process to Inform Decision Makers," *Journal of Policy Analysis and Management*, vol. 11, No. 1, 1992, pp. 58-75.
- 22. Harding, M., Arizona Department of Game and Fish, Phoenix, AZ, 'Public Interest in Conserva-

- tion: Perceptions of Native Fishes in Arizona—A Report to the Nongame Branch of the Arizona Department of Game and Fish," June 1991.
- 23. Hiebert, R. D., Chief Scientist, National Park Service-Midwest Region, U.S. Department of the Interior, Omaha, NE, personal communication to P.T. Jenkins, Office of Technology Assessment, Sept. 27, 1991.
- 24. Kahn, R. P., "Quarantine Significance: Biological Considerations," *Plant Protection and Quarantine—Vol. I*, R.P. Kahn (cd.) (Boca Raton, FL: CRC Press, 1989), pp. 201-216.
- 25. Kahn, R. P., Consultant, **Rockville**, MD, letter to **P.N. Windle**, Office of Technology Assessment, Dec. 2, 1991.
- 26. Kareiva, P., Groom, M., Parker, I., and Ruesink, J., "Risk Analysis as Tool for Making Decisions about the Introduction of Non-Indigenous Species into the United States," contractor report prepared for the Office of Technology Assessment, July 1991.
- 27. Kareiva, P., Professor, Department of Zoology, University of Washington, contract paper prepared for OTA Workshop on Management and Policy Decisionmaking for Non-Indigenous Species in the United States, Washington, DC, Nov. 13-14, 1991.
- 28. Kellert, S. R., Knowledge, Affection and Basic Attitudes toward Animals in American Society (Washington, DC: U.S. Government Printing Office, 1980).
- 29. Kellert, S.R. and Clark, T.W., "The Theory and Application of a Wildlife Policy Framework" *Public Policy Issues in Wildlife Management*, W.R. Mangun (cd.) (New York, NY: Greenwood Press, 1991), pp. 17-38.
- 30. Klingman, D.L. and Coulson, J. R., "Guidelines for Introducing Foreign Organisms into the United States for the Biological Control of Weeds," *Bulletin of the Entomological Society of America*, vol. 19, No. 3, 1983, pp. 55-61.
- 31. Kohler, C. C., "Toward a Reasoned Approach to Introduced Aquatic Organisms," *Dispersal of Living Organisms into Aquatic Ecosystems*, A. Rosenfeld and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 393-404.
- 32. Kuchler, F. and **Duffy**, M., U.S. Department of Agriculture, Economic Research Service, "Con-

- trol of Exotic Pests-Forecasting Economic Impacts, " Agricultural Economic Report No. 518, 1984.
- 33. Kurdila, J., "The Introduction of Exotic Species into the United States: There Goes the Neighborhood!" Boston College Environmental Affairs Law Review, vol. 16, No, 1, 1988, pp. 95-118.
- 34. Lassuy, D., Fish and Wildlife Biologist, Fisheries Division, Fish and Wildlife Service, U.S. Department of the Interior, Arlington, VA, personal communication to E.A. Chornesky, Office of Technology Assessment, Apr. 7, 1993.
- 35. Lattin, J. D., Professor of Entomology, Oregon State University, memorandum to Bill Wright, Administrator, Plant Division, Oregon Department of Agriculture, Salem, OR, Nov. 1, 1990.
- 36. Lattin, J, D., Professor of Entomology, Oregon State University, Corvallis, OR, personal communication to P.T. Jenkins, Office of Technology Assessment, Jan. 31, 1991.
- 37. Lattin, J. D., Professor of Entomology, Oregon State University, Corvallis, OR, letter to Kathleen Johnson, Oregon Department of Agriculture, Feb. 20, 1991.
- 38. Lawton, J. H., "Annual Report: 1 April 1990-31 March 1991,' Center for Population Biology, Imperial College at Silwood Park, Berkshire, England, June 14, 1991.
- 39. Levin, S. A., "Analysis of Risk for Invasions and Control Programs, " Biological Invasions: a Global Perspective, J.A. Drake et al. (eds.) (New York, NY: Wiley & Sons, 1989), pp. 425435.
- 40. Mack, R. N., "Pathways and Consequences of Introductions of Non-Indigenous Plants in the United States," contractor report prepared for the Office of Technology Assessment, September 1991.
- 41. Mack, R. N., "Pathways and Consequences of Introductions of Non-Indigenous Plants in the United States-Additional Information,' supplemental contractor report prepared for the Office of Technology Assessment, October 1992.
- 42. Maguire, L. A., Professor, School of Forestry and Environmental Studies, Duke University, presentation at OTA Workshop on Management and Policy Decisionmaking for Non-Indigenous Species in the United States, Washington, DC, Nov. 13-14, 1991.

- 43. Maguire, L.A. and Servheen, C., "Integrating Biological and Sociological Concerns in Endangered Species Management: Augmentation of Grizzly Bear Populations,' Conservation Biology, vol. 6, No. 3, September 1992, pp. 426-432.
- 44. Mann, R., "Exotic Species in Aquaculture: An Overview of When, Why and How," Proceedings of a Symposium on Exotic Species in Mariculture, Woods Hole, MA, Sept. 18-20, 1978, pp. 331-53.
- 45. McCrea, E.J. and Shotkin, A., "Public Educational Efforts in the United States Regarding Prevention and Management of Non-Indigenous Species,' contractor report prepared for the Office of Technology Assessment, December
- 46. Minnesota Interagency Exotic Species Task Force, St. Paul, MN, 'Report and Recommendations,' submitted to the Natural Resources Committees of the Minnesota House and Senate, July 1991.
- 47. Moody, M.E. and Mack, R. N., "Controlling the Spread of Plant Invasions: the Importance of Nascent Foci," Journal of Applied Ecology, vol. 25, 1988, pp. 1009-1021.
- 48. Mooney, H.A. and Drake, J. A., "The Release of Genetically Designed Organisms in the Environment: Lessons from the Study of Ecology of Invasions,' Introduction of Genetically Modified Organisms into the Environment, H.A. Mooney and G. Bernardi (eds.) (New York, NY: Wiley and Sons, 1990), pp. 117-129.
- 49, Morris, R., Division Resources Manager, Louisiana-Pacific Corp., Samoa, CA, internal memorandum to Bill Phillips, Dec. 19, 1990.
- 50. Nature Conservancy of Hawaii, Honolulu, HI, and the Natural Resources Defense Council, Honolulu, HI, "The Alien Pest Species Invasions in Hawaii: Background Study and Recommendations for Interagency Planning, " July 1992.
- 51. Noble, R., Professor, Fisheries and Wildlife Sciences, North Carolina State University, Raleigh, NC, personal communication to P.N. Windle, Office of Technology Assessment, May 31, 1991.
- 52. Norgaard, R.B. and Howarth, R.B., "The Rights of Future Generations and the Role of Benefit-

- Cost Analysis in the Policy Process," paper presented at the Annual Meeting of the Association for Public Policy Analysis and Management, San Francisco, CA, October 1990.
- 53. Orr, R. L., Entomologist, and Cohen, S. D., Plant Pathologist, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, "Generic Pest Risk Assessment Process-For Estimating the Pest Risk Associated with Importation of Foreign Plants and Plant Products (Draft)," Nov. 20, 1991.
- 54. Peoples, R.A. et al., "Introduced Organisms: Policies and Activities of the U.S. Fish and Wildlife Service," *Dispersal of Living Organisms into Aquatic Ecosystems*, A. Rosenfeld and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 325-352.
- Randall, A., Professor of Economics, Ohio State University, Columbus, OH, letter to P.T.Jenkins, Office of Technology Assessment, Sept. 28, 1992.
- Randall, A. and Thomas, M., "The Role and Limits of Economics in Decisionmaking Regarding Non-Indigenous Species," contractor report prepared for the Office of Technology Assessment, August 1991.
- 57. Royer, M. H., "Global Pest Information Systems-Can We Make Them Work?" *Plant Protection and Quarantine-Vol. III*, R.P. Kahn (cd.) (Boca Raton, FL: CRC Press, 1989), pp. 37-57.
- 58. Sagoff, M., "Some Problems with Environmental Economics," *Environmental Ethics, vol.* 10, spring, 1988, pp. 55-74.
- Sagoff, M., "On Making Nature Safe for Biotechnology," Assessing Ecological Risks of Biotechnology, L. Ginsburg (cd.) (Boston, MA: Butterworth, 1991), pp. 341-365.
- 60. **Schaffer**, W. M., "Order and Chaos in Ecological Systems," *Ecology*, vol. 66, *No.* 1, 1985, pp. 93-106.
- 61. Schuyler, P. T., "Selected Analysis of Introduced Animal Species Survey Data," contractor report prepared for the Office of Technology Assessment, December 1991.
- Scribner, J. D., Attorney, Sacramento, CA, letter to P.N. Windle, Office of Technology Assessment, Feb. 3, 1992,

- 63. **Scribner,** J. D., Attorney, Sacramento, CA, personal communication to Office of Technology Assessment, July 30, 1992.
- 64. Shannon, M., Chief Operating Officer for Planning and Design, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville, MD, personal communication to P.T. Jenkins, Office of Technology Assessment, Feb. 5, 1991.
- 65. Shannon, M., Assistant Director for Planning and Design, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville, MD, personal communication to P.T. Jenkins, Office of Technology Assessment, Nov. 13, 1991.
- 66, Shannon, M., Assistant Director for Planning and Design, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville, MD, personal communication to P.T. Jenkins, Office of Technology Assessment, Mar. 2, 1992.
- 67. Shelton, W.L., "Strategies for Reducing Risks from Introductions of Aquatic Organisms: An Aquiculture Perspective," *Fisheries*, vol. 11, No. 2, 1986, pp. 16-18.
- 68. Starfield, A.M. and Herr, A. M., "A Response to Maguire," letter to the editors, *Conservation Biology*, vol. 5, No. 4, 1991, p. 435.
- 69, Stone, C. P., "Humane Natural Area Management in Hawai'i," *The George Wright Forum*, vol. **9**, *No.* 1, 1992, pp. 32-35.
- 70. Suter, G., "Exotic Organisms," *Ecological Risk Assessment*, G.W. Suter II (cd.) (Boca Raton, FL: Lewis Publishers, 1993), pp. 391401.
- 71, Suter, G. and Barnthouse, L., "Assessment Concepts," *Ecological Risk Assessment*, G.W. Suter II (cd.) (Boca Raton, FL: Lewis Publishers, 1993), pp. 21-47.
- Tiedje, J.M. et al., "The Planned Introduction of Genetically Engineered Organisms: Ecological Considerations and Recommendations," *Ecology*, vol. 70, No. 2, 1989, pp. 298-315.
- 73. Towns, D.R. et al., "Protocols for Translocation of Organisms to Islands," Ecological Restoration of New Zealand Islands, D.R. Towns et al. (eds.) (Wellington, New Zealand: Department of Conservation, 1990).

- U.S. Aquatic Nuisance Species Task Force, Intentional Introductions Policy Committee, 'Options Paper—Intentional Introductions Policy Review," May 1992.
- U.S. Aquatic Nuisance Species Task Force, "Proposed Aquatic Nuisance Species Program," Sept. 28, 1992.
- 76. U.S. Congress, House Committee on Merchant Marine and Fisheries, Subcommittee on Fisheries and Wildlife Conservation and the Environment, Hearing on Proposed Injurious Wildlife Regulations, Dec. 12, 1974.
- U.S. Congress, House Committee on Merchant Marine and Fisheries, Subcommittee on Oversight and Investigations, *Hearings on the Intro*duction of Non-Indigenous Species into Existing Ecosystems, Serial No. 102-28, July 12, 1991.
- 78. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Washington, DC, press release entitled "USDA Places Temporary Prohibition on Entry of Siberian Logs Because of Pests," Dec. 20, 1990.
- U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Washington, DC, "An Efficacy Review of Control Measures for Potential Pests of Imported Soviet Timber,' Miscellaneous Publication No. 1496, September 1991.
- 80. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, "Review of OTA'S Draft Document: Non-Indigenous Species in the United States," July 30, 1992.
- 81. U.S. Department of Agriculture, Forest Service, "Pest Risk Assessment of the Importation of Larch from Siberia and the Soviet Far East," Miscellaneous Publication No. 1495, September 1991.
- 82. U.S. Department of Interior, Bureau of Sports Fisheries and Wildlife, "Draft Environmental Statement on Proposed Importation Regulations-Injurious Wildlife," DES 74-64, 1974.
- 83. U.S. Department of the Interior, Fish and Wildlife Service, Washington, DC, "Policies for Reducing Risks Associated with Introductions of Aquatic Organisms," executive summary of discussion paper, Oct. 14, 1987.
- 84. Welcomme, R. L., "International Measures for the Control of Introduction of Aquatic Orga-

- nisms, ' Fisheries, vol. II, No. 2, April-May 1986, pp. 4-9.
- 85. Whiteaker, L.D. and Doren, R. F., Southeast Regional Office, National Park Service, U.S. Department of the Interior, "Exotic Plant Species Management Strategies and List of Exotic Species in prioritized Categories for Everglades National Park," Research/Resources Management Report SER-89/04, 1989,
- 86. Wood, D. L., Professor of Entomology, and Cobb, F. W., Jr., Professor of Plant Pathology, Univ. of California, Berkeley, letter to Dean Cromwell, California State Board of Forestry et al., Sacramento, CA, Dec. 11, 1990.
- 87, Yang, X.B. et al., "Assessing the Risk and Potential Impact of an Exotic Plant Disease," *Plant Disease*, vol. 75, No. 10, 1991, pp. 976-82.

CHAPTER 5: TECHNOLOGIES FOR PREVENTING AND MANAGING PROBLEMS

- Anonymous, "Insect Aside: Beware of the Fire Down Below. Stinging Ants From Farther South Have Begun to Make Inroads in Virginia, Maryland," Washington Post, June 2, 1992, pp. B3.
- 2. Anonymous, 'Entomology: Destructive Fly May Be New Species," *Washington Post*, Jan. 4, 1993, pp. A2.
- 3. Anonymous, "Science Update," *Agricultural Research*, February 1993.
- Aspelin, A. L., Grube, A. H., and Kibler, V., Environmental Protection Agency, Office of Pesticide Programs, "Pesticide Industry Sales and Usage: 1989 Market Estimates,' Washington, DC, July 1991.
- Berger, J.L. and Riggs, L. A., "Ecological Restoration and Non-Indigenous Species," contractor report prepared for the Office of Technology Assessment, August 1991.
- 6. Butler, L., "Non-target Impact of Din-din and *Bacillus thuringiensis*," *Gypsy Moth News*, February 1992, pp. 4-5.
- California Department of Food and Agriculture, Division of Plant Industry, "1990 Annual Report," Sacramento, CA, 1990.
- 8. California Department of Food and Agriculture, Divison of Plant Industry, Pest Exclusion, 'Cali-

- fornia Plant Pest Distribution Report," vol. 9, 1990, pp. 63-66.
- Carey, J. R., "The Mediterranean Fruit Fly in California: Taking Stock," *California Agricul-ture*, Jan. -Feb. 1992, pp. 12-17,
- Charudattan, R. et al., Special Problems Associated with Aquatic Weed Control, "New Directions in Biological Control: Alternatives for Suppressing Agricultural Pests and Diseases, R.R. Baker and P.E. Dunn (eds.) (New York, NY: Alan R. Liss, Inc., 1990).
- Council for Agricultural Science and Technology (CAST), Pests of Plant and Animals: Their Introduction and Spread, report No.112, Ames, IA, March 1987.
- Courtenay, W. R., "Pathways and Consequences of the Introduction of Non-Indigenous Fishes in the United States," contractor report prepared for the Office of Technology Assessment, August 1991.
- Cowley, J. M., "A New System of Fruit Fly Surveillance Trapping in New Zealand," New Zealand Entomologist, vol. 13, 1990, pp. 81-84.
- Crooks, E. et al., "Stopping Pest Introductions," Exotic Plant Pests and North American Agricul- ture, C.I. Wilson and C.L. Graham (eds.) (Lon- don, U. K.: Academic Press, Inc., 1983), pp. 239-259.
- 15. Crozier, Y.C., Koulianos, S., and Crozier, R. H., "An Improved Test for Africanized Honeybee Mitochondrial DNA," *Experiential*, vol. 47, 1991, pp. 968-969.
- DeBach, P. and Rosen, D., *Biological Control by Natural Enemies* (Cambridge, U. K.: Cambridge University Press, 1991).
- Delfosse, E. S., Director, National Biological Control Institute, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, letter to P.N. Windle, Office of Technology Assessment, Aug. 31, 1992,
- 18. **DeLoach**, C.J., "Past Successes and Current Prospects in Biological Control of Weeds in the United States and Canada," *Natural Areas Journal*, vol. 11, No. 3, 1991, pp. 129-142.
- 19. Drost, C.A. and Fellers, G. M., "Handbook for the Removal of Non-native Animals," draft, 1992.

