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James E. Bernstein

Penny Hazelton

University of Washington School of Law

Dennis J. Hubel

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CLEARCUTTING: CAN YOU SEE THE FOREST FOR THE TREES?

BY JAMES E. BERNSTEIN*
PENNY HAZELTON†
DENNIS J. HUBEL††

The Organic Act of 1897 provided for the establishment and management of the national forest and park lands.¹ In *West Virginia Division of the Izaak Walton League v. Butz*² the United States District Court, applying the "plain meaning" of the Organic Act, permanently enjoined clearcutting on the Monongahela National Forest of West Virginia.³ The meaning of isolated words, however, is rarely determinative of Congressional intent.⁴ This article will demonstrate the shortcomings of the court's decision through an examination of the doctrines of statutory construction and analysis of the legislative history and administrative interpretation of the Act and by addressing the real issue, clearcutting as a scientific management technique.

THE CASE

The Monongahela National Forest was established in 1920, encompassing approximately 54,000 acres in the heart of the

*Student, Lewis and Clark Law School-Northwestern School of Law. B.A., University of Puget Sound, 1972.

† Student, Lewis and Clark Law School-Northwestern School of Law. B.A., Linfield College, 1969.

†† Student, Lewis and Clark Law School-Northwestern School of Law. B.S., Cornell University, 1969, formerly Nuclear Engineer, Hanford Engineering Development Laboratory of the U.S. Atomic Energy Commission, 1972-73.

1. Ch. 2, 30 Stat. 34 (codified at 16 U.S.C. § 473-75 (1970)) [hereinafter cited as the Act].

2. 367 F. Supp. 422 (N.D.W. Va. 1973) (appeal pending) [hereinafter cited as *Izaak Walton League*].

3. *Id.* at 433.

4. See, e.g., *Sheftic v. Boles*, 295 F. Supp. 1347, 1349 (N.D.W. Va. 1969), in which this court had previously held that the meaning of a statute depends upon "the entire statute, its nature, its objectives, and the consequences which would result from construing it one way or the other, and the statute must be construed in connection with other related statutes."

Allegheny Highlands of West Virginia.⁵ Today, the Monongahela includes 820,000 acres of which 784,000 acres are classified as commercial forest lands.⁶ It is estimated that from fiscal year 1968 through fiscal year 1972, approximately 754 thousand board feet (MBF) on 39,922 acres were harvested under contract. As of July 1, 1972, the total uncut volume under contract included approximately 48,000 MBF of sawtimber and 49,000 cords of hardwood on 15,000 acres.⁷

In April 1973 the United States Forest Service advertised for timber sales in the Monongahela. Three proposed sales contracts designated 428 acres as clearcutting units ranging in size from five to twenty-five acres and subjected 649 acres to selection and improvement cutting.⁸

The West Virginia Division of the Izaak Walton League, the Sierra Club and several other organizations filed suit against the Secretary of Agriculture for declaratory judgment and injunctive relief to prevent the sale. Plaintiffs contended that the Forest Service contracts were in violation of the Organic Act because trees would be sold and cut which were not dead, physiologically mature or large, and which had not been individually marked.⁹ The court granted plaintiffs' motion for summary judgment concluding that "the clear and unmistakable language" of the Act (1) limits timber

5. FOREST SERVICE, U.S. DEP'T OF AGRICULTURE, 50 YEAR HISTORY OF THE MONONGAHELA NATIONAL FOREST 8 (1970).

6. FOREST SERVICE, U.S. DEP'T OF AGRICULTURE, EVEN-AGE MANAGEMENT OF THE MONONGAHELA NATIONAL FOREST (1970).

7. 367 F. SUPP. AT 426.

8. *Id.* at 427-8.

9. Specifically, the four principal methods of timber harvest, allegedly used by defendants in violation of the Organic Act include:

1. Clearcutting, alleged to be "the method of designating the outer boundary of an area of trees" and the sale of such timber "without any marking of individual trees to be cut." Plaintiffs contended that all trees in a group were cut at one time without consideration of age or condition and that under such a plan any trees which remained standing were usually "killed by cutting a ring around the trunk of the tree, with an axe, or by poisoning."