- 20. Ehler, L.E., "Revitalizing Biological Control," *Issues in Science and Technology*, vol. 7, No. 1, fall 1990, pp. 91-%.
- 21. Ehler, L.E. and Endicott, P. C., "Effect of Malathion-Bait Sprays on Biological Control of Insect Pests of Olive, Citrus, and Walnut, " *Hilgardia*, vol. 52, No. 5, 1984, pp. 1-47.
- Ehler, L.E. et al., "Medfly Eradication in California: Impact of Malathion-Bait Sprays on an Endemic Gall Midge and Its Parasitoids," Entomological Experiments and Applications, vol. 36, 1984, pp. 201-208.
- 23. Ehrenfeld, D., "Conservation and the Rights of Animals," *conservation Biology*, vol. 5, No. 1, March 1991, pp. 1-3.
- 24. Fagerstone, K. A., Bullard, R. W., and Ramey, C. A., "Politics and Economics of Maintaining Pesticide Registrations," *Proceedings of the* 14th. Vertebrate Pest Conference, L.R. Davis and R.E. Marsh (eds.) (Davis, CA: University of California at Davis, 1990).
- Fritts, T.H., Scott, N.J., Jr., and Smith, B. E., "Trapping *Boiga irregulars* on Guam Using Bird Odors," *Journal of Herpetology, vol. 23*, No. 2, 1989, pp. 189-192.
- 26. Gallagher, J.E. and Hailer, W.T., "History and Development of Aquatic Weed Control in the United States," *Review of Weed Science*, vol. 5, 1990, pp. 115-192.
- 27. **Geist**, V., "Endangered Species and the Law," *Nature*, vol. 357, May 28, 1992, pp. 274-276.
- Greathead, D.J. and Greathead, A. H., "Biological Control of Insect Pests by Parasitoids and Predators: the BIOCAT Database," *Biocontrol News and Information*, vol. 13, No. 4, 1992, pp. 61 N-68N.
- 29. Hansen, **J.D.** et al., "Efficacy of Hydrogen Cyanide Fumigation as a Treatment for Pests of Hawaiian Cut Flowers and Foliage after Harvest," *Journal of Economic Entomology, vol.* 84, No. 2, 1991, pp. 532-536.
- Harris, P., "Environmental Impacts of Weed-Control Insects. Weed Stands have been Replaced by Diverse Plant Cornrunities," *BioScience*, vol. 38, No. 8, September 1988, pp. 542-548.
- 31. Hester, F. E., "The U.S. National Park Service Experience with Exotic Species," *National Areas*

- Journal, vol. 11, No. 3, 1991, pp. 127-128.
- 32. Holt, M. and Radzanowski, D., Library of Congress, Congressional Research Service, "Memorandum on Potential Environmental Characteristics and Monitoring Technologies Currently Used by Federal Agencies," Dec. 5, 1991.
- 33. Hopper B.E. and Campbell, W. P., "Crop Protection Information Needs: A NAPPO Perspective," Crop Protection Information: An International Perspective, Proceedings of the International Crop Protection Information Workshop, 1989, K.M Harris and P.R. Scott (eds.) (Wallingford, Oxon, U. K.: CAB International, 1989), pp. 225-233.
- 34. Howarth, F. G., "Environmental Impacts of Classical Biological Control," *Annual Review of Entomology*, vol. 36, 1991, pp. 485-509.
- 35. Jennings, P. and McCann, J, A., U.S. Fish and Wildlife Service, National Fisheries Research Center, "Research Protocol for Handling Non-Indigenous Aquatic Species," Gainesville, FL, April 1991.
- 36. Joslin, P., "The Genetic Test that Can Recognize Wolves, Dogs, and Hybrids from Each Other," Wolftracks (newsletter by Wolf Haven International, Tenino, WA), vol. 8, No. 4, 1991, p. 6.
- 37. Jutsum, A, R., "Commercial Application of Biological Control: Status and Prospects," Phil. Trans. R. Soc. Lond. B, vol. 318, Biological Control of Pests, Pathogens and Weeds: Development and Prospects, R.K. S. Wood, F. R, S., and M.J. Way (eds.) 1988, pp. 357-376.
- 38. Kahn, R. P., "Exclusion as a Plant Disease Control Strategy," *Annual Review of Phytopa-thology*, vol. 29, 1991, pp. 219-246.
- 39. Kareiva, P. et al., "Risk Analysis as a Tool for Making Decisions about the Introduction of Non-Indigenous Species into the United States," contractor report prepared for the Office of Technology Assessment, July 1991.
- Kim, K.C. and Wheeler, A. G., Jr., "Pathways and Consequences of the Introduction of Non-Indigenous Insects and Arachnids in the United State s,' contractor report prepared for the Office of Technology Assessment, December 1991.
- Kirkpatrick, J. F., "Wildlife Contraception. A New Way of Looking at Wildlife Management,"

- Humane Society of the United States News, fall, 1991, pp. 22-25.
- 42. Klassen, W., "Eradication of Introduced Arthropod Pests: Theory and Historical Practice," Entomological Society of America, Miscellaneous Publications, No. 73, November 1989.
- 43. Kludy, D. H., 'Federal Policy on Non-Indigenous Species: The Role of USDA's Animal and Plant Health Inspection Service, 'contractor report prepared for the Office of Technology Assessment, December 1991.
- LaMadeleine, L. A., U.S. Department of Agriculture, Forest Service, "Non-Indigenous Species in the United States-Gypsy Moth Eradication-Utah," Ogden, UT, May 13, 1991.
- 45, Lambert, B. and Peferoen, M., "Insecticidal Promise of *Bacillus thuringiensis*," *Bioscience*, vol. 42, No. 2, February 1992, pp. 112-122.
- 46. Lanier, G. N., 'Principles of Attraction-Annihilation: Mass Trapping and Other Means,' Behavior- modifying Chemicals for Insect Management: Applications of Pheromones and Other Attractants, R.L. Ridgway, R.M. Silverstein, R.M. Inscoe (eds.) (New York, NY: Marcel Dekker, Inc., 1990), pp. 25-45.
- 47. Lanka, B. et al., Game Division, Wyoming Game and Fish Department, Cheyenne, WY, 'Analysis and Recommendations on the Applications by Mr. John T. Dorrance III to Import and Possess Native and Exotic Species,' Mar. 1, 1990.
- 48. Lindsey G. and Novak, K., "Developments in Information Dissemination Techniques: Directions for International Agricultural Research Centers,' Crop Protection Information: and International Perspective: Proceedings of the International Crop Protection Information Workshop, 1989, K.M. Harris and P.R. Scott (eds.) (Wallingford, U. K.: CAB International, 1989), pp. 27-48.
- Mack, R. N., "Pathways and Consequences of Non-Indigenous Plants in the United States," contractor report prepared for the Office of Technology Assessment, September 1991.
- 50. Mallet, J. and Porter, P., "Preventing Insect Adaptation to Insect-Resistant Crops: Are Seed Mixtures or Refugia the Best Strategy?" Proceed-

- ings of the Royal Society of London, Series B, vol. 250B, 1992, pp. 165-169.
- 51. Mastro, V. C., Schwalbe, C. P., and O'Dell, TM., "Sterile-Male Technique," The Gypsy Moth: Research Toward Integrated Pest Management, C.C. Deane and M.L. McManus (eds.) (Washington, DC: U.S. Department of Agriculture, 1981), pp. 669-679.
- 52. Mathys, G. and Baker, E. A., "An Appraisal of the Effectiveness of Quarantine," Annual Review of Phytopathology, vol. 18, 1980, pp. 85-101.
- 53. McGaughey, W.H. and Whalen, M. E., "Managing Insect Resistance to Bacillus thuringiensis Toxins," Science, vol. 258, Nov. 27, 1992, pp. 1451-1455.
- 54. McGregor, R. C., "TheEmigrantPests," areport to Dr. F.J. Mulhern, Administrator, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Washington, DC, May 1974.
- 55. McMahon, R.F. and Tsou, J, L., "Impact of European Zebra Mussel Infestation to the Electric Power Industry," paper presented at the Annual Meeting of the American Power Conference, Chicago, IL, Apr. 23-25, 1990, pp. 1-9.
- 56. Meehan, B. W., Carlton, J.T., and Wenne, R., "Genetic Affinities of the Bivalve Macoma balthica from the Pacific Coast of North America: Evidence for Recent Introduction and Historical Distribution, 'Marine Biology, vol. 102, 1989, pp. 235-241.
- 57. Meeusen, R.L. and Warren, G., "Insect Control with Genetically Engineered Crops, ' Annual Review of Entomology, vol. 34, 1989, pp. 373-
- 58. Melching, J. S., Bromfield, K. R., and Kingsolver, C. H., 'The Plant Pathogen Containment Facility at Frederick, Maryland,' Plant Disease, vol. 67, No. 7, July 1983, pp. 717-722.
- 59. Meyers, J. H., Higgins, C., and Kovacs, E., "How Many Insect Species are Necessary for the Biological Control of Insects?" Environmental Entomology, vol. 18, No. 4, 1989, pp. 541-547.
- 60. Micales, J. A., "The Use of Isozyme Analysis in Fungal Taxonomy and Genetics," Mycotaxon, vol. 27, October-December 1986, pp. 405449.

- 61. Mills, N.J., "Biological Control, A Century of Pest Management," Bulletin of Entomological Research, vol. 80, 1990, pp. 359-362.
- 62, Minnesota Department of Natural Resources, Exotic Species Programs and Bureau of Information and Education, Exotic Species Handbook (St. Paul, MN: Minnesota Department of Natural Resources, 1992).
- 63. Morrissey, W. A., Library of Congress, Congressional Research Service, "Methyl Bromide and Stratospheric Ozone Depletion: Scientific Basis for Regulation?' Report for Congress, Aug. 14, 1992.
- 64, Murphy, K.J. and Pieterse, A.H., "Present Status and Prospects of Integrated Control of Aquatic Weeds," Aquatic Weeds: The Ecology and Management of Nuisance Aquatic Vegetation, A.H. Pieterse and K.J. Murphy (eds.) (Oxford, UK: Oxford University Press, 1990), pp. 223-227.
- 65. National Research Council, Managing Global Genetic Resources: The U.S. National Plant Germplasm System (Washington, DC: National Academy Press, 1991).
- 66. National Research Council, Restoration of Aquatic Ecosystems: Science, Technology, and Public Policy (Washington, DC: National Academy Press, 1992).
- 67. Peacock, J. et al., "Laboratory and Field Studies on the Effects of Bacillus thuringiensis on Non-target Lepidoptera," Gypsy Moth News, February 1992, pp. 7-8.
- 68. Rosenberg, D. Q., "The Interaction of State and Federal Quarantines in the U.S.," Plant Protection and Quarantine, Volume III Special Topics, R.P. Kahn (cd.) (Boca Raton, FL: CRC Press **Inc.**, 1989), pp. 59-74.
- 69. Roth, H., "Concepts and Recent Developments in Regulatory Treatments, ' Plant Protection and Quarantine, Volume III Special Topics, R.P. Kahn (cd.) (Boca Raton, FL: CRC Press, Inc., 1989), pp. 117-144.
- 70. Sailer, R. I., "Extent of Biological and Cultural Control of Insect Pests of Crops," CRC Handbook of Pest Management in Agriculture, 1st. ed., D. Pimentel (cd.) (Boca Raton, FL: CRC Press, 1981), pp. 57-67.

- Sand, P.F. and Manley, J.D., "The Witchweed Eradication Program Survey, Regulatory and Control," Witchweed Research and Control in the United States, P.F. Sand, R.E. Eplee, and G.W. Westbrooks (eds.) (Champaign, IL: Weed Science Society of America, 1990), pp. 141-150.
- 72. Schoulties, C. L., "Pathways and Consequences of the Introduction of Non-Indigenous Plant Pathogens in the United States," contractor report prepared for the Office of Technology Assessment, December 1991.
- 73. Schuyler, P., ''Feral Animal Control: Santa Cruz Island, California, ' *Natural Areas Journal*, vol. *9, No. 4, 1989*, p. *265*.
- 74. Sheppard, W. S., Steck, G. J., and McPheron, B. A., "Geographic Populations of the Medfly May Be Differentiated by Mitochondrial DNA Variation, *Experimentia*, vol. 48, No. 10, October 1992, pp. 1010-1013.
- Shoemaker, A., Chairman of the Mammal Standards Committee, Riverbank Zoological Park, Columbia, SC, personal communication to S. Fondriest, Office of Technology Assessment, Apr. 7, 1992.
- 76. Shotkin, A. and McCrea, E. J., "Public Educational Efforts in the United States Regarding Prevention and Management of Non-Indigenous Species,' contractor report prepared for the Office of Technology Assessment, December 1991.
- 77. Siddiqui, I. A., Assistant Director, California Department of Food and Agriculture, Sacramento, CA, testimony at hearings before the Senate Committee on Governmental Affairs, Subcommittee on Federal Services, Post Offices, and Civil Services, Postal Implementation of the Agricultural Quarantine Enforcement Act, June 5, 1991.
- 78, Silverstein, R. M., "Practical Use of Pheromones and Other Behavior-modifying Compounds: Overview," *Behavior-Modifying Chemicals for Insect Manage merit.*" *Applications of Pheromones and Other Attractants*, R.L. Ridgway, R.M. Silverstein, and R.M.Inscoe (eds.) (New York, NY: Marcel Dekker, 1990), pp. 1-8.
- 79, Stace-Smith, R. and Martin, R. R., "Plant Quarantine Diagnostic Problems: Viruses, 'Plant Protection and Quarantine Volume II, Selected Pests

- and Pathogens of Quarantine Significance, R.P. Kahn (cd,) (Boca Raton, FL: CRC Press, Inc., 1989), pp. 183-204.
- 80. Stephens, C. H., "Minimizing Pesticide Use in a Vegetative Management System," *HortScience*, vol. 25, No. 2, February 1990, pp. 164-167.
- 81. Stevens, W. K., "Biologists Plan Survey of Ecosystems," *The Sunday Herald*, Monterey Bay, CA, Mar. 14, 1993, p. 8A.
- 82. Temple, S.A. and Carroll, D. M., "Pathways and Consequences of Introductions of Non-Indigenous Vertebrates in the United States," contractor report prepared for the Office of Technology Assessment, October 1991.
- 83. Tisdell, C. A., "Economic Impacts of Biological Control of Weeds and Insects," *Critical Issues in Biological Control*, M. Mackauer, L.E. Ehler, and J. Roland (eds.) (Andover, Hants, UK: Intercept Ltd., 1990), pp. 301-316.
- 84. U.S. Aquatic Nuisance Species Task Force, Proposed Aquatic Nuisance Species Program, Sept. 28, 1992.
- 85. U.S. Congress, General Accounting Office, Geographic Information Systems, Status of Selected Agencies, GAO/IMTEC-90-74FS, August 1990.
- 86. U.S. Congress, General Accounting Office, Great Lakes Fishery Commission: Actions Needed to Support an Expanded Program, March 1992.
- 87. U.S. Congress, General Accounting Office, USDA's Research to Support Reregistration of Pesticides for Minor Crops, June 1992.
- 88. U.S. Congress, House Committee on Appropriations, Hearings on the Department of the Interior and Related Agencies Appropriations for 1993, Serial No. 56-090 (Washington, DC: U.S. Government Printing Office, Apr. 28, 1992), pp. 231-246.
- 89. U.S. Congress, House of Representatives, Committee on Merchant Marine and Fisheries, Great Lakes Sea Lamprey Control Program Hearings, Status of Efforts to Control Sea Lamprey Populations in the Great Lakes (Washington, DC: U.S. Government Printing Office, Sept. 17, 1991).
- U.S. Congress, Office of Technology Assessment, Pest Management Strategies, Vol. I—Summary, October 1979.
- **91.** U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection

- and Quarantine, "Protecting United States Agriculture from Foreign Pests and Diseases, 'August 1985.
- 92. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Management and Budget Administrative Services Division, Hyattsville, MD, "Master Plan for the USDA National Plant Germplasm Quarantine Center," Sept. 11, 1989.
- 93. U.S. Department of Agriculture, Animal and Plant Health Inpection Service, "Administrative Instructions Governing the Entry of Apples and Pears from Certain Countries in Europe,' 7 CFR Ch. III, 319.56-2r,(1-1-91 Edition), 1991.
- 94. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 'Papayas From Hawaii,' 7 CFR Part 318. 56 (156), Tuesday, Aug. 13, 1991.
- 95. U.S. Department of Agriculture, Cooperative State Research Service, "Role of IR-4 in the Registration of Biological Control Agents," Proceedings of the USDA/CSRS National Workshop on Critical Issues in Biological Control, held at the National Wildlife Federation, Vienna, VA, 1991.
- 96. U.S. Department of Agriculture, Office of the Secretary, Office of Agricultural Biotechnology, "Environmental Assessment of Research on Transgenic Carp in Confined Outdoor Ponds," Nov. 15, 1990.
- 97. U.S. Department of Transportation, Coast Guard 33 CFR Part 151, "Ballast Water Management for Vessels Entering the Great Lakes," vol. 57, No. 192, Friday, Oct. 2, 1992.
- Veitch, C.R. and Bell, B. D., "Eradication of Introduced Animals from the Islands of New Zealand," Ecological Restoration of New Zealand Islands, D.R. Towns, C.H. Daugherty, and I. Atkinson (eds.), Conservation Sciences Publication No. 2, Department of Conservation, Wellington, 1990, pp. 137-146.
- Vinson, S. B., "Potential Impact of Microbial Insecticides on Beneficial Arthopods on the Terrestrial Environment," Safety of Microbial Insecticides, M. Laird, L.A. Lacey and E.W. Davidson (eds.)(Boca Raton, FL: CRC Press, 1990), pp. 43-64.

- 100. Wall, C. "Principles of Monitoring," Behavior-modifying Chemicals for Insect Management: Applications of Pheromones and Other Attractants, R.L. Ridgway, R.M. Silverstein, and R.M. Inscoe (eds.) (New York, NY: Marcel Dekker, Inc., 1990), pp. 9-23.
- 101. Wapshere, A. J., **Delfosse**, E. S., and **Cullens**, J. M., "Recent Developments in Biological Control of Weeds," *Crop Protection*, vol. 8., August 1989, pp. 227-250.
- 102. Wilson, E. O., "The Corning Pluralization of Biology and the Stewardship of Systematic," *Bioscience*, vol. *39*, *No. 4*, April 1989, pp. 242-245.
- 103. Witt, I., Policy and Program Development, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, personal communication to E. Chornesky, Office of Technology Assessment, Nov. 9, 1992.
- 104. Womach, J., Library of Congress, Congressional Research Service, "Regulating U.S. Pesticide Exports: Policy Issues and Proposed Legislation," Report to Congress, July 1991.
- 105. Zadig, D., "Plant Quarantines: Domestic Strategies Yield to International Policies," *California Agriculture*, January-February 1992, pp. 9-10.

CHAPTER 6: A PRIMER ON FEDERAL POLICY

- 1. Anonymous, "Preventing Tomorrow's Catastrophes," *Farm Forum*, summer 1990.
- Backiel, A. et al., Library of Congress, Congressional Research Service, "Major Federal Land Management Agencies: Management of Our Nation's Land and Resources," May 7, 1990.
- Bandel, D, M., Chief, Natural and Cultural Resources Division, Directorate of Public Works, Department of the Army, Fort Belvoir, VA, memorandum to the Executive Director, Armed Forces Pest Management Board, Feb. 4, 1992.
- 4. Bean, M.J., "The Role of the U.S. Department of the Interior in Non-Indigenous Species Issues," contractor report prepared for the Office of Technology Assessment, November 1991.
- Beard, J.D., "Bug Detectives Crack the Tough Cases,' Science, vol. 25, Dec. 13, 1991, pp. 1580-1581.
- 6. **Betz**, F. S., Acting Chief, Science Evaluation and Coordination Staff, Environmental Protection

- Agency, Washington, DC, personal communication to E.A. Chornesky, Office of Technology Assessment, January 1992.
- Betz, F.S., Acting Chief, Science Evaluation and Coordination Staff, U.S. Environmental Protection Agency, Washington, DC, letter to E.A. Chornesky, Office of Technology Assessment, Apr. 10, 1992.
- 8. Betz, F. S., Forsyth, S. F., and Stewart, W. E., "Registration Requirements and Safety Considerations for Microbial Pest Control Agents in North America.' Safety of Microbial Peticides, M. Laird et al. (eds.) (Boca Raton, FL: CRC Press, Inc., 1990).
- Bolsenga, S. J., Great Lakes Environmental Research Laboratory, National Oceanic and At mospheric Administration, U.S. Department of Commerce, letter to E.A. Chornesky, Office of Technology Assessment, Apr. 1, 1992.
- Brosten, D., "ITackling Tumbleweeds on CRP Acreage, ' Agrichemical Age, vol. 32, No. 5, May 1988, pp. 12-18.
- 11. Bushman, J., Office of Environmental Policy and Civil Works, Army Corp of Engineers, Washington, DC, personal communication to S.M. Fondriest, Office of Technology Assessment, Feb. 11, 1992.
- Campbell, D. S., Director, Operational Support International Services, Animal Plant Health Inspection Service, letter to P.N. Windle, Office of Technology Assessment, Aug. 11, 1992.
- Carruthers, R.I. and Coulson, J. R., "Ecological Benefits and Risks Associated with the Introduction of Exotic Species for Biological Control of Agricultural Pests, ' paper presented at workshop of National Academy of Science, Committee on Risk Assessment Methodology, Airlie Foundation, Barrington, VA, Feb. 2&Mar. 1, 1991.
- Cauchon, S. P., Coastal Information Specialist, National Ocean Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Washington, DC, letter to E.A. Chornesky, Office of Technology Assessment, June 15, 1992.
- Clay, W., Director, Animal Damage Control, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville,

- MD, personal communication to the Office of Technology Assessment, Mar. 13, 1991.
- Clay, W., Director, Animal Damage Control, Animal and Plant Health Inspection Service, FAX to E.A. Chornesky, Office of Technology Assessment, Oct. 23, 1992.
- 17. Conlin, M., Chief, Fisheries Division, Illinois Department of Conservation, Springfield, IL, letter to R.A. Peoples, Fish and Wildlife Service, U.S. Department of the Interior, Jan. 4, 1993.
- Coulson, J.R. and Soper, R.S., "Protocols for the Introduction of Biological Control Agents in the U.S.*" *Plant Protection and Quarantine: Volume III*, Robert P. Kahn (cd.) (Boca Raton, FL: CRC Press, Inc., 1989), pp. 1-35.
- Council for Agricultural Science and Technology, "Ecological Impacts of Federal Conservation and Cropland Reduction Programs, 'Task Force Report No. 117, September 1990.
- Courtenay, W. R., Jr., 'Pathways and Consequences of the Introduction of Non-Indigenous Fishes in the United States," contractor report prepared for the Office of Technology Assessment, August 1991.
- Craig, G., Professor of Biology, University of Notra Dame, letter to P.T. Jenkins, Office of Technology Assessment, Mar. 14, 1992.
- 22. Craven, R.B. et al., "Importation of Aedes albopictus and Other Exotic Mosquito Species into the United States in Used Tires from Asia," Journal of the American Mosquito Control Association, vol. 4, No. 2, 1988, pp. 138-42.
- 23. Crosby, M., Director, Division of Research, Sanctuaries and Reserves, National Ocean Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Washington, DC, personal communication to E.A. Chornesky, Office of Technology Assessment, Jan. 22, 1992.
- 24. Cunningham, 1. S., "The U.S. National Arboretum: Leader in Ornamental Plant Germplasm Collection," *Diversity*, No. 12, 1988.
- 25. DeFazio, P. et al., Members of Congress, letter to C.K. Yeutter, Secretary, U.S. Department of Agriculture, Dec. 5, 1990.
- 26. Deitrich, B., "State Girds to Battle Alien Invader: A Moth," Seattle Times, Nov. 19, 1991, p. A-1.

- 27. Dudley, T.R., Research Botanist and Project Leader, National Arboretum, Agricultural Research Service, U.S. Department of Agriculture, Washington, DC, personal communication to Office of Technology Assessment, Oct. 4, 1991.
- Duffy, L., Assistant Secretary for Environmental Restoration and Water Management, U.S. Department of Energy, Washington, DC, personal communication to S.M. Fondriest, Office of Technology Assessment, Jan. 2, 1992.
- Earl, R., Real Property Office, Department of Energy, personal communication to S.M.Fondriest, Office of Technology Assessment, Dec. 13, 1992.
- Edwards, G. B., Assistant Director, Fisheries Division, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC, letter to P.N. Windle, Office of Technology Assessment, Mar, 16, 1992.
- 31. Edwards, G.B. and Nottingham, D., Co-Chairs, U.S. Aquatic Nuisance Species Task Force, letter to E.A. Chornesky, Office of Technology Assessment, Nov. 25, 1992.
- 32. Elder, E., Chief Operations Officer, Domestic and Emergency Operations, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, personal communication to Office of Technology Assessment, Mar. 13, 1991.
- 33. Fens, J., Senior Operations Officer, Inspection and Compliance, Animal and Plant Health Inspection Service, personal communication to Office of Technology Assessment, Mar. 13, 1991.
- 34. Fornasari, L. et al., U.S. Department of Agriculture, Agricultural Research Service, Biological Control of Weeds Laboratory-Rome, Italy, "Overview of the U.S. Department of Agriculture Biocontrol of Weeds Laboratory—Europe, "Dec. No. 0018P, 1991.
- 35. Fritts, T.H., "The Brown Tree Snake, Boiga irregulars, A Threat to Pacific Islands," U.S. Fish and Wildlife Service, Biological Report, vol. 88, No. 31, September 1988.
- Gardner, D. E., U.S. Department of the Interior, National Park Service, "Role of Biological Control as a Management Tool in National Parks and Other Natural Areas," Technical Report NPS/NRUH/NRTR-90/01, September 1990.

- 37, Geiger, J. G., Acting Assistant Director, Fish and Wildlife Service, U.S. Department of the Interior, letter to J.A. Schmid, Mar. 29, 1991.
- Giamporcaro, D., TSCA Biotechnology Program, Chemical Control Division, Office of Pollution Prevention, U.S. Environmental Protection Agency, Washington, DC, personal communication to E.A. Chomesky, Office of Technology Assessment, Jan. 14, 1992,
- 39. Gillis, A. M., "Should Cows Chew Cheatgrass on Cornmonlands?" *Bioscience*, vol. 41, No. 10, November 1991, pp. 668-675.
- 40. Glosser, J.W., Director, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, testimony at hearings before the U.S. Senate Committee on Agriculture, Nutrition, and Forestry, Subcommittee on Agricultural Research and General Legislation, Preparation for the 1990 Farm Bill: Noxious Weeds, Mar. 28, 1990, pp. 350-354.
- 41. Glosser, J. W., Director, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, letter to The Honorable Tom **Daschle**, Apr. 17, 1990.
- 42. Glosser, J.W., Director, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, testimony at hearings before the U.S. House Committee on Appropriations, Subcommittee on Agriculture, Rural Development, and Related Agencies, Hearings on Agriculture, Rural Development and Related Agencies Appropriations for 1992: Part 4, Serial No. 43-1710 (Washington, DC: Government Printing Office, May 1991), pp. 271467.
- 43. **Grable**, K., Plant Pathologist, U.S. Environmental Protection Agency, personal **communica**ion to **E.A. Chornesky**, Office of Technology Assessment, Mar. 31, 1992.
- 44. Greater Yellowstone Coordinating Committee, Billings, MT, "Guidelines for Coordinated Management of Noxious Weeds in the Greater Yellowstone Area, 'undated.
- 45. Griswold, B., Program Director, Marine Advisory Services, National Sea Grant College Program, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Silver Spring, MD, FAX to E.A. Chornesky, Office of Technology Assessment, Mar. 31, 1992.

- Heck, J. A., Library of Congress, Congressional Research Service, "National Wildlife Refuges: Places to Hunt?" July 28, 1992.
- 47. Hester, F. E., "The U.S. National Park Service Experience with Exotic Specie s,' *Natural Areas Journal*, vol. 11, No. 3, July 1991, pp. 127-128.
- Hetke, S. F., Associate Director for Research Operations, Environmental Research Laboratory, U.S. Environmental Protection Agency, Duluth, MN, letter to E.A.Chornesky, Office of Technology Assessment, Jan. 15, 1992.
- Holmes, R., Director, Division of Fish and Wildlife, Minnesota Department of Natural Resources, letter to R.A. Peoples, Fish and Wildlife Service, Department of the Interior, Dec. 28, 1992.
- Hunsaker, C.T. and Carpenter, D. E., Ecological Indicators for the Environmental Monitoring and Assessment Program (Research Triangle Park, NC: U.S. Environmental Protection Agency, Office of Research and Development, 1990).
- Johnston, G. H., Chief of Wildlife and Vegetation Division, Natural Resources Program Branch, National Park Service, U.S. Deaprtment of the Interior, personal communication, July 10, 1991, Mar. 13, 1992.
- Johnston, G.H. and Dennis, J. G., Wildlife and Vegetation Division, Natural Resources Program Branch, National Park Service, U.S. Department of the Interior, letter to P.N. Windle, Office of Technology Assessment, Jan. 13, 1992.
- 53. Kaplan, J. K., "Bring 'Em Back Alive and Growing,' *Agricultural Research, vol. 39, No. 7*, July 1991, pp. 4-13.
- 54. Kim, K.C. and Wheeler, A. G., Jr., "Pathways and Consequences of the Introduction of Non-Indigenous Insects and Arachnids in the United State s," contractor report prepared for the Office of Technology Assessment, Washington, DC, December 1991.
- 55. Kludy, D. H., "Federal Policy on Non-Indigenous Species: The Role of the United States Department of Agriculture's Animal and Plant Health Inspection Service," contractor report prepared for the Office of Technology Assessment, Washington, DC, December 1991.

- Krugman, S., U.S. Department of Agriculture, Forest Service, personal communication to J.A. Schnittker, 1991.
- Kutz, R., Deputy Director EMAP, U.S. Environmental Protection Agency, personal communication to E.A. Chornesky, Office of Technology Assessment, Jan. 13, 1992.
- Lima, P., Entomologist, BATS, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, personal communication to S.M. Fondriest, Office of Technology Assessment, Nov. 12, 1992.
- Loope, L., Research Biologist, U.S. Department of the Interior, National Park Service, letter to P.N. Windle, Office of Technology Assessment, July 28, 1992.
- 60. Mack, R. N., "Pathways and Consequences of the Introduction of Non-Indigenous Plants in the United States," contractor report prepared for the Office of Technology Assessment, September 1991.
- Mack, R. N., "Additional Information on Non-Indigenous Plants in the United States,' Contractor Report Prepared for the Office of Technology Assessment, October 1992.
- 62. Marroquin, R., Entomologist, U.S. Army Engineering and Housing Support Center, Department of the Army, personal communication to S.M. Fondriest, Office of Technology Assessment, Feb. 7, 1992.
- 63. McCann, J. A., Director, National Fisheries Research Center, Fish and Wildlife Service, U.S Department of the Interior, Gainesville, FL, personal communication to E.A. Chomesky, Office of Technology Assessment, Mar. 23, 1993.
- 64. Melland, R. B., Director, Animal and Plant Health Inspection Service, U.S., Department of Agriculture, testimony at hearings before the U.S. House Committee on Appropriations, Subcommittee on Agriculture, Rural Development, and Related Agencies, Hearings on Agriculture, Rural Development, Food and Drug Administration, and Related Agenciew Appropriations for 1993, Part 3, Serial No. 54-8880 (Washington, DC: Government Printing Office, March 1992), pp. 211-314.

- 65. Miller, S., Chief, Division of Land and Water Resources, Bureau of Indian Affairs, U.S. Department of the Interior, personal communication to E.A. Chornesky, Office of Technology Assessment, Oct. 26, 1992.
- 66. NationalFish and Wildlife Foundation, Washington, DC, "Fiscal Year 1991 Budget Recommendations for United States Department of the Interior, National Park Service, Natural Resource Management Program, ' 1990.
- 67. National Fishand WildlifeFoundation, Washington, DC, "Fiscal Year 1992 Wildlife and Fisheries Assessment," April 1991.
- 68. National Fish and Wildlife Foundation, Washington, DC, Internal Progress Report on the "Bring Back the Natives Projects, "Mar. 1, 1992.
- 69. Newman, J. B., Director Ecological Sciences, Soil Conservation Service, U.S. Department of Agriculture, personal communication to E.A. Chornesky, Office of Technology Assessment, July 11, 1991.
- 70. Nickum, J., National Aquiculture Coordinator, Fish and Wildlife Service, U.S. Department of Interior, Washington, DC, personal communication to E.A. Chornesky, Office of Technology Assessment, Aug. 26, 1991.
- 71. Noldan, H. K., Acting Assistant Director, Land and Renewable Resources, Bureau of Land Management, Washington, DC, internal information bulletin No. 91-266 to all State Directors, Feb. 6, 1991.
- 72. Peoples, R. A., Resource Analyst, Fish and Wildlife Service, U.S. Department of Interior, personal communication to E.A. Chornesky, Office of Technology Assessment, Aug. 19, 1991, Mar. 4, 1992.
- 73. Perez, A., Quarantine Division, Center for Disease Control, Public Health Service, Atlanta, GA, personal communication to S.M. Fondriest, Office of Technology Assessment, Jan. 17,1992.
- 74. Robertson, F, D., "Rise to the Future: The Forest Service Fisheries Program," Fisheries, vol. 13, No. 3, May-June 1988, pp. 22-23.
- 75. Schnittker, J., 'Federal Policy on Non-Indigenous Species: An Overview of the U.S. Department of Agriculture, " contractor report prepared for the Office of Technology Assessment, December 1991.

- 76. Schwegman, J. E., "Newsletter of the Illinois Native Plant Conservation Program Division of Natural Heritage, Illinois Department of Conservation," Illinoensis, vol. 7, No. 2, July 1991.
- 77. Shands, H. L., Fitzgerald, P.J., and Eberhart, S. A., "Program for Plant Germplasm Preservation in the United States: the U.S. National Plant Germplasm System," Biotic Diversity and Germplasm Preservation, Global Imperatives, L. Knutson and A.K. Stoner (eds.) (Netherlands: Kluwer Academic Publishers, 1989), pp. 97-115.
- 78. Shannon, M., Assistant Director for Planning and Design, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, personal communication to P.T. Jenkins, Office of Technology Assessment, May 19, 1992.
- 79. Sharp, C., "The Soil Conservation Service Perspective," paper presented at the 16th Annual Natural Areas Conference, Knoxville, TN, Oct.
- 80. Sharp, C., National Plant Materials Specialist, Soil Conservation Service, U.S. Department of Agriculture, personal communication to E.A. Chornesky, Office of Technology Assessment, Aug. 15, 1991.
- 81. Sharp, C., National Plant Materials Specialist, Soil Conservation Service, U.S. Department of Agriculture, letter to P.N. Windle, Office of Technology Assessment, July 24, 1992.
- 82. Siehl, G.H., "Natural Resource Issues in National Defense Programs, " Congressional Research Service Report to Congress, 91-781 ENR, Oct. 31, 1991₄
- 83. Singletary, H. M., Director, Plant Industry Division, North Carolina Department of Agriculture, testimony at hearings before the U.S. Senate Committee on Agriculture, Nutrition, and Forestry, Subcommittee on Agricultural Research and General Legislation, Preparation for the 1990 Farm Bill: Noxious Weeds, Mar. 28, 1990, pp. 354-357.
- 84. Smith, C., Professor, Department of Botany, University of Hawaii at Manoa, personal communication to E.A. Chornesky, Office of Technology Assessment, May 6, 1993.
- 85. Stanley, J. G., Peoples, R. A., Jr., and McCann, J. A., "Legislation and Responsibilities Related to Importation of Exotic Fishes and Other

- Aquatic Organisms,' Canadian Journal of Fisheries and Aquatic Organisms, vol. 48, supl. 1, 1991, pp. 162-166.
- 86. Steering Committee for the 75th Symposium, National Parks for the 21st Century: The Vail Agenda Report and Recommendations to the Director of the National Park Service, National Park Service Document No, D-726, Mar. 25, 1992.
- 87. Thin, D., Department of Plant Soil and Environmental Sciences, University of Idaho, Moscow, ID, personal communication to R.N. Mack, Pullman, WA, Oct. 21, 1992.
- 88. Torchio, P.F. et al., "Introduction of the European Bee, Osmia cornuta, into California Almond Orchards (Hymenoptera: Megachilidae), Environmental Entomology, vol. 16, No. 3, 1987, pp. 664-667.
- 89. Troust, J., Senior Environmental Specialist, Bureau of Reclamation, U.S. Department of the Interior, FAX to E.A. Chornesky, Office of Technology Assessment, Nov. 13, 1992.
- 90. Turner, J. F., Director, Fish and Wildlife Service, U.S. Department of Interior, Washington, DC, internal agency memorandum, Mar. 22, 1990.
- 91. U.S. Aquatic Nuisance Species Task Force, "Proposed Aquatic Nuisance Species program," Sept. 28, 1992.
- 92. U.S. Congress, General Accounting Office, Forest Service: Difficult Choices Face the Future of the Recreation Program, RCED-91-115 (Gaithersburg, MD: U.S. General Accounting Office, Apr. 15, 1991).
- 93. U.S. Congress, General Accounting Office, Rangeland Management: Forest Service Not Performing Needed Monitoring of Grazing, RCED-91-148 (Gaithersburg, MD: U.S. General Accounting Office, May 16, 1991).
- 94. U.S. Congress, General Accounting Office, National Forests: Funding Fish and Wildlife Projects, RCED-91-113 (Gaithersburg, MD: U.S. General Accounting Office, June 12, 1991).
- 95. U.S. Congress, House Committee on Appropriations, Subcommittee on Agriculture, Rural Development, and Related Agencies, Hearings on Agriculture, Rural Development and Related Agencies Appropriations for 1992: Part 2, Serial