2. Seed tree cutting alleged to be a phase of clearcutting whereby the outer boundary of a group of trees is designated "and then several trees per acre are marked as an indication that they are to remain" and all other trees are removed regardless of condition or age.

3. Shelterwood cutting, alleged to be a three phased plan for clearcutting whereby in phase one "the most mature and defective trees are selectively marked and removed;" in phase two seedtree cutting is practiced; and in the final stage seedtrees are removed.

sales to "dead, matured or large growth of trees" [sic]; (2) requires that each individual tree, as a precondition of sale, "be marked and designated;" and (3) that all sold timber "be cut and removed."¹⁰

STATUTORY CONSTRUCTION

The court relied on the plain meaning doctrine of statutory construction to enjoin the use of clearcutting in the national forest. To ascertain the meaning of the statute, however, the court should look to many things. The plain meaning of the words is only one of these.

Words are seldom so plain that their context cannot shape them. Once the "tyranny of literalness" is rejected, * * * the real meaning of seemingly plain words must be supplied by a consideration of the statute as a whole as well as by an inquiry into relevant legislative history.¹¹

Although the fundamental guide to legislative purpose is the language of the act, individual words of a section or provision must not be isolated from the whole.¹² The Supreme Court of the United States has frequently recognized the need to look beyond the words to Congressional intent, when plain meaning has led to absurd results. Often, results merely unreasonable because they vary from the legislative policy have been rejected to follow that policy.

When aid to construction of the meaning of words, as used in the statute, is available, there certainly can be no "rule of law" which forbids its use, however clear the words may appear on "superficial examination." * * * Obviously there is danger that the court's conclusion as to legislative purpose will be unconsciously influenced by the judges' own views * * * but [that] hardly justifies an acceptance of a literal interpretation dogma which withholds from the courts available information for reaching a correct conclusion. Emphasis should be laid, too, upon the necessity for appraisal of the

4. Intermediate and improvement cutting alleged to be the method whereby a stand of trees "is thinned by removing individual trees." Plaintiffs contend that under this system a tree is marked for removal regardless of condition or age.

10. 367 F. Supp. at 433.

11. *ICC v. J-T Transport Co.*, 368 U.S. 81, 107 (1961) (Frankfurter, J., dissenting opinion) (citation omitted). See, e.g., *NAACP v. Patty*, 159 F. Supp. 503, 515 n.6 (E.D. Va. 1958); *FCC v. Cohn*, 154 F. Supp. 899, 910 (S.D.N.Y. 1957); 2A C. SANDS, *STATUTES AND STATUTORY CONSTRUCTION* §48.01 *et. seq.* (4th ed. 1973).

12. *Elizabeth Arden Sales Corp. v. Gus Blass Co.*, 150 F.2d 988, 993 (8th Cir. 1945).

purposes as a whole of Congress in analyzing the meaning of clauses or sections of general acts.¹³

As Justice Holmes said, "it is not an adequate discharge of duty for courts to say: We see what you are driving at, but you had not said it, and therefore we shall go on as before."¹⁴ The court, therefore, has a duty to consider all relevant evidence in making its determination.

[I]t is one of the surest indexes of a mature and developed jurisprudence not to make a fortress out of a dictionary; but to remember that statutes always have some purpose or object to accomplish, whose sympathetic and imaginative discovery is the surest guide to their meaning.¹⁵

An examination by the court of the legislative history of the Organic Act would have aided in indentifying Congressional intent. Moreover, other statutes which deal with the subject of the Organic Act are a valuable form of extrinsic aid in interpreting and applying the statute in question.¹⁶ Subsequent legislation reflects the systematic development of national forest management and a clear pattern of Congressional action in light of the Organic Act. In addition, the long-continued contemporaneous and practical interpretation of the Organic Act by the Secretary of Agriculture constitutes an invaluable aid, especially in light of Congressional acquiescence to that interpretation.¹⁷ "In the construction of a doubtful and ambiguous law, the cotemporaneous construction of those who were called upon to act under the law, and were appointed to carry its provisions into effect, is entitled to very great respect."¹⁸

13. *United States v. American Trucking Ass'ns, Inc.*, 310 U.S. 534, 543-44 (1939) (footnotes omitted). The Court cited the following authorities in support of this statement: *Maurer v. Hamilton*, 309 U.S. 598, 612, 615 (1940); *Armstrong Co. v. Nu-Enamel Corp.*, 305 U.S. 315, 332 (1938); *Helvering v. New York Trust Co.*, 292 U.S. 455, 465 (1934); *Helvering v. Morgan's, Inc.*, 293 U.S. 121, 126 (1934); *Williams v. United States*, 289 U.S. 553 (1933); *Sorrells v. United States*, 287 U.S. 435, 446 (1932); *Smiley v. Holm*, 285 U.S. 355, 365 (1932); *United States v. Ryan*, 284 U.S. 167, 176 (1931); *Popovici v. Agler*, 280 U.S. 379, 383 (1930); *Boston Sand & Gravel Co. v. United States*, 278 U.S. 41, 48 (1928); *Ozawa v. United States*, 260 U.S. 178, 194 (1922); *Johnson v. So. Pac. Co.*, 196 U.S. 1, 14 (1904).

14. *Johnson v. United States*, 163 F. 30, 32 (1st Cir. 1908).

15. *Cabell v. Markham*, 148 F.2d 737, 739 (2d Cir. 1945) (Learned Hand, J.).

16. See, e.g., *Sheftic v. Boles*, 295 F. Supp. 1347, 1349 (N.D.W. Va. 1969); 2A C. SANDS, *supra* note 11, §51.01.

17. 2A C. SANDS, *supra* note 11, § 49.03.

18. *Edwards' Lessee v. Darby*, 25 U.S. (12 Wheat.) 206, 210 (1827). *Accord*,

The proposition has been well stated by Justice Frankfurter when he said that "statutes * * * are not inert exercises in literary composition. They are instruments of government, and in construing them the general purpose is a more important aid to the meaning than any rule which grammar or formal logic may lay down."¹⁹ Therefore, to understand the significance of the Organic Act, it is first important to examine its legislative history.

Legislative History

Prior to the latter part of the eighteenth century, forests in America were protected and managed primarily by individual states and territories. Early federal legislation was limited to the preservation of timber stands for ship building purposes.²⁰ Not until the industrial development of the late eighteenth century and the subsequent depletion of the most accessible timber in the northern states did general interest awaken in the possible exhaustion of the country's timber resources.²¹ In 1882 the Commissioner of Agriculture warned Congress that the heavily timbered lands of the West Coast "are now and have been since the first settlement of the country, undergoing a rapid waste; and the lumbering operations in these forests have been carried on in the most reckless manner * * *."²²

Recognition of forestry investigation as a distinct division of the Department of Agriculture occurred statutorily by an 1886 Act.²³ No real advance in federal forestry legislation occurred until 1891 when a radical shift in national policy as to public forests was made by Congress. Section 24 of the Forest Reserve Act of 1891 provided that:

The President of the United States may, from time to time, set apart and reserve, in any State or Territory having public land bearing forests, in any part * * * covered with timber or undergrowth,

Udall v. Tallman, 380 U.S. 1, 16 (1965); United States v. Midwest Oil Co., 236 U.S. 459, 472-73 (1915); United States v. Hill, 120 U.S. 169, 182 (1887); Sierra Club v. Hardin, 325 F. Supp. 99, 119 (D. Alas. 1971).

19. United States v. Shirey, 359 U.S. 255, 260-61 (1959) (footnote omitted).

20. See, e.g., Act of Feb. 25, 1799, ch. 16, 1 Stat. 622.

21. J. KINNEY, THE DEVELOPMENT OF FOREST LAW IN AMERICA 242 (1917).

22. U.S. DEP'T OF AGRICULTURE, REPORT ON FORESTRY, H.R. Rep. No. 38, 47th Cong., 1st Sess. (1892). See also Gould, *Clearcutting and Economics*, in CLEARCUTTING: A VIEW FROM THE TOP 156 (E. Horwitz ed. 1974).