- No. 43-149 0 (Washington, DC: Government Printing Office, April 1991).
- 96. U.S. Congress, House Committee on Appropriations, Subcommittee on Agriculture, Rural Development, and Related Agencies, Hearings on Agriculture, Rural Development and Related Agencies Appropriations for 1992: Part 5, Serial No. 43-194 (Washington, DC: Government Printing Office, April 1991).
- **97.** U.S. Congress, House Committee on Appropriations, Subcommittee on Agriculture, Rural Development, and Related Agencies, Hearings on Agriculture, Rural Development and Related Agencies Appropriations for 1992: Part 4, Serial No. 43-171 0 (Washington, DC: Government Printing Office, May 1991).
- 98. U.S. Congress, House Committee on Appropriations, Subcommittee on Agriculture, Rural Development, and Related Agencies, Hearings on Agriculture, Rural Development, Food and Drug Administration, and Related Agenciew Appropri ations for 1993, Part 3, Serial No. 54-888 0 (Washington, DC: Government Printing Office, March 1992).
- 99. U.S. Congress, House Committee on Appropriations, Subcommittee on Agriculture, Rural Development, and Related Agencies, Hearings on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations for 1993: Part 4, Serial No. 054-898 0 (Washington, DC: Government Printing Office, Mar, 25, 1992).
- 100, U.S. Congress, House Committee on Appropriations, Subcommittee on the Department of the Interior and Related Agencies, Hearings on Justifications of the Budget Estimates for the Bureau of Lund Management, Fish and Wildlife Service, and National Park Service, Serial No. 40-442 (Washington, DC: Government Printing Office, 1991).
- 101. U.S. Congress, House Committee on Appropriations, Subcommittee on the Department of the Interior and Related Agencies, Justification of the Budget Estimates: Part 2, Serial No. 52-547 0 (Washington, DC: Government Printing Office, 1992).
- 102. U.S. Congress, House Committee on Merchant Marine and Fisheries, Subcommittee on Ocean-

- ography, Great Lakes and the Outer Continental Shelf, Hearings on Present Activities and Future Needs of Federal Programs Directed at Improving the Water Quality of the Great Lakes, Serial No. 102-15, Apr. 30, 1991.
- U.S. Department of Agriculture, "Policy of Noxious Weed Management,' departmental regulation, 1990.
- 104. U.S. Department of Agriculture, Agricultural Marketing Service, "This is AMS," March 1991.
- 105. U.S. Department of Agriculture, Agricultural Research Service, "Seeds for Our Future: The U.S. National Plant Germplasm System," December 1990.
- 106. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, "National Biological Control Institute," Information Sheet, undated.
- 107. U.S. Department of Agriculture, Economic Research Service, "The Conservation Reserve Program: Enrollment Statistics for Signup Periods 1-9 and Fiscal Year 1989,' Statistical Bulletin No. 811, 1990.
- 108. U.S. Department of Agriculture, Forest Service, "Forest Service Manual: Chapter 2640-Stocking and Harvesting," June 1, 1990.
- 109. U.S. Department of Agriculture, Forest Service, "Forest Service Manual: Chapter **2610**— Cooperative Relations," June 25, 1990,
- 110. U.S. Department of Agriculture, Forest Service, "Blue Mountains Forest Health Report: New Perspectives in Forest Health," April 1991.
- 111. U.S. Department of Agriculture, Forest Service, "Forest Service Manual 2600-Wildlife, Fish, and Sensitive Plant Habitat Management WO Amendment 2600-91-6," Sept. 24, 1991.
- U.S. Department of Agriculture, Forest Service, "Forest Service Manual: Chapter 2080-Noxious Weed Management," Interim Directive, Aug. 3, 1992.
- 113. U.S. Department of Agriculture, Soil Conservation Service, "Improved Conservation Plant Materials Released by the **SCS** and Cooperators Through December 1990," 1990.
- 114. U.S. Department of Agriculture, Soil Conservation Service, "National Plant Materials Manual

- (NPMM), 190-V, Second Edition," Sept. 9, 1990.
- 115, U.S. Department of Agriculture, Soil Conservation Service, "SCS National Plant Materials Program: Accomplishments and Opportunities," September 1990.
- 116. U.S. Department of Agriculture, Soil Conservation Service, "Plant Materials Centers: Finding Vegetative Solutions to Conservation Problems," June 1991.
- 117. U.S. Department of Agriculture, Soil Conservation Service, 'Draft Strategic Plan for **SCS** Plant Materials Center Program," Aug. 15, 1991.
- 118. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, "Great Lakes Environmental Research Laboratory: Annual Report FY 91," undated.
- 119. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, "The National Sea Grant College Program Annual Report FY 89," 1989.
- U.S. Department of Commerce, National Oceanic and Atmospheric Administration, "National Estuarine Research Reserve System Site Catalogue," 1990s
- 121. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Sea Grant College Program, "Second Annual Call for Research Proposals Related to Nonindigenous Species With Special Emphasis on the Zebra Mussel," 1992.
- 122. U.S. Department of Defense, "Department of Defense Directive: Natural Resources Management Program," Directive No. 4700.4, Jan, 24, 1989.
- 123. U.S. Department of Defense, "Legacy Resource Management Program," Report to Congress, September 1991.
- 124. U.S. Department of Defense, Department of the Air Force, "AF Regulation 400-21: Retrograde Material Preclearance Program, June 15, 1972,
- 125. U.S. Department of Defense, Department of the Air Force, "AF Regulation 126-1: Conservation and Management of Natural Resources," Oct. 21, 1988.
- 126. U.S. Department of Defense, Department of the Army, "Army Regulation 420-74: Natural Resource Management, Feb. 25, 1986.

- 127. U.S. Department of Defense, Department of the Army, "Army Regulation 420-76: Facilities Engineering Pest Management," June 3, 1986.
- 128. U.S. Department of Energy, "Real Property Statistics," Sept. 30, 1991.
- 129, U.S. Department of the Interior, Bureau of Indian Affairs, "1992 Noxious Weed Plan," executive summary, Washington, DC, 1992.
- 130. U.S. Department of the Interior, Bureau of Land Management, "Fish and Wildlife 2000: A Plan for the Future," undated.
- 131. U.S. Department of the Interior, Bureau of Land Management, "BLM Manual: 6820-Wildlife Introduction and Transplants," Oct. 20, 1976.
- 132. U.S. Department of the Interior, Bureau of Land Management, "Northwest Area Noxious Weed Control Program: Final Environmental Impact Statement," December 1985.
- 133. U.S. Department of the Interior, Bureau of Land Management, "BLM Manual: 1745—Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife and Plants, 'revision of section 6820, draft, Aug. 15, 1986.
- 134. U.S. Department of the Interior, Bureau of Land Management, 'Draft Environmental Impact Statement: Vegetation Treatment on BLM Lands in Thirteen Western States," 1989.
- 135. U.S. Department of the Interior, Bureau of Land Management, "BLM Manual: 9014---Use of Biological Control Agents of Pests on Public Lands," Oct. 30, 1990.
- 136. U.S. Department of the Interior, Bureau of Land Management, "Evaluation: Bureauwide Noxious Weed Program, ' internal agency review, draft, December 1991.
- 137. U.S. Department of the Interior, Bureau of Reclamation, Lower Colorado Region, 'Vegetation Management Study: Lower Colorado River— Phase I," Boulder City, NV, September 1992.
- 138. U.S. Department of the Interior, Fish and Wildlife Service, "NEPA in Federal Aid Proposals: Guidance to the States,' September 1980.
- 139. U.S. Department of the Interior, Fish and Wildlife Service, "Federal Aid Manual," 1982.
- 140. U.S. Department of the Interior, Fish and Wildlife Service, Internal memorandum from the Director to the Regional Directors concerning

- "potential policy initiative—reducing risks of aquatic organism introductions," Oct. 20, 1987.
- U.S. Department of the Interior, Fish and Wildlife Service, Restoring America Wildlife (Washington, DC: U.S. Government Printing Office, 1987).
- 142. U.S. Department of the Interior, Fish and Wildlife Service, "Federal Aid in Fish and Wildlife Restoration," 1988.
- U.S. Department of the Interior, Fish and Wildlife Service, "Current Federal Aid Research Report: Fish 1990," report, 1990.
- 144. U.S. Department of the Interior, Fish and Wildlife Service, "Current Federal Aid Research Report: Wildlife 1990," report, 1990.
- 145. U.S. Department of the Interior, Fish and Wildlife Service, Law Enforcement Advisory Commission, "Report of Findings and Recommendations," June 15, 1990.
- U.S. Department of the Interior, Fish and Wildlife Service, "Triploid Grass Carp Report," 1990.
- U.S. Department of the Interior, Fish and Wildlife Service, "Vision for the Future: 1991 Total Quality Management Plan," May 1991.
- 148. U.S. Department of the Interior, National Park Service, "Management Policies," 1988.
- 149. U.S. Department of the Interior, National Park Service, and U.S. Department of Agriculture, Soil Conservation Service, *Native Plants for Parks*, *D-425* (Washington, DC: U.S. Government Printing Office, 1989).
- U.S. Department of the Interior, National Park Service, "1989 Inventory of Research Activities in the National Parks," Science Report NPS/NRWV/ NRSR-91/03, January 1991.
- 151. U.S. Department of the Interior, National Park *Service*, "1990 Inventory of Research Activities in the National Parks," Science report, 1992.
- 152. U.S. Department of the Interior, Office of Inspector General, "The Endangered Species Program, U.S. Fish and Wildlife Service,' Audit Report No. 90-98, September 1990.
- 153. U.S. Department of the Treasury, U.S. Customs Service, "Master Plan for Passenger Processing at United States Airports for the 1990' s," undated.

- 154, U.S. Department of the Treasury, U.S. Customs Service, "Importing Into the United States," September 1991.
- 155, U.S. Environmental Protection Agency, "Pesticide Assessment Guidelines: Microbial Pest Control Agents," March 1989.
- U.S. Environmental Protection Agency, EMAP Monitor," EPA-600/M-90/022, January 1991.
- U.S. Public Health Service, "MedicalEntomology-Ecology Branch (MEEB)," information brochure, draft, undated.
- 158. U.S. Public Health Service, "Public Health Screenings at U.S. Ports of Entry: A Guide for U.S. Immigration & Naturalization Service and U.S. Customs Service Inspectors," October 1991.
- 159. Versar, Inc., "Introduction of Pacific Salmonids into the Delaware River Watershed," draft environmental impact statement prepared for the U.S. Fish and Wildlife Service and the New Jersey Division of Fish, Game and Wildlife, July 25, 1991.
- 160. Wahle, C. M., Evaluation Team Leader, Office of Coastal Resources Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Washington, DC, personal communication to E.A. Chornesky, Office of Technology Assessment, Mar. 31, 1992.
- 161. Waters, L, H., Pest Management Specialist, Bureau of Land Management, U.S. Department of the Interior, Washington, DC, personal communication to E.A. Chornesky, Office of Technology Assessment, Sept. 5, 1991.
- 162, Weiss, M. J., Assistant Director Forest Pest Management, Forest Service, U.S. Department of Agriculture, Washington, DC, letter to P.N. Windle, Office of Technology Assessment, Feb. 5, 1992.
- 163. West, A. J., Deputy Chief of State and Private Forestry, Forest Service, U.S. Department of Agriculture, Washington, DC, letter to P.N. Windle, Office of Technology Assessment, Aug. 24, 1992,
- 164. Westbrooks, R. G., Station Leader, Whiteville Noxious Weed Station, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Whiteville, NC, letter to P.N. Windle,

- Office of Technology Assessment, Aug. 11, 1992.
- 165. White, G. A., "The U.S. Department of Agriculture's Plant Introduction Program-Safeguards Against Introducing Pests," 1991.
- 166. White, G. A., Shands, H. L., and Lovell, G. R., "History and Operation of the National Plant Germplasm System," Plant Breeding Reviews: The National Plant Germplasm System of the United States, Vol. 7, J. Janick (cd.) (Portland, OR: Timber Press, 1989), pp. 5-56.
- 167. Wilkinson, D., Marine Resource Management Specialist, Office of Protected Resources, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Silver Spring, MD, personal communications to E.A. Chornesky, Office of Technology Assessment, Jan. 22,1992 and Mar. 31, 1992.
- 168. Williamson, W., Director of Range Management, Forest Service, U.S. Department of Agriculture, Washington, DC, personal communication to E.A. Chornesky, Office of Technology Assessment, July 19, 1991.
- Witfield, P., Deputy Assistant Secretary, Environmental Restoration, U.S. Department of Energy, Washington, DC, personal communication to S.M. Fondriest, Office of Technology Assessment, Jan. 9, 1992.
- 170. Witt, 1., Policy and Program Development, Animal Plant Health Inspection Service, U.S. Department of Agriculture, Washington, DC, FAXes to E.A. Chornesky, Office of Technology Assessment, Nov. 9 and Nov. 10, 1992.

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- Alexander, D., Pest Exclusion Specialist, Washington Department of Agriculture, Olympia, WA, personal communication to P.T. Jenkins, Office of Technology Assessment, Feb. 15, 1991.
- Alfieri, S. A., Jr., Assistant Director, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Tallahassee FL, "Regulatory Pest Control Philosophy: Views and Assessment," paper presented at the meeting of the National Plant Board, Kalispell, MT, August 1991.

- Anonymous, "Guidelines for Coordinated Management of Noxious Weeds in the Greater Yellowstone Area, adopted by parties to Memorandum of Understanding between the Governor of the State of Wyoming et al., dated Sept. 30, 1990.
- Anonymous, "Wyoming Noxious Weed-Free Forage," pamphlet issued by Wyoming Department of Agriculture et al., Cheyenne, WY, 1991,
- Anonymous, "Non-Natives Bill Triggers Concern," American Horticulturist, May 1992, p. 12.
- Bean, M. J., "The Role of the United States Department of Interior in NIS Issues," contractor report prepared for the Office of Technology Assessment, November 1991.
- Britton, J. C., "Pathways and Consequences of Introductions of Non-Indigenous Freshwater, Terrestrial, and Estuarine Mollusks in the United States,' contractor report prepared for the Office of Technology Assessment, October 1991.
- California Department of Food and Agriculture, Division of Plant Industry, "Annual Report," Sacramento, CA, 1990.
- Clark, J. A., Environmental Defense Fund, written statement submitted to the Intentional Introductions Policy Committee of the Aquatic Nuisance Species Task Force, Feb. 26, 1992.
- Cohn, D., "Plan to Revive Bay's Oysters Creates a Regional Dispute," Washington Post, Nov. 18, 1991, pp. Al, A12.
- Collins, R. A., "California's Approach to Risk Reduction in the Introduction of Exotic Species," *Dispersal of Living Organisms into Aquatic Ecosystems*, A. Rosenfield and R. Mam (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 361-364.
- Commissioner, Maine Department of Marine Resources, Code of Maine Rules, Ch. 24, Basis Statement, Aug. 15, 1984.
- 13. Courtenay, W. R., Jr., "Pathways and Consequences of Introductions of Non-Indigenous Fishes in the United States," contractor report prepared for the Office of Technology Assessment, August 1991.
- 14. Doren, R. F., Assistant Research Director, Everglades National Park, Homestead, FL, personal

- communication to P.T. Jenkins, Office of Technology Assessment, Jan. 21, 1992.
- 15. Dowell, R.V. and Krass, C. J., "Exotic Pests Pose Growing Problem for California," *California Agriculture*, vol. 46, No. 1, January-February 1992, pp. 6-12.
- 16. Edwards, G. B., Assistant Director, Fisheries Division, Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC, testimony at hearings before the House Subcommittee on Oversight and Investigations of the Committee on Merchant Marine and Fisheries, July 12, 1991, Serial No. 102-28, pp. 32-3.
- 17. Elder, E. W., Chief Operations Officer, Domestic and Emergency Operations, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville, MD, personal communication to P.T. Jenkins, Office of Technology Assessment, Mar. 13, 1991.
- 18. Environmental Law Institute, Law *of Environmental Protection, Vol.I (New* York, NY: Clark Boardman Co., 1990), p. 6-24.
- Federal Noxious Weed Committee, Weed Science Society of America, "Points of Discussion on Six Proposed Amendments to the Federal Noxious Weed Act," 1989.
- Fleck, A., Enforcement Officer, Utah Division of Wildlife Resources, Salt Lake City, UT, personal communication to P.T. Jenkins, Office of Technology Assessment, Sept. 9, 1992.
- 21. Gilbert, B., "Coyotes Adapted to Us, Now We Have to Adapt to Them," *Smithsonian*, April 1991, pp. 69-78.
- Girard, N., Counsel, New Hampshire Fish and Game Department, Concord, NH, personal communication to P.T. Jenkins, Office of Technology Assessment, May 6, 1992.
- 23. Gomez, R., Chairman, U.S. Department of Agriculture Interagency Technical Working Group on the Africanized Honey Bee, Washington, DC, personal communication to P.T. Jenkins, Office of Technology Assessment, Sept. 9, 1992.
- Greenwalt, L. A., Vice-President, International Affairs, National Wildlife Federation, Washington, DC, personal communication to P.T. Jenkins, Office of Technology Assessment, Dec. 11, 1991.