23. Act of June 30, 1886, ch. 575, 24 Stat. 100.

whether of commercial value or not, as national forests, and the President shall, by public proclamation, declare the establishment of such forests and the limits thereof.²⁴

The restrictive administration of this act by the General Land Office of the Interior Department caused bitter opposition from settlers and interests in the western states primarily because the reserves set aside were protected from any timber cutting, mining, homesteading, grazing or agricultural purposes.²⁵ Congress had failed to provide any meaningful scheme for the administration of this 1891 Act or to outline a purpose for the establishment of forest reserves. The President was not given the authority to return to the public domain any land which became a forest reserve by accident or worked an economic hardship on the inhabitants of the area. Settlers could no longer cut their firewood or build their homes and churches from the trees located on forest reserves.²⁶ It is small wonder that during the next six years Congress debated in various forms bills designed to establish administrative controls for the protection and use of the forest reserves.

A bill which emphasized the need for scientific management of the forest was reported out of the Senate Committee on Agriculture and Forestry during the First Session of the 52nd Congress in 1892. The Senate did not debate this bill or take any other action on it.²⁷

In 1893, during the First Session of the 53rd Congress, after a favorable committee report,²⁸ Representative McRae from Arkansas introduced H.R. 119.²⁹ This bill was hotly debated until 1897.

24. 16 U.S.C. §471 (1970).

25. Note, *Natural Resources-National Forests-The Multiple Use-Sustained Yield Act of 1960*, 41 ORE. L. REV. 49, 57 (1971).

26. 25 CONG. REC. 242 (1893) (remarks of Representative Hartman).

27. 24 CONG. REC. 1318 (1893).

28. Rationale for the favorable committee report is indicated in this passage from their report:

"That prompt and effective legislation on this subject cannot be too strongly urged, Forest reservations have been made which are such only in name. For lack of means they are no more protected by reason of reservation than any other public lands. Information comes almost daily showing continued trespassing and depreddating within the reserves, committed by lumbermen, prospectors, sheep-herders, and others, and forest fires, caused by the careless and vicious, resulting in irreparable damage, especially those started by sheep-herders in the mountain districts in the fall to create new pasturage for the following season."

25 CONG. REC. 2431 (1893).

29. *Id.* at 2371.

H.R. 119 provided for the sale of timber and other administration of the forest reserves. Specifically §2 of H.R. 119 provided:

[t]hat no public forest reservations shall be established except to improve and protect the forest within the reservation or for the purpose of securing favorable conditions of water flow and continuous supplies of timber to the people.³⁰

This particular provision provoked very little debate or controversy in the House. These three purposes—protection, maintenance of watersheds, and continuous supply of timber—were eventually incorporated into the Organic Act of 1897.³¹

The Secretary of the Interior was authorized to make rules “to utilize the timber of commercial value, and to preserve the forest cover from destruction.”³² According to Representative McRae, “the main purpose of this bill * * * is to protect the forest growth against destruction and the preservation of forest conditions upon which the water flow is said to depend.”³³

In a debate two days later to counter the argument that the reserves would be wasted if unavailable for use, Mr. McRae emphasized:

No, I want the forests utilized for all legitimate purposes not inconsistent with the promotion of the growth of the timber cover. Let prospectors, miners, farmers, herdsmen, and all American citizens, under proper restrictions, enter and labor, do their mining, cutting that timber which is authorized to be cut * * * .³⁴

Generally, the arguments against the passage of H.R. 119 were: (1) that if the forests were really to be protected, then no trees should be felled; (2) that the passage of H.R. 119 might delimit the expansion of the public parks system; (3) that the Secretary of the Interior might dishonestly cut and sell all of the timber of commercial value located on forest reserves; (4) that individual settlers, pioneers and miners would not be able to compete with the railroads and other large industry to purchase needed timber from the reserves.³⁵

30. *Id.*

31. 16 U.S.C. §475 (1970).

32. H.R. 119, §3, 53d Cong., 1st Sess. (1893), found at 25 CONG. REC. 2371 (1893).

33. 25 CONG. REC. 2374 (1893).

34. *Id.* at 2433.

35. *Id.* at 2371-75, 2430-35.

A representative from nearly every western state commented on H.R. 119 during this First Session of the 53rd Congress, and in most cases, violent opposition to the McRae bill was voiced. The most strenuous disagreement, in addition to the arguments above, was with §7 of H.R. 119.³⁶ However, Representative McRae retreated in his support of §7, suggesting that the bill could be passed without this provision.³⁷ By the end of the First Session of the 53rd Congress, the House had taken no action and H.R. 119 was withdrawn from the calendar as unfinished business.³⁸

During the Second Session of the 53rd Congress, the House Public Lands Committee passed a revised and amended version of H.R. 119 and reported it to the House. No action was taken.³⁹ Two months later, on July 30, 1894, the Committee on Rules asked for immediate consideration of H.R. 119. The House debated the presence of a quorum and used other delaying techniques which resulted in H.R. 119 finally being tabled.⁴⁰

Congressman McRae was more successful during the Third Session of the 53rd Congress, and the bill was debated at length, amended and finally passed by the House.⁴¹ The amendment, offered by Representative Hermann from Oregon, provided that "for the sole purposes of preserving the living and growing timber on said forest reservations * * * the Secretary of the Interior, under such rules and regulations as he shall prescribe, may eliminate * * * only * * * the dead or matured trees."⁴² These dead or matured trees were to be carefully designated, appraised, and advertised for sale by the Secretary of the Interior.⁴³ Responding to a

36. Section 7 of H.R. 119 is irrelevant to the issues presented by this case. Since this section drew the only real opposition voiced in debating passage of H.R. 119, it is mentioned and printed in full below.

"That any timber on the public lands not within a forest reservation, may be sold by order of the Secretary of the Interior in the same manner as is heretofore provided in this act: *Provided*, That it shall be first shown that such cutting will not be injurious to the public interests: *And provided further*, that no timber on the public lands shall be disposed of except in accordance with the provisions of this act."

25 CONG. REC. 2372 (1893).

37. *Id.* at 2433.

38. *Id.* at 2861-62.

39. 26 CONG. REC. 4745 (1894).

40. *Id.* at 8008-10.

41. 27 CONG. REC. 85-86, 108-15, 371-72 (1894-95).

42. *Id.* at 86.

43. *Id.*

question regarding the safeguards contained in H.R. 119, Representative Hermann declared that the Secretary of the Interior was to make only those rules and regulations which would carry out the purposes and objectives of the bill.⁴⁴

The objectionable §7 had been removed and now most representatives of the western states saw the need for protection and preservation of national forest reserves. Although the bill left to the Secretary of the Interior a good deal of discretion in promulgation of the rules and regulations, the House passed H.R. 119 by a vote of 159 to 53 on December 17, 1894.⁴⁵

The following day, December 18, 1894, H.R. 119 was referred to the Select Senate Committee on Forest Reservations and was reported out with amendments on February 5, 1895.⁴⁶ The Senate amendments to H.R. 119 provided for the sale of

dead and matured trees * * * as may be necessary to preserve the remaining timber * * * . Such timber before being sold shall be marked and designated, and shall not be cut or removed from such reservation except under the immediate personal supervision of some person appointed for that purpose * * * .⁴⁷

This new version of H.R. 119 was passed by the Senate without debate or objection on February 26, 1895.⁴⁸ The bill was sent to a joint House-Senate conference committee, but the 53rd Congressional Session closed with no new legislation for the administration of the forest reserves.