- 25. Hardy, T.N., Administrator Coordinator, Quarantine Programs, Louisiana Department of Agriculture and Forestry, Baton Rouge, LA, letter to P.T. Jenkins, Office of Technology Assessment, Dec. 21, 1992.
- 26. Hocutt, C.H., "Toward the Development of an Environmental Ethic for Exotic Fishes," Distribution, Biology and Management of Erotic Fishes, W.R. Courtenay and J.R. Stauffer (eds.) (Baltimore, MD: Johns Hopkins Univ. Press, 1984), pp. 374-386.
- 27. Kahn, R. P., "Technologies To Maintain Biological Diversity: Assessment of Plant Quarantine Practices,' contractor report prepared for the Office of Technology Assessment, November 1985,
- 28. Kern, F.G. and Rosenfield, A., "Shellfish Health and Protection,' Dispersal of Living Organisms into Aquatic Ecosystems, A. Rosen field and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 313-323.
- 29. King, S.T. and Schrock, J.R., Controlled Wildlife— Vol. III: State Wildlife Regulations (Lawrence, KS: Assoc. of Systematic Collections, 1985).
- 30. Krantz, G. E., "Present Management Position on Crassostrea virginica in Maryland with Comments on the Possible Introduction of an Exotic Oyster, Crassostrea gigas," Introductions and Transfers of Marine Species, Achieving a Balance Between Economic Development and Resource Protection, Proceedings of Conference/ Workshop at Hilton Head, SC (Charleston, SC: SC Sea Grant Consortium, 1992), pp. 121-126.
- 31. Kurdila, J., "The Introduction of Exotic Species Into the United States: There Goes the Neighborhood!" Boston College Environmental Affairs Law Review, vol. 16, No. 1, 1988, pp. 95-118.
- 32. Lanka, B. et al., Wyoming Game and Fish Department, Game Division, Exotic Species Committee, Cheyenne, WY, "Analysis and Recommendations on the Applications by Mr. John T. Dorrance III to Import and Possess Native and Exotic Species," Mar. 1, 1990.
- 33. Mack, R. N., "Pathways and Consequences of Introductions of Non-Indigenous Plants in the United States-Additional Information, 'supplemental contractor report prepared for the Office of Technology Assessment, October 1992.

- 34. Mann, R., Burreson, E.M., and Baker, P.K., "The Decline of the Virginia Oyster Fishery in Chesapeake Bay: Considerations for Introduction of a Non-endemic Species, Crassostrea gigas (Thunberg)," Introductions and Transfers of Marine Species, Achieving a Balance Between Economic Development and Resource Protection, Proceedings of a Conference/Workshop at Hilton Head, SC (Charleston, SC: South Carolina Sea Grant Consortium, 1992), pp. 107-120.
- 35. Martin, G., "Hog Wild," Discover, vol. 11, No. 6, June 1990, pp. 43-46.
- 36. Mayer, J.J. and Brisbin, I. L., Wild Pigs in the United States: Their History, Comparative Morphology, and Current Status (Athens, GA: University of Georgia Press, 1991).
- 37. McCann, J, A., Director, National Fisheries Research Center, Fish and Wildlife Service, U.S. Department of the Interior, Gainesville, FL, letter to E.A. Chornesky, Office of Technology Assessment, Oct. 4, 1991.
- 38. McDowell, R., Director, Division of Fish, Game and Wildlife, New Jersey Department of Environmental Protection, Trenton, NJ, testimony at hearings before the House Committee on Merchant Marine and Fisheries, Subcommittee on Oversight and Investigations, Serial No. 102-28, July 12, 1991, p. 19.
- 39. Metterhouse, W. M., "Biological Control: State Regulator View Point," Regulations and Guidelines: Critical Issues in Biological Control-Proceedings of a USDA/CSRS National Workshop, R. Charudattan and H.W. Browning (eds.) (Gainesville, FL: Institute of Food and Agricultural Sciences, 1992).
- 40. Michigan Department of Natural Resources, Lansing, MI, Draft Briefing Statement on Zebra Mussels, August 1992.
- 41. Minnesota Interagency Exotic Species Task Force, St. Paul, MN, 'Report and Recommendations,' submitted to the Natural Resources Committees of the Minnesota House and Senate. July 1991.
- 42. Montana Department of Fish, Wildlife and Parks, Wildlife Division, "Draft summary of Background Information Pertaining to Regulation of the Game Farm Industry," 1992.

- 43. Moyle, P. B., Department of Wildlife and Fisheries Biology, University of California, Davis, CA, letter to P.N. Windle, Office of Technology Assessment, Dec. 16, 1991.
- 44. Mullin, B., Weed Coordinator, Montana Department of Agriculture, Helena, MT, letter to P.T. Jenkins, Office of Technology Assessment, Feb. 18, 1992.
- 45. Musgrave, R., Program Director, Center for Wildlife Law, University of New Mexico Law School, Albuquerque, NM, personal communication to P.T. Jenkins, Office of Technology Assessment, Jan. 16, 1992.
- 46. Nettles, V., Director, Southeast Cooperative Wildlife Disease Study Center, Athens, GA, personal communication P.T. Jenkins, Office of Technology Assessment, Feb. 10, 1992.
- 47. Nickum, J., National Aquiculture Coordinator, Fish and Wildlife Service, Department of the Interior, Washington, DC, personal communication to E.A. Chornesky, Office of Technology Assessment, Aug. 26, 1991.
- 48. Old, R. R., Weed Diagnostician, University of Idaho, Moscow, ID, letter to P.N. Windle, Office of Technology Assessment, Oct. 28, 1991.
- 49. Regelbrugge, C., Director of Regulatory Affairs and Grower Services, American Association of Nurserymen, Washington, DC, letter to P.N. Windle, Office of Technology Assessment, Aug. 10, 1992.
- 50. Rosenberg, D, Y., "The Interaction of State and Federal Quarantines in the U.S.,' Plant Protection and Quarantine-Vol. III, R.P. Kahn (cd.) (Boca Raton, FL: CRC Press, 1989), pp. 59-74.
- 51. Scarratt, D.J. and Drinnan, R. E., "Canadian Strategies for Risk Reductions in Introductions and Transfers of Marine and Anadromous Species, Dispersal of Living Organisms into Aquatic Ecosystems, A. Rosenfield and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 377-385.
- 52. Schmidt, B. R., Chief of Fisheries, Division of Wildlife Resources, Utah Department of Natural Resources, Salt Lake City, UT, letter to P.N. Windle, Office of Technology Assessment, Dec. 16, 1991.

- 53. Schmitz, D. C., Bureau of Aquatic Plant Management, Florida Department of Natural Resources, Tallahassee, FL, memorandum to Jeremy Craft, Florida Division of Resource Management, Aug. 9, 1988.
- 54. Schmitz, D. C., Bureau of Aquatic Plant Management, Florida Department of Natural Resources, Tallahassee, FL, testimony at public hearing before the Intentional Introductions Policy Committee of the U.S. Aquatic Nuisance Species Task Force, Feb. 26, 1992.
- 55. Schwegman, J., Botany Program Manager, Illinois Department of Conservation, Springfield, IL, "A State Program to Combat Exotic Weeds in Natural Communities," Apr. 1, 1989,
- 56. Scribner, J. D., Attorney, Sacramento, CA, letter to P.N. Windle, Office of Technology Assessment, Feb. 3, 1992.
- 57. Seed World, Seed Trade Buyers Guide, vol. 129, No. 4, April 1991.
- 58. Siddiqui, I. A., Assistant Director, California Department of Food and Agriculture, Sacramento, CA, testimony at hearings before the Senate Committee on Governmental Affairs, Subcommittee on Federal Services, Post Office, and Civil Service, Postal Implementation of the Agricultural Quarantine Enforcement Act, June 5, 1991.
- 59. South Florida Exotic Pest Plant Council, Tallahassee, FL, "Draft Model Exotic Species Ordinance for Municipalities and Counties in South Florida," Nov. 20, 1985.
- 60. Southeast Cooperative Wildlife Disease Study Center, College of Veterinary Medicine, University of Georgia, Athens, GA, "Model for State Regulations Pertaining to Captive Wild and Exotic Animals," Oct. 12, 1988.
- 61. Taylor, O., Professor of Entomology, University of Kansas, Lawrence, KS, personal communication to P.T. Jenkins, Office of Technology Assessment, Sept. 9, 1992.
- 62. Temple, S.A. and Carroll, D. M., "Pathways and Consequences of Introductions of Non-Indigenous Vertebrates in the United States, " contractor report prepared for the Office of Technology Assessment, October 1991.

- 63. Thompson, D.Q. et al., U.S. Department of Interior, Fish and Wildlife Service, "Spread, Impact and Control of Purple Loosestrife (Lythrum Salicaria) in North American Wetlands," 1987.
- 64. U.S. Aquatic Nuisance Species Task Force, 'proposedAquatic Nuisance Species Program,' Sept. 28, 1992.
- 65. U.S. Congress, House Committee on Appropriations, Subcommittee on the Department of the Interior and Related Agencies, Hearings on Department of the Interior and Related Agencies Appropriations for 1992: Part 3, Serial No. 40 4440, 1991.
- 66. U.S. Department of Interior, Fish and Wildlife Service, "Policies for Reducing Risks Associated with Introductions of Aquatic Organisms," Executive Summary and Discussion Document, Washington, DC, Oct. 14, 1987.
- 67. Waples, R.S. et al., Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Seattle, WA, "NOAA Technical Memorandum NMFS F/NWC-201—Status Review for Snake River Fall Chinook Salmon," June 1991.
- 68. Waterworth, H. E., "Control of Plant Diseases by Exclusion: Quarantines and Disease-free Stocks" *Handbook of Pest Management in Agriculture, Vol. I*, D. Pimental et al. (eds.) (Boca Raton, FL: CRC Press, Inc., 1981), pp. 269-295.
- 69. Westman, W. E., "Park Management of Exotic Plant Species: Problems and Issues," *Conservation Biology*, vol. 4, No. 3, 1990, pp. 251-58.
- Wingate, P. J., Minnesota Department of Natural Resources, Fisheries Section, St. Paul, MN, "U.S. States' Views and Regulations on Fish Introductions," 1990.
- 71, Wingate, P. J., Fisheries Research Manager, Fisheries Section, Minnesota Department of Natural Resources, St. Paul, MN, letter to Jack Baughman, Environmental Defense Fund, July 16, 1991.
- 72. Wingate, P.J., Fisheries Research Manager, Fishcries Section, Minnesota Department of Natural Resources, St. Paul, MN, personal communication, P.T. Jenkins, Office of Technology Assessment, Jan. 23, 1992.

CHAPTER 8: TWO CASE STUDIES: NON-INDIGENOUS SPECIES IN HAWAII AND FLORIDA

- 1. American Ornithologists' Union, *Check-list of North American Birds* (Washington, DC: Amerian ornithologists' Union, 1983).
- 2. Anonymous, "Preaching to Brazil From Hawaii," New *York Times*, July 24, 1990.
- 3. Austin, D. F., "Exotic Plants and Their Effects in Southeastern Florida," *Environmental Conservation*, vol. 5, No. 1, 1978, pp. 25-34.
- 4. Austin, D, F., "Vegetation on the Florida Atlantic University Ecological Site, *Florida Scientist* (*Biol. Sci.*), vol. 53, No. 1, 1990, pp. 11-27.
- Balciunas, J.K. and Center, T.D., "Biological Control of *Melaleuca quinquenervia*: Prospects and Conflicts," *Proceedings of the Symposium* on Exotic Pest Plants, T.D. Center et al. (eds.) (Washington, DC: U.S. Department of the Interior, National Park Service, 1991).
- 6. Beardsley, J.W., Jr., "New Immigrant Insects in Hawaii: 1962 through 1976," *Proceedings of the Hawaiian Entomological Society*, vol.13, No. 1, April 1979, pp. 35-44.
- Beardsley, J. W., Jr., University of Hawaii at Manoa, Honolulu, HI, "Introduction of Arthropod Pests into the Hawaiian Islands," paper presented at Workshop on Exotic Pests in the Pacific, University of Guam, May 31, 1990.
- 8. Beardsley, J, W., Jr., Chairman, Entomology Department, University of Hawaii at Manoa, Honolulu, HI, personal communication to K. Desmond, Oct. 19, 1990.
- Belden, R. C., Wild Hog Stocking: A Discussion of Issues (Tallahassee, FL: Florida Game and Fresh Water Fish Commission, 1990).
- Brown, R.S. et al., "Resource Guide to State Environmental Management," Council of State Governments, 1990, as cited in World Resources Institute, *The 1992 Information Please Environmental Almanac* (Boston, MA: Houghton Mifflin Co., 1992), p. 196.
- Brown, T., Lieutenant Colonel, Military Customs Inspection, U.S. CINCPAC, Camp Smith, HI, personal communication to C. Mlot, Apr. 13, 1992.
- 12. Buck, M.E., Administrator, Hawaii Department of Land and Natural Resources, Honolulu, HI,

- personal communication to K. Desmond, Oct. 11, 1990.
- 13. Buck, M. E., Administrator, Hawaii Department of Land and Natural Resources, Honolulu, HI, personal communication to C, Mlot, Feb. 10, 1992.
- Burkhead, N.M. and Williams, J. D., "Research on the Okaloosa Darter, Focuses on Competition and Habitat Use," *Endangered Species Techni*cal Bulletin, vol. 15, No. 11, 1990, pp. 5-6.
- Canfield, D. E., Jr., Maceina, M. J., and Shireman, J. V., "Effects of Hydrilla and Grass Carp on Water Quality in a Florida Lake," Water Resources Bulletin, vol. 19, No. 5, September/ October, 1983, pp. 773-778.
- Carey, J. R., "Establishment of the Mediterranean Fruit Fly in California," *Science, vol. 253, No. 5026*, Sept. 20, 1991, p. 1371.
- Carlquist, S., "Worst-case Scenarios for Island Conservation: The Endemic Biota of Hawaii," Ecological Restoration of New Zealand Islands, Conservation Sciences Publication No. 2, D.R. Towns et al. (eds.) (Wellington, New Zealand: Department of Conservation, 1990), pp. 207-212.
- 18, Carr, A., "Armadillo Dilemma, Animal Kingdom, vol. 85, No. 5, September/October 1983, pp. 40-43.
- 19. Cassani, J. R., "Arthropods on Brazilian Peppertree, (*Schinus terebinthifolius*) (Anacardiaceae), in South Florida, 'Florida Entomologist, vol. 69, No. 1, 1986, pp. 184-196.
- Clark, R., Steck, G. J., and Weems, H. V., Jr., "Detection, Quarantine, and Eradication of Fruit Flies Invading Florida, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville, FL, undated.
- Cochran, M. J., 'Applying the General Framework for Benefit Costs Analysis on Non-Indigenous Species to the Case of Melaleuca,' contractor report prepared for the Office of Technology Assessment, March 1992.
- 22. Council on Environmental Quality, *Environmental Trends* (Washington, DC: Council on Environmental Quality, 1989).
- 23. Courtenay, W. R., Jr. and Robins, C. R., "Exotic Aquatic Organisms in Florida With Emphasis on Fishes: A Review and Recommendations," *Trans-*

- actions of the American Fisheries Society, vol. 101, No. 1, January/February 1973, pp. 1-12.
- **24.** Courtenay, W. R., Jr. et al., "Exotic Fishes in Fresh and Brackish Waters of Florida," *Biological Conservation*, vol. **6, No. 4, 1974,** pp. 292-302.
- **25.** Courtenay, W.R., Jr. and Stauffer, J. R., Jr., "The Introduced Fish Problem and The Aquarium Fish Industry," *Journal of World Aquiculture Society*, vol. 21, No. 3, September 1991, pp. 145-159.
- **26.** Cuddihy, L, W., Stone, C. P., and Tunison, J.T., "Alien Plants and their Management in Hawaii Volcanoes National Park," *Transactions of the Western Section of the Wildlife Society*, vol. 24, February 1988, pp. 42-46.
- 27, Cuddihy, L.W. and Stone, C. P., Alteration of Native Hawaiian Vegetation: Effects of Humans, Their Activities and introductions (Honolulu, HI: University of Hawaii Press, 1990).
- **28.** Denmark, H.A. and Porter, J. E., "Regulation of Importation of Arthropods Into and of Their Movement Within Florida," *Florida Entomologist*, vol. **56**, **No. 4**, **1973**, pp. 347-358.
- 29, Diamond, C., Davis, D., and Schmitz, D. C., "Economic Impact Statement: The Addition of Melaleuca quinquenervia to the Florida Prohibited Aquatic Plant List, "Proceedings of the Symposium on Exotic Pest Plants, T.D. Center et al. (eds.), Technical Report NPS/NREVER/NRTR-91/06 (Washington, DC: U.S. Department of the Interior/National Park Service, 1991).
- 30! Doren, R.F. and Whiteaker, L. D., "The Exotic Pest Plant Council: An Example of Interagency Cooperation to Solve Resource Related Problems," *Proceedings of the Symposium on Exotic Pest Plants*, T.D. Center et al. (eds.), Technical Report NPS/NREVER/NRTR-91 -06 (Washington, DC: U.S. Department of the Interior/ National Park Service, 1991).
- 31. Duda, M. D., "Blackmailed Jackrabbit Importation: Potential Impacts on Florida's Natural Environment, 'Florida Game and Fresh Water Fish Commission, Tallahassee, FL, 1986.
- 32. Engbring, J. and Fritts, T. H., "Demise of an Insular Avifauna: The Brown Tree Snake on Guam," *Transactions of the Western Section of the Wildlife Society*, vol. 24, 1988, pp. 31-37.