On June 10, 1896, during the First Session of the 54th Congress, the House passed without debate or comment a different version of H.R. 119 than had previously been considered.⁴⁹ The bill was then referred to the Senate, and the forestry issue received no further consideration until President Cleveland created thirteen new forest reserves on February 22, 1897.⁵⁰

The activities which led to the President's proclamation began in early 1896 when the Secretary of the Interior wrote to the presi-

44. *Id.* at 110.

45. *Id.* at 371-72.

46. *Id.* at 427, 1765.

47. *Id.* at 2779.

48. *Id.* at 2780.

49. 28 CONG. REC. 6410-11 (1896).

50. Pres. Proc. Nos. 19-31, Feb. 22, 1897, 29 Stat. 893-912 (creating forest reserves in California, Idaho, Montana, South Dakota, Utah and Wyoming).

dent of the National Academy of Sciences requesting a study of the forest reserves and advice as to a rational forest policy for the United States.⁵¹ The committee visited a number of reserves and in a preliminary report recommended the establishment of thirteen additional forest reserves.⁵² This recommendation prompted President Cleveland's response of February 22, 1897. The final report sent to Congress from the President on May 27, 1897, included the following recommendation:

The fundamental principle of any government system of forest management should be the retention of the fee of forest lands, and the sale of forest products from them at reasonable prices, under regulations looking to the perpetual reproduction of the forest.⁵³

The reaction to the presidential proclamation was prompt. Apparently the boundaries of the new reserves were carelessly drawn and included much land better suited for mining, agriculture and other pursuits. Both Nebraska⁵⁴ and Montana⁵⁵ sent prompt messages to Congress and the President deploring the taking of those lands from the public domain. On February 28, 1897, an amendment to the Sundry Civil Appropriations Bill which would have annulled the proclamation was proposed and agreed to by the Senate.⁵⁶

In conference, however, this provision was not agreed upon by the House which passed its own more detailed amendment.⁵⁷ A second conference was held to consider the House amendment, but it too could not be agreed upon.⁵⁸ More debate took place, and as the 54th Congress drew to a close, both chambers finally agreed to the House version of the amendment.⁵⁹ The bill, however, was pocket vetoed by President Cleveland.⁶⁰

Early in the 55th Congress, the House passed a new Sundry Civil Appropriations Bill without any discussion of the forest re-

51. COMM. APPOINTED BY THE NAT'L ACADEMY OF SCIENCES, REPORT ON A FORESTRY POLICY FOR THE FORESTED LANDS OF THE UNITED STATES, S. Doc. No. 105, 55th Cong., 1st Sess. 7 (1897).

52. *Id.* at 18.

53. *Id.* at 25.

54. 29 CONG. REC. 2480 (Feb. 28, 1897).

55. *Id.* at 2548 (Mar. 1, 1897).

56. *Id.* at 2512, 2517 (1897).

57. *Id.* at 2629-30, 2669, 2677, 2680.

58. *Id.* at 2930, 2931.

59. *Id.* at 2970, 2979-80.

60. 30 CONG. REC. 84 (1897).

serves.⁶¹ When the bill reached the Senate, Senator Pettigrew proposed an amendment which eventually became the Organic Act.⁶² The Amendment's provisions combined the "dead and matured trees" language of the House and the "marked and designated" language of the Senate.⁶³ The Pettigrew Amendment (the Organic Act), stated:

No public forest reservation shall be established except to improve and protect the forest within the reservation, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States * * *.

For the purpose of preserving the living and growing timber and promoting the younger growth on forest reservations, the Secretary of the Interior, under such rules and regulations as he shall prescribe, may cause to be designated and appraised so much of the dead, matured, or large growth of trees found upon such forest reservations as may be compatible with the utilization of the forest thereon, and may sell the same for not less than the appraised value in such quantities to each purchaser as he shall prescribe, to be used in the State or Territory in which such timber reservation may be situated, respectively, but not for export therefrom. * * * Such timber, before being sold, shall be marked and designated, and shall be cut and removed under the supervision of some person appointed for that purpose by the Secretary of the Interior, not interested in the purchase or removal of such timber, nor in the employment of the purchaser thereof.⁶⁴

On May 6, 1897, after lengthy debate, the Senate adopted the Pettigrew Amendment to the appropriations bill.⁶⁵ When the bill reached the House, Congressman McRae urged passage of the forestry amendment in order to "establish a rational and sensible method for administration of these forest reserves."⁶⁶ At the conclusion of debate, however, the House refused to concur in the Pettigrew Amendment.⁶⁷ A conference committee recommended that the House accept the Senate (Pettigrew) Amendment.⁶⁸ The

61. *Id.* at 83-87.

62. *Id.* at 899-900.

63. This language, on which the *Izaak Walton League* case was based, was not extensively debated or discussed by Congress at any time.

64. 30 CONG. REC. at 900.

65. *Id.* at 925.

66. *Id.* at 968.

67. *Id.* at 1013.

68. *Id.* at 1242-43, 1397.

Senate concurred in the conference report⁶⁹ and on June 1, 1897, the House finally accepted the committee's report and passed the bill with the Pettigrew Amendment.⁷⁰ The bill was signed into law by the President⁷¹ and §24 of the Forest Reserve Act of 1891⁷² was finally given the additional statutory recognition necessary for the proper administration of national forest reserves.

The sections of the Organic Act on which plaintiffs brought this action are only a small part of the total content of the Act. In all the debates which preceded the enactment of this law, there was very little discussion of the specific manner in which the timber would be cut and sold. Instead, the debates mainly concerned whether the timber on the land designated as forest reserves should be used at all and, if so, by whom. Also the debates were concerned with the annulment of the presidential orders creating new forest reserves. Read as a whole, the Organic Act of 1897 emphasizes *utilization* of the forests (for which the Act of 1891 did not provide) and continued development of the forest for future growth. Neither the words of the Organic Act themselves nor the legislative history of the Act clearly indicates whether the trees must be marked and designated *individually* (as in select cutting) or by area (as in clearcutting). Thus, perhaps the most persuasive extrinsic aid which could be used to determine the validity of clearcutting under the Organic Act would be subsequent related legislation and the interpretation given to the Act by the Secretary of Agriculture and the Forest Service.

Subsequent Legislation

On February 1, 1905, the administration of the National Forest Reserves was transferred from the Secretary of the Interior to the Secretary of Agriculture.⁷³ Congress provided that the Secretary of the Agriculture "shall execute * * * all laws affecting public lands."⁷⁴ Speaking on the floor of the House, Representative Lacey of Iowa inferred that the purpose of the bill was to provide for the scientific management of the forests. He stated:

69. *Id.* at 1285.

70. *Id.* at 1401.

71. Organic Act of 1897, ch. 2, 30 Stat. 35.

72. 16 U.S.C. §471 (1970).

73. Transfer Act of Feb. 1, 1905, ch. 288, 33 Stat. 628 (codified in scattered sections of 16 U.S.C.).

74. 16 U.S.C. §472 (1970).

All of the machinery for the scientific control of the forests of the country is today in the Department of Agriculture. It has been so for several years; in fact, this machinery was created, a bureau established, and experts selected in that Department at a time when that Department controlled no forests whatever, and the work of these men has been largely scientific.⁷⁵

The Appropriation Act of 1907 declared that the forest reserves should thereafter be called national forests. In addition, the Act forbade the creation of additional national forests, or additions to existing ones, by executive order, within the states of Idaho, Montana, Wyoming, Colorado, Washington and Oregon.⁷⁶ This was intended, according to the Secretary of Agriculture, to indicate that existing reserves were to be used and not merely preserved.⁷⁷

In 1907 Congress appropriated money to care for fish to be stocked in national forest waters.⁷⁸ Debates on the floor of the Senate reflected the acquiescence of Congress in the regulations under which the forests were being administered by the Forest Service.⁷⁹

In 1911, another important step was taken by the United States in forest policy. The Weeks' Law authorized the expenditure during the next succeeding five years of nine million dollars for the examination, survey and acquisition of lands located at "the head waters of navigable streams or those which are being or which may be developed for navigable purposes."⁸⁰ Prior to this enactment there had been limited public domain in states east of the Mississippi and since the year 1891 Presidents had found only "remnants of public land east of the plains of Florida, Alabama, Michigan, Arkansas, and Minnesota, on which to establish reserves."⁸¹

75. 39 CONG. REC. 166 (1905).