- 33. Esser, R. P., O'Bamon, J.H., and Riherd, C. C., "The Citrus Nursery Site Approval program for Burrowing Nematode and Its Beneficial Effect on the Citrus Industry of Florida," Bulletin OEPP/EPPO(European Plant Protection Organization), No. 18, 1988, pp. 579-586.
- **34.** Everglades Coalition, "Everglades in the 21st Century, The Water Management Future," 1992.
- Ewel, J.J., "Invasibility: Lessons from South Florida," Ecology of Biological Invasions of North America and Hawaii, H.A. Mooney and J.A. Drake (eds.) (New York, NY: Springer-Verlag, 1986).
- **36.** Exotic Pest Plant *Council, Newsletter, vol.* 1, No. 3, summer, 1991.
- 37. Exotic Pest Plant *Council, Newsletter*, vol. 2, No. 2, spring, 1992.
- 38. Frank, J. H., 'Mole Crickets and Arthropod Pests of Turf and Pastures, 'Classical Biological Control in the Southern United States,' D.H. Habeck et al. (eds.), Southern Cooperative Series Bull. No. 355 (Gainesville, FL: Institute of Food and Agricultural Sciences, University of Florida, 1990).
- 39. Frank, J.H. and McCoy, E. D., 'The Immigration of Insects to Florida, with a Tabulation of Records Published since 1970," *Florida Entomologist*, vol. 75, No. 1, 1992, pp. 1-28.
- 40. Funasaki, G.Y. et al., "A Review of Biological Control Introductions in Hawaii: 1890 to 1985," *Proceedings of the Hawaii Entomological Society*, vol. 28, May 31, 1988, pp. 105-160.
- 41. Gagné, W. C., "Conservation Priorities in Hawaiian Natural Systems," *Bioscience*, vol. 38, No. 4, April 1988, pp. 264-271,
- 42. Gleason, P.J. (cd.), Environments of South Florida, Present and Past II (Miami, FL: Miami Geological Society, 1984).
- 43. Hadfield, M., Zoologist, University of Hawaii, Honolulu, HI, personal communication to C. **Mlot**, Jan. 6, 1992.
- 44. Hardin, S. et al., "Food Items of Grass Carp, American Coots, and Ring-Necked Ducks from a Central Florida Lake," Proceedings of the Annual Conference of Southeastern Associations of Fish and Wildlife Agencies, vol. 38, 1984, pp. 313-318.

- 45. Havens, C. A., Chief Operations Officer, Port Operations, Animal and Plant Health Inspection Service, U.S. Department of the Interior, personal communication to C. Mlot, Jan. 3, 1992.
- 46. Hawaii Agricultural Alliance, Aiea, HI, "Introduced Species: An Overview of Damages Caused by the Introduction of Some Alien Species to Hawaii," draft, 1991.
- 47. Hawaii Department of Agriculture, Honolulu, HI, "Annual Report," 1985.
- 48. Hawaii Department of Agriculture, Honolulu, HI, "Annual Report," 1987.
- 49, Hawaii Department of Agriculture, Honolulu, HI, "Report to the 15th Legislature, 1989 Regular Session," 1989.
- 50. Hawaii Department of Agriculture, Honolulu, HI, "Annual Report," 1990.
- 51. Hawaii Department of Land and Natural Resources, Honolulu, HI, 'Report to the Governor, vol. 1,' ' 1987-1989.
- Hinsdale, G., Assistant Western Regional Director, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, personal communication to C. Mlot, Dec. 20, 1991.
- 53. Hofstetter, RH., "The Current Status of Melaleuca quinquenervia in Southern Florida," Proceedings of the Symposium on Exotic Pest Plants, T.D. Center et al, (eds.), Tech. Rept. NPS, NREVER, NRTR-91/06 (Washington, DC: U.S. Department of the Interior, National Park Service, 1991).
- 54. Howarth, F. G., Sohmer, S. H., and Duckworth, W. D., 'Hawaiian Natural History and Conservation Efforts," *Bioscience*, vol. 38, No. 4, April 1988, pp. 232-237.
- 55. Howarth, F.G. and Ramsay, G, W., "The Conservation of Island Insects and their Habitats," The Conservation of Insects and their Habitats, N.M. Collins and J.A. Thomas (eds.) (London, England: Harcourt Brace Jovanovich/Academic Press, 1991), pp. 71-107.
- 56. Hurley, T., "Inmate Labor Worries Kula Residence," *Maui News*, Oct. 10, 1990, p, A3.
- Johnson, F.A. and Montalbano, F., III, "Selection of Plant Communities by Wintering Waterfowl on Lake Okeechobee, Florida," *Journal of Wildlife Management*, vol. 48, 1984, pp. 174-178.

- 58. Joyce, J. C., "History of Aquatic Plant Management in Florida, "Aquatic Pest Control Application Training Manual, K.A. Langeland (cd.) (Gainesville, FL: Institute of Food and Agricultural Sciences, University of Florida, 1990).
- Kushlan, J. A., "Exotic Fishes in the Everglades, A Reconsideration of Proven Impact," *Environmental Conservation*, vol. 13, 1986, pp. 67-69.
- Kushlan, J. A., "External Threats and Internal Management: The Hydrologic Regulation of the Everglades, Florida, USA," *Environmental Management*, vol. 11, No. 1, 1987, pp. 109-119.
- 61. Lamoureux, C., Botanist, University of Hawaii, Honolulu, HI, personal communication to K. Desmond, Oct. 17, 1990.
- Langeland, K. A., "Exotic Woody Plant Control," Circular No. 868 (Gainesville, FL: Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, 1990).
- 63. Langeland, K. A., "Hydrilla, A Continuing Problem in Florida Waters," Circular No. 884, (Gainesville, FL: Center for Aquatic Plants, Institute of Food and Agricultural Sciences, University of Florida, 1990).
- 64. Long, J. L., Introduced Birds of the World (Sydney: A.H. and A.W. Reed, 1981) cited in L.L. Loope and D. Mueller-Dombois, "Characteristics of Invaded Islands, With Special Reference to Hawaii," Biological Invasions: A Global Perspective, J.A. Drake et al. (eds.) (Chichester, England: John Wiley and Sons, 1989), pp. 257-280.
- 65. Loope, L. L., "Haleakala National Park and the 'Island Syndrome': Active Management is Needed for Preservation of Island Biota," *Proceedings of Conference on Science in National Parks*, (vol. 5): Management of Exotic Species in Natural Communities, L.K. Thomas (cd.) (Hancock, MI: George Wright Society/U.S. National Park Service, 1986).
- Loope, L. L., Research Scientist, Haleakala National Park, Makawao, HI, personal communication to P.T. Jenkins, Office of Technology Assessment, Aug. 21-22, 1991.
- 67. Loope, L. L., Research Scientist, Haleakala National Park, Makawao, HI, personal communica-

- tion to P.N. Windle, Office of Technology Assessment, Feb. 10, 1992.
- Loope, L.L. and Gon, S.M., III, "Biological Diversity and Its Loss," *Conservation Biology in Hawaii*, C.P. Stone and D.B. Stone (eds.) (Honolulu, HI: University of Hawaii Press, 1989).
- 69. Loope, L. L., Hamann, O., and Stone, C. P., "Comparative Conservation Biology of Oceanic Archipelagoes," *Bioscience*, vol. 38, No. 4, April 1988, pp. 272-282.
- Loope, L.L. and Mueller-Dombois, D., "Characteristics of Invaded Islands, with Special Reference to Hawaii," *Biological Invasions: A Global Perspective*, J.A. Drake et al. (eds.) (Chichester, England: John Wiley and Sons, 1989), pp. 257-280.
- 71. Maciolek, J. A., "Exotic Fishes in Hawaii and Other Islands of Oceania," *Distribution, Biology, and Management of Exotic Fishes*, W.R. Courtenay, Jr. and J.R. Stauffer, Jr. (eds.) (Baltimore, MD: Johns Hopkins University Press, 1984).
- 72. Maehr, D.S. and Holler, N.R., "Exotic Terrestrial Wildlife in Florida," unpublished manuscript, 1984.
- 73. McClelland, M., "Invasion of the **Bio**-Snatchers,' *Florida Environments*, vol. 6, No. 2, February 1992, pp. 5, 13.
- 74. Melaleuca Task Force, "Melaleuca Management Plan for South Florida, Recommendations from the Melaleuca Task Force," West Palm Beach, FL, April, 1990.
- 75. Millsap, B., Chief, Florida Bureau of Nongame Wildlife, Tallahassee, FL, personal communication to D.W. Johnston, Jan. 7, 1993.
- 76. Milon, J.W. and Welsh, R., "An Economic Analysis of Sport Fishing and the Effects of Hydrilla Management in Lake County, Florida," Economics Report No. 118, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL, 1989.
- 77. Mooney, H.A. and Drake, J. A., "The Ecology of Biological Invasions," *Environment*, vol. 29, No. 5, June 1987, p. 12.
- 78. Morgan, J., "Tourism," *Conservation Biology in Hawaii*, C.P. Stone and D.B. Stone (eds.)

- (Honolulu, HI: University of Hawaii Press, 1989), pp. 146-153,
- Morton, J. F., "Pestiferous Spread of Many ornamental and Fruit Species in South Florida," Proceedings of the Florida State Horticultural Society, vol. 89, 1976, pp. 348-353.
- Moulton, M.P. and Pimm, S. L., "Species Introductions to Hawaii," Ecology of Biological Invasions of North America and Hawaii, H.A. Mooney and J.A. Drake (eds.) (New York, NY: Springer-Verlag, 1986), pp. 231-249.
- 81. Myers, R.L. and Ewel, J.J. (eds.), *Ecosystems of Florida* (Orlando, FL: University of Central Florida Press, 1990).
- 82. Nakahara, L., Plant Quarantine Manager, Hawaii Department of Agriculture, Honolulu, HI, personal communication to C. Mlot, Apr. 16, 1992.
- 83. National Audubon Society, Report of the Advisory Panel on the Everglades and EnAngered Species, Audubon Conservation Report No. 8. (New York, NY: National Audubon Society, 1992).
- 84. National Research Council, *Decline of the Sea Turtles* (Washington, DC: National Academy Press, 1990).
- 85. Natural Resources Defense Council, "Extinction in Paradise: Protecting our Hawaiian Species," Honolulu, HI, April 1989.
- 86. Nature Conservancy of Hawaii and the Natural Resources Defense Council, "The Alien Pest Species Invasion in Hawaii: Background Study and Recommendations for Interagency Planning," July 1992.
- 87. Nordlie, F. G., "Rivers and Springs," *Ecosystems of Florida*, R.L. Myers and J.J. Ewel (eds.) (Orlando, FL: University of Central Florida Press, 1990).
- 88. Olson, S.L. and James, H. F., "Fossil Birds From the Hawaiian Islands: Evidence for Wholesale Extinction by Man Before Western Contact," *Science*, vol. 217, No. 4560, Aug. 13, 1982, pp. 633-635.
- 89. O'Meara, G.F. et al., "Invasion of Cemeteries in Florida by *Aedes albopictus*," *Journal of the American Mosquito Control Association*, vol. 8, No. 1, March 1992, pp. 1-10.

- 90. Ota, A. K., Entomologist, Hawaiian Sugar Planters' Association, Aiea, HI, letter to W. Metcalf, Hawaii State Capitol, Apr. 5, 1990.
- 91. Ota, A. K., Entomologist, Hawaiian Sugar Planters' Association, Aiea, HI, personal communication to K. Desmond, Oct. 16, 1990.
- 92. Owre, O.T., "A Consideration of the Exotic Avifauna of Southeastern Florida," *Wilson Bulletin*, vol. 85, 1973, pp. 491-500.
- 93. Peterson, S. D., Chairperson, Hawaii Board of Agriculture, Honolulu, HI, testimony at hearings before the U.S. Senate Committee on Governmental Affairs, Subcommittees on Postal Operation and Services and Postal Personnel and Modernization, Nov. 4, 1987.
- 94. Reynolds, J, R., Regional Director, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Sacramento, CA, memo to B.G.Lee on the results of the first 90 days of the Hawaii First Class Mail Pilot Project, Sept. 19, 1990.
- 95. Robertson, W. B., Jr, and Woolfenden, G. E., Florida Bird Species: An Annotated List, Special Publication No. 6 (Gainesville, FL: Florida Ornithological Society, 1992).
- 96. Sailer, R. I., "History of Insect Introductions," Exotic Plant Pests and North American Agriculture, C.L. Wilson and C.L. Graham (eds.) (New York, NY: Academic Press, Inc., 1983).
- 97. Schardt, J.D. and Schmitz, D. C., "1990 Florida Aquatic Plant Survey," Technical Report #91-CGA (Tallahassee, FL: Florida Department of Natural Resources, Bureau of Aquatic Plants, 1990)
- 98. Schmitz, D., Schardt, J. D., and Craft, J. J., "Seeds of Destruction," *Florida Environments*, vol. 4, No. 12, December 1990, p. 9.
- 99. Schoulties, C.L. et al., "A New Outbreak of Citrus Canker in Florida," *Plant Disease*, vol. 69, No. 4, April 1985, p. 361.
- 100. Schoulties, C.L. et al., "Citrus Canker in Florida," *Plant Disease*, vol. 71, No. 5, May 1987, pp. 388-395.
- 101. Shafland, P. L., "Study X1X. Peacock Bass Investigations," unpublished report, Florida Game and Fresh Water Fish Commission, Tallahassee, FL, 1990.

- 102. Shafland, P. L., Management of Introduced Freshwater Fishes in Florida, "Proceedings of the 1990 Invitational Symposium/Workshop: New Directions in Research, Management and Conservation of Hawaiian Stream Ecosystems (Honolulu, HI: Hawaii Department of Natural Resources, Division of Aquatic Resources, in press).
- 103. Shafland, P.L. and Pestrak, J. M., "Lower Lethal Temperatures for Fourteen Non-native Fishes in Florida," *Environmental Biology of Fish*, vol. 7, No. 2, February 1982, pp. 149-156.
- 104. Sharp, D. U., Doren, R. F., and Anderson, J. N., "East Everglades Exotic Plant Control, Annual Report," South Everglades Research Center, Homestead, FL, 1991.
- 105. Shelton, M. L., "Surface-Water Flow to Everglades National Park," *Geographical Review*, vol. 80, No. 4, October 1990, pp. 356-369.
- 106. Shiroma, E., Officer in Charge, Honolulu International Airport, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, personal communication to K. Desmond, Oct. 15, 1990.
- 107. Shiroma, E., Officer in Charge, Honolulu International Airport, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, personal communication to C. Mlot, Jan. 6, 1992.
- 108, Smith, C. W., "Weed Management in Hawaii's National Parks," *Monogr. Syst. Bet. Missouri Botanical Gardens*, vol. 32, 1990, pp. 223-234.
- 109. Smith, C. W., "The Alien Plant Problem in Hawaii," Proceedings of the Symposium on Exotic Pest Plants, Technical Report NPS/ NREVER/NRTR-91/06 (Washington, DC: U.S. Department of the Interior/National Park Service, 1991), pp. 327-337.
- Smith, C. W., Botany Department, University of Hawaii at Manoa, Honolulu, HI, personal communication to C. Mlot, Oct. 21, 1991.
- 111. Stange, L. A., Taxonomic Entomologist, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville, FL, personal communication to D.W. Johnston, June 1992.
- 112. Stone, C. P., "Alien Animals in Hawaii's Native Ecosystems: Toward Controlling the Adverse

- Effects of Introduced Vertebrates, 'Hawaii's Terrestrial Ecosystems: Presentation and Management (Honolulu, HI: Cooperative National Park Resources Study Unit, University of Hawaii at Manoa, 1985), pp. 251-288.
- 113. Stone, C. P., Research Scientist, Hawaii Volcanoes National Park, "Environmental Education in Hawaii," paper presented at workshop on Critical Resource Issues in the Pacific, Guam, April 1990.
- 114. Stone, C.P. and HoIt, R. A., "Managing the Invasions of Alien Ungulates and Plants in Hawaii's Natural Areas," Monogr. Syst. Bet. Missouri Botanical Gardens, vol. 32, 1990, pp. 211-221.
- 115, Sutton, D.L. and Vandiver, V. V., Jr., "Grass Carp, a Fish for Biological Management of Hydrilla and Other Aquatic Weeds in Florida," Florida Agricultural Experiment Stations. Bulletin No. 867 (Gainesville, FL: Institute of Food and Agricultural Sciences, University of Florida, 1986).
- 116, Sykes, P. W., "The Feeding Habits of the Snail Kite in Florida, USA," *Colonial Waterbirds*, vol. 10, 1987, pp. 84-92.
- 117. Thayer, D., Director, Aquatic Plant Management Division, South Florida Water Management District, West Palm Beach, FL, personal communication to D.W. Johnston, May 27, 1992.
- 118, Thompson, D. R., Operations Officer, Plant Protection and Quarantine, Animal Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville, MD, personal communication to D.W. Johnston, May 27, 1992.
- 119. Tiner, R. W., Jr., Wetlands of the United States: Current Status and Recent Trends (Washington, DC: U.S. Government Printing Office, 1984).
- Tobin, R. J., The Expendable Future: U.S. Politics and the Protection of Biological Diversity
 (Durham, NC: Duke University Press, 1990), pp.
 216-219.
- 121. Toland, B., "Use of Forested Spoil Islands by Nesting American Oystercatchers in Southeast Florida, ' *Journal of Field Ornithology*, vol. 63, *No.* 2, spring 1992. pp. 155-58.
- 122. Toops, C. and Dilley, W. E., *Birds of South Florida: An Interpretive Guide* (Conway, AR: River Road Press, 1986).

- 123. U.S. Congress, House Committee on Science, Space, and Technology, Subcommittee on Natural Resources, Agriculture Research and Environment, Hearings on H.R. 126&The National Biological Diversity Conservation and Environmental Research Act, No. 30, May 17, 1989, pp. 259-334.
- 124. U.S. Congress, Senate Committee on Governmental Affairs, Subcommittee on Federal Services, Post Office, and Civil Service, Hearings on Postal Implementation of the Agricultural Quarantine Enforcement Act, June 5, 1991.
- 125. U.S. Department of Agriculture, Agricultural Research Service, Tropical Fruit and Vegetable Research Laboratory, "I. ARS Perspective for Fruit Fly Eradication in Hawaii and Pilot Test Requirements for Demonstration of Technology," and 'II. Pilot Test to Eliminate Mediterranean Fruit Fly from the Islands of Kauai and Niihau: Detailed Work Plan," drafts (Honolulu, HI: December 1989).
- 126. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Animal Damage Control, Honolulu, HI, "Annual Report," FY 1989.
- 127. U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States:* 1990 (1 10th cd.) (Washington, DC: U.S. Government Printing Office, 1990).
- 128. Vitousek, P. M., Loope, L. L., and Stone, C. P., "Introduced Species in Hawaii: Biological Effects and Opportunities for Ecological Research," *Trends in Ecology and Evolution*, vol. 2, No. 7, July 1987, pp. 224-227.
- 129. Wagner, W. L., Herbst, D. R., and Sohmer, S. H., Manual of the Flowering Plants of Hawaii (Honolulu, HI: University of Hawaii Press, Bishop Museum Press, 1990),
- 130. Ward, D. B., "How Many Plant Species Are Native to Florida?" *Palmetto*, winter, 1989-90, pp. 3-5.
- 131. Warner, R. E., "The Role of Introduced Diseases in the Extinction of the Endemic Hawaiian Avifauna," *The Condor*, vol. 70, No. 2, spring, 1968, pp. 101-120,
- 132. Webb, J., "Managing Nature in the Everglades," *EPA Journal*, vol. 16, No. 6 November/December 1990, pp. 48-50.

- 133. Wester, L., "Origin and Distribution of Adventive Alien Flowering Plants in Hawaii, 'Alien Plant Invasions in Native Ecosystems of Hawaii: Management and Research, C.P. Stone et al. (eds.) (Honolulu, HI: University of Hawaii Press, in press), pp. 99-114.
- 134. Wiley, M. J., **Tazek**, P. P., and Sobaski, S.T., "Controlling Aquatic Vegetation With Triploid Grass Carp," *Illinois Natural History Survey*, Circular No. 57, 1987, pp. 1-16.
- 135. Williams, R.N., "Bulbul Introductions on Oahu," *Elepaio*, vol. 43, No. 11, May 1983.
- 136. Wilson, L.D. and Porras, L., The Ecological Impact of Man on the South Florida Herpetofauna, Special Publ. No. 9 (Lawrence, KS: University of Kansas, Museum of Natural History, 1983).
- 137. Winsberg, M.D., *Florida Weather* (Orlando, FL: University of Central Florida Press, 1990).
- 138. Yee, R.S.N. and Gagné, W. C., "Activities and Needs of the Horticulture Industry in Relation to Alien Plant Problems in Hawaii," *Alien P/ant Invasions in Native Ecosystems of Hawaii: Management and Research*, C.P. Stone et al. (eds.) (Honolulu, HI: University of Hawaii Press, in press), pp. 712-725.

CHAPTER 9: GENETICALLY ENGINEERED ORGANISMS AS A SPECIAL CASE

- **1. Arntzen**, C. **J.**, "Regulation of Transgenic Plants," *Science*, vol. 257, No. 5075, Sept. 4, 1992, p. 1327.
- Berry, D.F. and Hagedorn, C., "Soil and Ground-water Transport of Microorganisms, Assessing Ecological Risks of Biotechnology, L.R. Ginzburg (cd.) (Boston, MA: Butterworth-Heinemann, 1991), pp. 57-74.
- 3. Eisner, R., "State Legislators Seek to Broaden Regulation of Biotech Products," *The Scientist*, vol. 5, No. 4, Feb. 18, 1991, pp. 1, 6, 19.
- Ellstrand, N.C. and Hoffman, C. A., "Hybridization as an Avenue of Escape for Engineered Genes: Strategies for Risk Reduction," *BioScience*, vol. 40, No. 6, June 1990, pp. 438-442.
- Fuchs, R.L. and Serdy, F. S., "Genetically Modified Plants: Evaluation of Field Test Biosafety
 Data," International Symposium on the Biosafety Results of Field Tests of Genetically

- Modified Plants and Microorganisms, D.R. MacKenzie and S.C. Henry (eds.) (Bethesda, MD: Agricultural Research Institute, 1990), pp. 25-30.
- Giamporcaro, D. E., Section Chief, TSCA Biotechnology Program, U.S. Environmental Protection Agency, Washington, DC, personal communication to P.N. Windle, Office of Technology Assessment, Apr. 29, 1993.
- Goldburg, R. J., Senior Scientist, and Hopkins, D. D., Senior Attorney, Environmental Defense Fund, New York, NY, memorandum to "Persons Interested in State Oversight of Intentional Releases of Genetically Engineered Organisms," Nov. 30, 1992.
- Goldburg, R. J., Senior Scientist, and Hopkins, D. D., Senior Attorney, Environmental Defense Fund, New York, NY, letter to Chief, Regulatory Analysis and Development, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Jan. 4, 1993.
- Grossman, B., Special Assistant to the Director, Hawaii Department of Health, Honolulu, HI, personal communication to E.A. Chornesky, Office of Technology Assessment, Apr. 8, 1993.
- Hails, R.S. et al., "The Invasive Potential of Transgenic and Conventional Oilseed Rape in Natural Habitats," *Bulletin of the Ecological* Society of America, vol. 73, No. 2, June 1992, p. 197.
- Hallerman, E. M., Assistant Professor, Virginia Polytechnic Institute and State University, Blacksburg, VA, letter to P.N. Windle, Office of Technology Assessment, Nov. 29, 1992.
- 12. Hallerman, E.M. and Kapuscincki, A. R., "Ecological and Regulatory Uncertainties Associated With Transgenic Fish," *Transgenic Fish*, C.L. Hew and G. Fletcher (eds.) (Singapore: World Science Publishing, 1992), pp. 209-228.
- 13. Herrett, R. A., Statement on behalf of the Association for Biotechnology Companies, Hearings before the U.S. House Committee on Agriculture, Subcommittee on Department Operations, Research and Foreign Agriculture, "Review of Statutes of the Animal and Plant Health Inspection Service," July 10, 1990.
- 14. Hess, C. E., "Opening Remarks," *International Symposium on the Biosafety Results of Field*

- Tests of Genetically Modified Plants and Microorganisms, D.R. MacKenzie and S.C. Henry (eds.) (Bethesda, MD: Agricultural Research Institute, 1990), pp. 25-30.
- Industrial Biotechnology Association, "Year-End Survey of State Government Legislation on Biotechnology: 1991," Washington, DC, 1991.
- 16. Istock, C, A., "Genetic Exchange and Genetic Stability in Bacterial Populations," Assessing Ecological Risks of Biotechnology, L.R. Ginzburg (cd.) (Boston, MA: Butterworth-Heinemann, 1991), pp. 123-150.
- Kludy, D., Consultant, Richmond, VA, personal communication to E.A. Chornesky, Office of Technology Assessment, May 20, 1993.
- Krimsky, S. and Wetzler, R., "Bioengineered Organisms and Non-Indigenous Species," contractor report prepared for the Office of Technology Assessment, November 1991.
- Maclean, N. and Penman, D., "The Application of Gene Manipulation to Aquiculture," *Aquaculture*, vol. 85, 1990, pp. 1-20.
- 20. Medley, T. L., Director, Biotechnology, Biologics, and Environmental Protection, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville, MD, letter to W.S. Wallace, Director of Policy and Program Development, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville, MD, Feb. 11, 1992.
- 21. Mel, J.N.M. et al., "Manipulation of Floral Pigmentation Genes in Petuna: "Sense and Antisense Make Sense," *Horticultural Biotech*nology, A.B. Bennett and S.D. O'Neill (eds.) (New York, NY: John Wiley & Sons, Inc., 1990), p. 192.
- 22. Muench, S.R., "Requirements and Considerations in Successful Field Releases of Genetically Engineered Plants," *International Symposium on the Biosafety Results of Field Tests of Genetically Modified Plants and Microorganisms*, D.R. MacKenzie and S.C. Henry (eds.) (Bethesda, MD: Agricultural Research Institute, 1990), pp. 3-8.
- National Research Council, Field Testing Genetically Modified Organisms: Framework for Decisions (Washington, DC: National Academy Press, 1989),

- National Wildlife Federation, Biotechnology Policy Center, "Reports to Animal and Plant Health Inpsection Service, U.S. Department of Agriculture, on Completed Field Tests of Transgenic Plants," information sheet, Washington, DC, August 1992.
- Office of Science and Technology Policy, Executive Office of the President, Washington, DC, "Coordinated Framework for Regulation of Biotechnology," 51 Federal Register 23302-23308 (June 26, 1986).
- 26. Payne, J. H., Associate Director, Biotechnology, Biologics, and Environmental Protection, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville, MD, letter to P.N. Windle, Office of Technology Assessment, Nov. 10, 1992.
- Postgate, J., "The Malleable Microbe," New *Scientist*, vol. 129, No. 1756, Feb. 16, 1991, pp. 38-41.
- President's Council on Competitiveness, "Report on National Biotechnology Policy," Washington, DC, February 1991.
- Regal, P. J., presentation on environmental issues, Transgenic Plant Conference, Annapolis, MD, Sept. 7-9,1988, co-sponsored by U.S. Food and Drug Administration, U.S. Environmental Protection Agency, and the U.S. Department of Agriculture, 1988.
- 30. Rogul, M. and Levin, M., "Regulation of Biotechnology by the Environmental Protection Agency," *Assessing Ecological Risks of Biotechnology*, L.R. Ginzburg (cd.) (Boston, MA: Butterworth-Heinemann, 1991), pp. 233-265.
- 31. Sagoff, M., 'On Making Nature Safe for Biotechnology,' Assessing Ecological Risks of Biotechnology, L.R. Ginzburg (cd.) (Boston, MA: Butterworth-Heinemann, 1991), pp. 341-365.
- 32. Sharples, F.E., "Applications of Introduced Species Models to Biotechnology Assessment," *Application of Biotechnology to Environmental and Policy Issues*, J.R. Fowle III (cd.) (Boulder, CO: Westview Press, Inc., 1987), pp. 93-98.
- Shore, S., Biotechnologist, Division of Plant Industry, North Carolina Department of Agriculture, Raleigh, NC, personal communication to E.A. Chornesky, Office of Technology Assessment, May 25, 1993.

- 34. Slutsky, B., "Pesticidal Transgenic Plants: Risk Issue s," *Pesticidal Transgenic Plants: Product Development, Risk Assessment, and Data Needs*, U.S. EPA Conference Proceedings (EPwIT-1024), Annapolis, MD, Nov. 6 and 7, 1990, pp. 127-132.
- 35. Springer, W. D., testimony before the U.S. House Committee on Agriculture, Subcommittee on Department Operations, Research, and Foreign Agriculture, Adequacy of Current Biotechnology Regulation and the Omnibus Biotechnology Act of 1990 (HR 5312), Serial No. 101-75, Oct. 2, 1990
- 36. Suter, G. W., "Exotic Organisms," *Ecological Risk Assessment*, G.W.Suter (cd.) (Boca Raton, FL: Lewis Publishers, 1993), pp. 391401.
- Tiedje, J.M. et al., "The Planned Introduction of Genetically Engineered Organisms: Ecological Considerations and Recommendations," *Ecology*, vol. 70, No. 2, 1989, pp. 298-315.
- U.S. Congress, General Accounting Office, Biotechnology: Role of Institutional Biosafety Committees, GAO/RCED-88-64BR (Washington, DC: U.S. Government Printing Office, December 1987).
- 39. U.S. Congress, General Accounting Office, *Biotechnology: Delays in and Status of EPA's Efforts to issue a TSCA Regulation*, GAO/RCED-92-167, Washington, DC, June 1992.
- 40. U.S. Congress, House Committee on Agriculture, Subcommittee on Department Operations, Research, and Foreign Agriculture, *Review of Current and Proposed Agriculture Biotechnology Regulatory Authority and the Omnibus Biotechnology Act of 1990*, Serial No. 101-75 (Washington, DC: U.S. Government Printing Office, 1991),
- U.S. Congress, House Committee on Merchant Marines and Fisheries, request letter to J.H. Gibbons Director, Office of Technology Assessment, July 24, 1990.
- 42. U.S. Congress, House Committee on Science and Technology, Subcommittee on Investigations and Oversight, *Issues* in the Federal Regulation of Biotechnology: From Research to Release (Washington, DC: U.S. Government Printing Office, December 1986).

- 43. U.S. Congress, Office of Technology Assessment, A New Technological Era for American Agriculture, OTA-F-474 (Washington, DC: U.S. Government Printing Office, August 1992).
- 44. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Biotechnology, Biologics, and Environmental Protection, "User's Guide for Introducing Genetically Engineered Plants and Microorganisms," technical bulletin No. 1783, Hyattsville, MD, June 1991.
- 45. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Biotechnology, Biologics, and Environmental Protection, Conference Report of the Workshop on Safeguards for Planned Introduction of Transgenic Potatoes, St. Andrews, Scotland, Aug. 16-17, 1991, J.P. Hegelson and H.V. Davis (eds.), Hyattsville, MD, 1991.
- 46. U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Biotechnology, Biologics, and Environmental Protection, Conference Report on Workshop on Safeguards for Planned Introduction of Transgenic Corn and Wheat, Keystone, CO, Dec. 6-8, 1990, L.V. Giddings et al. (eds.), April 1992.
- 47, U.S. Department of Agriculture, Office of Agricultural Biotechnology, "Proposed USDA Guidelines for Research Involving the Planned Introduction Into the Environment of Organisms With Deliberately Modified Hereditary Traits," 56 Federal Register 4134-4151 (Feb. 1, 1991).
- 48. Vaituzis, Z., "Product Characterization and Toxicological Evaluation of Pesticidal Transgenic Plants," Pesticidal Transgenic Plants: Product Development, Risk Assessment, and Data Needs, Proceedings of the U.S. EPA Conference (EPA/21 T-1024), Annapolis, MD, Nov. 6 and 7,1990, pp. 135-140.
- 49. Wrubel, R, P., Krimsky, S., and Wetzler, R. E., "Field Testing Transgenic Plants: An Analysis of the U.S. Department of Agriculture's Environmental Assessments," Bioscience, vol. 42, No. 4, April 1992, pp. 280-289.

CHAPTER 10: THE CONTEXT OF THE FUTURE: INTERNATIONAL LAW AND GLOBAL CHANGE

- 1. Anonymous, "Extremely Rare Fruit Worm Blocks Apple Export," *Seattle Times, Nov. 30, 1991*, p. Al 1.
- 2. Anonymous, "Floral Arrangement," *Journal of Commerce*, June 27, 1991, p. A3.
- 3. Anonymous, "Pest Infestation Spurs Doubt Over Standards in Mexico," *Christian Science Monitor*, May 4, 1992, p. 19.
- Anonymous, "Potatoes at the Root of Another U.S.-Canada Trade Embroilment, " *Journal of Commerce*, Feb. 19, 1991, p. A7.
- Asselin, P., Assistant Deputy Minister, Fisheries and Oceans Department, Government of Canada, internal memorandum to Associate Deputy Minister, Policy and Program Planning, July 31, 1987.
- Bangsund, D. A., and Leistritz, F. L., Economic Impact of Leafy Spurge in Montana, South Dakota, and Wyoming, Agricultural Economics Report No. 275 (Fargo, ND: Department of Agricultural Economics, North Dakota State University, October 1991).
- Birmingham, M. J., "The State of Forest Health in New York," New York State Department of Environmental Conservation, Division of Lands and Forests, Albany, NY, Dec. 31, 1990.
- 8. Breckenridge, R.P. and Otis, M. D., "Monitoring Concepts Useful in the Assessment of Climate Change Effects on U.S. Fish and Wildlife Resources," *Coping With Climate Change, J.C.* Topping (cd.) (Washington, DC: The Climate Inst., 1989), pp. 268-272.
- Britton, J. C., "Pathways and Consequences of the Introduction of Non-indigenous Freshwater, Terrestrial, and Estuarine Mollusks in the United States,' contractor report prepared for the Office of Technology Assessment, Washington, DC, October 1991.
- Brooks, D. J., "International Dimensions of U.S. Forestry," Agriculture Outlook '93, Prospects for Fruit and Vegetables, Floriculture and Forest Products, booklet 2, U.S. Department of Agriculture, Washington, DC, Dec. 12, 1992, pp. 19-33.
- 11 Campbell, D. S., Director, Operational Support, International Services, Animal and Plant Health Inspection Service, U.S. Department of Agricul-

- ture, letter to Phyllis N. Windle, OTA, Aug. 21, 1992.
- Campbell, F.T., Natural Resources Defense Council, "Legal Avenues for Controlling Exotics," presentation at Indiana Academy of Science Conference on Biological Pollution, Indianapoh, IN, Oct. 26, 1991.
- 13. Carlton, J.T., 'Man's Role in Changing the Face of the Ocean,' *Conservation Biology*, vol. 3, No. 3, September 1989, pp. 270-72.
- 14. Chi, **K.S.** "Foresight Activities in State Governmerit," *Futures Research Quarterly*, vol. 7, No. 4, 1991, pp. 47-60.
- Chock, A. K., "International Cooperation on Controlling Exotic Pests," Exotic P/ant Pests and North American Agriculture, C.L. Wilson and C.L. Graham (eds.) (London, England: Academic Press, 1983), pp. 479-498.
- 16. Coates, J. F., "Factors Shaping and Shaped by the Environment, 1990-2010," *Futures Research Quarterly, vol. 7, No. 3,* fall 1991, pp. 5-55.
- 17. Coates, J. F., President, Coates & Jarratt, Inc., Washington, DC, personal communication to Office of Technology Assessment, Dec. 21, 1992.
- 18. Coates, J.F. and Jarratt, J., "What Futurists Believe," *Futures*, vol. **24**, **No. 6**, November-December 1990, pp. 22-28.
- Courtenay, W. R., Jr., "Pathways and Consequences of the Introduction of Non-Indigenous Fishes in the United States," contractor report prepared for the Office of Technology Assessment, September 1991.
- 20. Cramer, J. and Zegveld, W. C. L., "The Future Role of Technology in Environmental Management," *Futures*, vol. 23, No. 5, June 1991, pp. 451-468.
- Crawley, M. J., "The Responses of Terrestrial Ecosystems to Global Climate Change," *Global* Climate and Ecosystem Change, G. MacDonald and L. Sertorio (eds.) (New York, NY: Plenum Press, 1990).
- 22. Crosson, P., "United States Agriculture and the Environment: Perspectives on the Next Twenty Years," Resources for the Future, Washington, DC, April 1992.
- 23. Dahlsten, D. L., Garcia, R. and Lorraine, H., "Eradication as a Pest Management Tool: Con-

- cepts and Contexts, " Eradication of Exotic Pests: Analysis with Case Histories, D.L. Dahlsten and R. Garcia (eds.) (Dexter, MI: Thompson-Shore, Inc., 1989), pp. 3-15.
- 24. Davis, M.B. and Zabinski, C., "Changes in Geographical Range Resulting from Greenhouse w arming: Effects on Biodiversity in Forests," Global Warming and Biological Diversity, P.L. Peters and T.E. Lovejoy (eds.) (New Haven, CN: Yale University Press, 1992), pp. 297-308.
- Delfosse, E. S., Director, National Biological Control Institute, Animal and Plant Health Inspection Service, U.S. Department of Agriculture, Hyattsville, MD, personal communication to Office of Technology Assessment, Nov. 19, 1991.
- 26. Di Castri, F., "On Invading Species and Invaded Ecosystems: The Interplay of Historical Chance and Biological Necessity," *Biological Invasions* in Europe and the Mediterranean Basin, F. di Castri, A.J. Hansen, and M. Debussche (eds.) (Boston, MA: Kluwer Academic Publishers, 1990), pp. 3-16.
- 27. Dobb, E., "Cultivating Nature," *The Sciences*, vol. 32, No. 1, January/February 1992, pp. 44-50.
- Dobson, A., "Climate Change and Parasitic Diseases of Man and Domestic Livestock in the United States," *Coping With Climate Change*, J.C. Topping (cd.) (Washington, DC: The Climate Inst., 1989), pp. 147-152.
- 29, Duvick, D, N., "Plant Breeding in the 21st Century," *Choices*, vol. 7, fourth quarter 1992, pp. 26-29.
- Ehler, L., Professor, Department of Entomology, University of California, Berkeley, CA, personal communication to Office of Technology Assessment, Dec. 23, 1992.
- Elston, R. A., 'Effective Applications of Aquaculture Disease-Control Regulations: Recommendations From an Industry Viewpoint, *Dispersal of Living Organisms into Aquatic Ecosystems*, A. Rosenfield and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 353-359.
- 32. Ehon, C. S., *The Ecology of Invasions by Animals and Plants* (London, England: Chapman and Hall, Ltd., 1958).

- 33. Fetterolf, C. M., "Why a Great Lakes Fisheries Commission and Why a Sea Lamprey International Symposium," *Canadian Journal of Fisheries and Aquatic Sciences*, vol. 37, 1980, pp. 1588-1593.
- Fletcher, S.R. and Tiemann, M. E., "Trade and the Environment," *CRS Review*, Congressional Research Service, Washington, DC, February-March, 1992, pp. 29-31,
- 35. Forcella, F., "Final Distribution Is Related to Rate of Spread in Alien Weeds," *Weed Research*, vol. 25, 1985, pp. 181-191.
- 36. Fox, M. D., "Mediterranean Weeds: Exchanges of Invasive Plants Between the Five Mediterranean Regions of the World, "Biological Invasions in Europe and the Mediterranean Basin, F. di Castri, A.J. Hansen, and M. Debussche (eds.) (Dordrecht: Kluwer Academic Publishers, 1990), pp. 179-200.
- 37. Gasser, C.S. and Fraley, R.T., "Genetically Engineering Plants for Crop Improvement," *Science*, vol. 244, No, 4910, June 16, 1989, pp. 1293-1299.
- 38. Great Lakes Fisheries Commission, Ann Arbor, Michigan, "A Joint Strategic Plan for Management of Great Lake Fisheries, 'December 1980.
- 39. Great Lakes Water Quality Agreement of 1978 (revised), as amended by Protocol signed Nov. 18,1987, International Joint Commission (Washington, DC and Ottawa, Canada: January 1988).
- 40. Grooms, L., "Marketers Address Today's Flower Trends," *Seed World*, vol. 130, No. 1, January 1992, pp. 19-22.
- 41. Hanrahan, C. E., 'Agriculture in the North American Free Trade Agreement: A Preliminary Assessmerit,' CRS Report for Congress, 92-716 S, Congressional Research Service, Library of Congress, Washington, DC, Sept. 21, 1992.
- 42. Harville, J.P. (cd,), *Proceedings of the North American Fisheries Leadership Workshop*, Snowbird, UT, May 21-23 (Bethesda, MD: American Fisheries Society, Fisheries Administrators Section, 1991).
- 43. Houghton, J.T., Jenkins, G. J., Ephraums, J.J. (eds.), Climate Change-The Intergovernmental Panel on Climate Change Scientific Assessment, World Meteorological Organization/U.N. Envi-

- ronment Programme (Cambridge, England: Camridge Univ. Press, 1990).
- 44. International Union for the Conservation of Nature and Natural Resources, Environmental Law Centre, Bonn, Germany, "Biological Diversity Convention Draft," June 30, 1989.
- Jablonski, D., "Extinctions: A Paleontological Perspective," *Science*, vol. 253, No. 5021, Aug. 16, 1991, pp. 754-757.
- 46. Johnson, D. C., "Recession Impacts and Economic Outlook for the U.S. Nursery, Greenhouse, and Turfgrass Industries, Agriculture Outlook '93. Prospects for Fruit and Vegetables, Floriculture and Forest Products, booklet 2, U.S. Department of Agriculture, Washington, DC, 1992, pp. 3-12.
- 47. Kahn, R. P., "Exclusion as a Plant Disease Control Strategy," *Annual Review of Phytopa-thology*, vol. 29, 1991, pp. 219-246.
- 48. Kahn, R. P., Consultant, **Rockville**, MD, personal communication to the Office of Technology Assessment, Dec. 4, 1991.
- 49. Kareiva, P. M., Kingsolver, J. G., and R.B. Huey (eds.), *Biotic Interactions and Global Change* (Sunderland, MA: Sinauer Assoc., 1993).
- Kennedy, V. S., "Potential Climate Effects of Climate Change on Chesapeake Bay Animals and Fisheries," *Coping With Climate Change*, J.C. Topping (cd.) (Washington, DC: The Climate Inst., 1989), pp. 509-513.
- Kim, K.C. and Wheeler, A. G., Jr., "Pathways and Consequences of the Introduction of Non-Indigenous Insects and Arachnids in the United States,' contractor report prepared for the Office of Technology Assessment, December 1991.
- 52, Kludy, D. H., "Federal Policy on Non-Indigenous Species—The Role of the United States Department of Agriculture's Animal and Plant Health Inspection Service," contractor report prepared for the Office of Technology Assessment, December 1991,
- Lausche, B., "International Laws and Associated Programs for *In-Situ* Conservation of Wild Species,' contractor report prepared for the Office of Technology Assessment, September 1985.
- 54. Lederberg, J., Shope, R. E., and Oaks, S. C., Jr. (eds.), *Emerging Infections: Microbial Threats*

- to Health in the United States (Washington, DC: National Academy Press, 1992),
- 55. Longstreth, J. and Wiseman, J., "The Potential Impact of Climate Change on Patterns of Infectious Disease in the United States," The Potential Effects of Global Climate Change on the United States, Appendix G, Health, J.B. Smith and D. Tirpak (eds.), EPA-230-05-89-057 (Washington, DC: Office of Policy, Planning, and Evaluation, U.S. Environmental Protection Agency, May 1989), pp. 3-1—3-41.
- **56.** Lubchenco, J. et al., "The Sustainable Biosphere Initiative: An Ecological Research Agenda," *Ecology*, vol. 72, No, 2, 1991, pp. 371412.
- 57. Lyster, S., *International Wildlife Law* (Cambridge, England: Grotius Publications, 1985).
- 58. MacArthur, R. H., *Geographical Ecology (New* York, NY: Harper and Row, 1972).
- 59. Macdonald, I. A. W., Loope, L. L., Usher, M. B., and Hamann, O., "Wildlife Conservation and the Invasion of Nature Reserves by Introduced Species: A Global Perspective,' *Biological Invasions*, J.A. Drake et al. (eds.), Scope 37 (Chichester, UK: John Wiley & Sons, Ltd., 1989), pp. 215-255.
- 60. Mack, R. N., "Additional Information on Non-Indigenous Plants in the United States," contractor report prepared for the Office of Technology Assessment, Washington, DC, October 1992.
- 61. Magnuson, J.J. et al., "Potential Responses of Great Lakes Fishes and Their Habitat to Global Climate Warming," The Potential Effects of Gloabl Climate Change on the United States, Appendix E, Aquatic Resources, J.B. Smith and D. Tirpak (eds.), EPA-230-05-89-055 (Washington, DC: U.S. Environmental Protection Agency, June 1989), pp. 2-1—242.
- 62. Marien, M. (cd.), "A Future Survey Guide to 50 Overviews and Agenda's," *Futures Research Quarterly*, vol. 6, No. 1, spring 1990, pp. 103-112.
- 63. M'Boob, S., U.N. Food and Agriculture Organization-Africa, presentation at the North American Plant Protection Organization Workshop on International Pest Risk Analysis, Alexandria, VA, Oct. 23, 1991.
- 64. Miller, W.F, Dougherty, P.M. and Switzer, G. L., "Rising C02 and Changing Climate: Major

- Southern Forest Management Implications," *The Greenhouse Effect, Climate Change, and U.S. Forests* (Washington, DC: The Conservation Foundation, 1987).
- 65. Minnesota Interagency Exotic Species Task Force, Report and Recommendations, final edit (St. Paul, MN: State of Minnesota, Department of Natural Resources, July 1991).
- Moulton, W., "Constraints to International Exchange of Animal Germplasm," contractor report prepared for the Office of Technology Assessment, October 1985.
- 67. Munton, P., "Problems Associated With Introduced Species," paper presented at the Workshop on Feral Animals at the Third International Theriological Conference, Helsinki, Finland, August 1982.
- National Research Council, Biological Contamination of Mars: Issues and Recommendations, Space Studies Board (Washington, DC: National Academy Press, 1992).
- 69, North American Plant Protection Organization, Pest Risk Analysis Panel, 'A Process for Analyzing the Risk to Plants and Plant Products Posed by the Introduction and/or Spread of Biotic Agents," discussion paper, Nov. 22, 1991.
- Ness, R. F., "From Endangered Species to Biodiversity," *Balancing on the Brink of Extinction*, K.A. Kohm (cd.) (Washington, DC: Island Press_s 1991), pp. 227-242,
- O'Rourke, D., Director, Impact Center, Washington State University, Pullman, WA, personal communication to K.E. Bannon, Office of Technology Assessment, July 12, 1993.
- 72. Parker, N. C., "Economic Pressures Driving Genetic Changes in Fish," Introductions and Transfers of Marine and Anadromous Species," Dispersal of Living Organisms Into Aquatic Ecosystems, A. Rosenfield and R. Mann (eds.) (College Park, MD: Maryland Sea Grant, 1992), pp. 415419.
- 73. Parry, M, L., Climate Change and World Agriculture (London, England: Earthscan Publishers, 1990).
- 74. Peters, R. L., "Consequences of Global Warming for Biological Diversity, Global Climate Change and Life on Earth, R.L. Wyman (cd.)

- (New York, NY: Chapman and Hall, 1991), pp. 99-118.
- Reed, C.F. and Hughes, R. O., Economically Important Foreign Weeds, USDA Agricultural Handbook Number 498 (Washington, DC: U.S. Department of Agriculture, 1977).
- 76. Rensberger, B., "Marine Biology: Blue Crabs to the Rescue?" *The Washington Post*, Feb. 24, 1992, p. A2.
- 77. Rinderer, T.E. et al., "The Proposed Honey Bee Regulated Zone in Mexico," *American Bee Journal*, March 1987, pp. 160-164.
- 78. Ritchie, M., "GATT, Agriculture and the Environment: The U.S. Double Zero Plan, "The Ecologist, vol. 20, No, 6, November-December 1990, pp. 214-220.
- 79. Schneider, K., "Ranges of Animals and Plants Head North," *The New York Times*, Aug. 13, 1991, p. cl.
- Schneider, S. H., Mearns, L. and P.H. Gleick, "Climate-Change Scenarios for Impact Assessmerit," Global Warming and Biological Diversity, R.L. Peters and T.E. Lovejoy (eds.) (New Haven, CT: Yale University Press, 1992), pp. 38-55.
- 81. Scott, D. C., 'Mexico's Avocado Growers Grumble Over Unlikely Beachhead-Alaska,' *Christian Science Monitor, Nov. 9, 1992*, p. 6.
- 82. Shetler, S. G., "Three Faces of Eden," *Seeds of Change* Washington, DC: Smithsonian Press, 1991), pp. 227-247.
- 83. Shope, R. E., "Global Climate Change and Infectious Disease," *Environmental Health Perspectives*, vol. 96, 1991, pp. 171-174.
- 84. Shrybman, S., ''International Trade: In Search of an Environmental Conscience, ' *EPA Journal*, July-August 1990, pp. 17-19.
- 85. Simberloff, D. and Cox, J., "Consequences and Costs of Conservation Corridors," *Conservation Biology*, vol. 1, No. 1, 1987, pp. 63-71.
- 86. Soulé, M. E., "Conservation Biology in the Twenty-first Century: Summary and Outlook," Conservation for the Twenty -first Century, D. Western and M.C. Pearl (eds.) (New York, NY: Oxford Univ. Press, 1989), pp. 297-303.
- 87. Soulé, M. E., "The Onslaught of Alien Species, and Other Challenges in the Coming Decades,"

- Conservation Biology, vol. 4, No. 3, September 1990, pp. 233-239.
- 88. Soulé, M. E., "Conservation: Tactics for a Constant Crisis," *Science*, vol. 253, No. 5021, Aug. 16, 1991, pp. 744-750.
- 89. Steadman, D. W., "Extinction of Species: Past, Present, and Future," *Global Climate Change and Life on Earth*, R.L. Wyman (cd.) (New York, NY: Chapman and Hall, 1991), pp. 156-169.
- Stinner, B.R. et al., "Potential Effects of Climate Change on Plant-Pest Interactions," The Potential Effects of Global Climate Change on the United States, Appendix C, Agriculture, J.B. Smith and D. Tirpak (eds.), EPA-230-05-89-053 (Washington, DC: Office of Policy, Planning, and Evaluation, U.S. Environmental Protection Agency, June 1989), pp. 8-1—8-35,
- 91. Strobel, G. A., "Biological Control of Weeds," *Scientific American*, vol. 265, No. 1, July 1991, pp. 72-78.
- 92. Tayama, H. K., "New Developments in World Floriculture Markets," *Agriculture Outlook '93, Late Speeches (1)*, Booklet 9, U.S. Department of Agriculture, Washington, DC, Dec. 2, 1992, pp. 44-57.
- 93. Uher, R. A., "Levitating Trains," *The Futurist*, vol. 24, No. 5, September/October 1990, pp. 28-32.
- 94. United Nations, *Convention on the Law of the Sea and Resolutions I-IV*, Third United Nations Conference on the Law of the Sea, Eleventh Session, New York, March-April, 1982.
- 95. United Nations Environment Programme, 'Draft Convention on Biological Diversity," May 22, 1992, Art. 8.
- 96. U.S. Congress, General Accounting Office, *International Environ men t: International Agreements Are Not Well Monitored*, RCED-92-43 (Gaithersburg, MD: U.S. General Accounting Office, January 1992).
- U.S. Congress, Office of Technology Assessment, Changing by Degrees: Steps to Reduce Greenhouse Gases, OTA-482 (Washington, DC: U.S. Government Printing Office, February 1991).
- 98. U.S. Congress, Office of Technology Assessment, *Trade and Environment: Conflicts and Opportunities*, OTA-BP-ITE-94 (Washington,

- DC: U.S. Government Printing Office, May 1992).
- 99. U.S. Congress, Office of Technology Assessment, Preparing for an Uncertain Climate (Washington, DC: U.S. Government Printing Office, in press).
- U.S. Department of Agriculture, Agriculture Statistics 1990 (Washington, DC: U.S. Government Printing Office, 1990).
- U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services, Import-Export Program, "Program Monitoring Review" (undated).
- 102. U.S. Executive Office of the President, Office of the Press Secretary, "Statement by the President on United States Ocean Policy, Mar. 10, 1983," Washington, DC.
- 103. U.S. Executive Office of the President, *Science and Technology* (Washington, DC: **Office** of Science and Technology Policy, 1993).
- 104. U.S. Interagency Task Force, "Review of U. S.-Mexico Environmental Issues," Office of the U.S. Trade Representative, Washington, DC, February 1992, as cited in U.S. Congress, Office of Technology Assessment, *Trade and Environment: Conflicts and Opportunities*, OTA-BP-ITE-94 (Washington, DC: U.S. Government Printing Office, May 1992).
- 105. Usher, M. B., "Biological Invasions of Nature Reserves: A Search for Generalizations," *Biological Conservation*, vol. 44, Nos. 1/2, 1988, pp. 119-135,

- 106. Verrneij, G. J., "When **Biotas** Meet: Understanding Biotic Interchange," *Science*, vol. 253, No. 5024, Sept. 6, 1991, pp. 1099-1104.
- 107, Vogt, D. U., Congressional Research Service, Library of Congress, Washington, DC, memorandum entitled 'GATT Sanitary and Phytosanitary Proposals," Nov. 14, 1990.
- 108. Vogt, D. U., "Sanitary and Phytosanitary Measures Pertaining to Food in International Trade Negotiations," Congressional Research Service, Library of Congress, Washington, DC, Sept. 11, 1992.
- 109. Waldrop, J., 'Garden Variety Customers, "*Amercan Demographics*, vol. 15, No. 4, April 1993, pp. 44-49.
- 110. Warrick, R.A. et al., "The Effects of Increased C02 and Climatic Change on Terrestrial Ecosystems, The Greenhouse Effect, Climatic Change, and Ecosystems, SCOPE 29, B. Bolin et al. (eds.) (Chichester, UK: John Wiley & Sons, 1986), pp. 363-392.
- 111. **Welcomme**, R.L., "International Measures for the Control of Introduction of Aquatic Organisms," *Fisheries*, vol. 11, No. 2, May-April 1986, pp. 4-9.
- 112. Westman, W. E., "Managing for **Biodiversity—** Unresolved Science and Policy Questions," *Bioscience*, vol. 40, No. 1, January 1990, pp. 26-33.
- 113. Wyman, R.L. (cd.), Global Climate Change and Life on Earth (New York, NY: Chapman and Hall, 1991).
- 114. Ziegler, W., "Envisioning the Future," *Futures*, vol. 23, No. 5, June 1991, pp. 516-527.