76. Act of Mar. 4, 1907, ch. 2907, 34 Stat. 1269, 1271 (codified at 16 U.S.C. §471(a) (1970)).

77. 41 CONG. REC. 3529 (1907) (letter from the Secretary to Gifford Pinchot, the leading American forester of the time, which was read into the floor record).

78. Appropriation Act of Mar. 4, 1907, ch. 2907, 34 Stat. 1270.

79. See, e.g., 41 CONG. REC. 3528 (1907):

"Timber on the natural reserves which can be cut safely and for which there is actual need is for sale. * * * Green timber is for sale except where its removal makes a second crop doubtful or reduces the timber supply below the point of safety for local needs or injures the streams."

This was from a report by Gifford Pinchot of the Forest Service read into the record with the hearty approval of Senator Spooner.

80. Ch. 186, § 3, 36 Stat. 961 (1911).

81. R. LILLARD, *THE GREAT FOREST* 274 (1973).

The Weeks' Law also provided for cooperation between the federal government and the states for fire protection.⁸² Any state receiving federal aid was required to have laws providing for forest fire protection and to "spend at least as much as the Federal government in such protective work."⁸³

The Weeks' Law was amended in 1924 by the Clarke-McNary Reforestation Act to allow for the purchase of lands for the production of timber in watersheds of navigable rivers.⁸⁴ The bill was the first to emphasize the continuous production of timber. The House Committee on Agriculture in its report on the original bill stated a concern for a "cheap and available supply of timber."⁸⁵

The McNary-McSweeney Reforestation Act of 1928 made research a part of federal Forest Service policy.⁸⁶ It provided for the scientific management of the forests, undertaking to "insure adequate supplies of timber and other forest products."⁸⁷ The Act required the determination and promulgation of the best methods of producing, managing and utilizing timber on the national forests and provided for a broad program of scientific investigation.⁸⁸

82. 16 U.S.C. §563 (1970).

83. J. KINNEY, *supra* note 21, at 250.

84. Act of June 7, 1924, ch. 348, 43 Stat. 653 (codified at 16 U.S.C. §565 (1970)).

85. HOUSE COMM. ON AGRICULTURE, REPORT ON PROTECTION OF FOREST LANDS, H.R. Rep. No. 439, 68th Cong., 1st Sess. 7 (1924).

86. 16 U.S.C. §581a-1 (1970).

87. *Id.* at §581.

88. "The Secretary of Agriculture is authorized and directed to conduct such investigations, experiments, and tests as he may deem necessary * * * in order to determine, demonstrate, and promulgate the best methods of reforestation and of growing, managing, and utilizing timber, forage, and other forest products, of maintaining favorable conditions of water flow and the prevention of erosion, of protecting timber and other forest growth from fire, insects, disease, or other harmful agencies, of obtaining the fullest and most effective use of forest lands, and to determine and promulgate the economic considerations which would underlie the establishment of sound policies for the management of forest land and the utilization of forest products * * *."

16 U.S.C. §581 (1970). See also R. LILLARD, *supra* note 81, at 274 indicating that: "[t]he Forest Products Laboratory and a dozen regional Forest and Range Experiment Stations stepped up their manifold researches into pruning of young forest trees, diseases, selective logging that spares saplings and seed trees, exploitation of 'inferior' species and waste parts, fighting fires by airplane, techniques for turpentineing that lengthen the life of the tree and save its timber value, the relationship of livestock to forest production, of erosion on steep hillsides to plantations of timber and nut trees."

In the Knutson-Vandenberg Act of 1930, Congress provided that the Secretary of Agriculture could require purchasers of national forest timber to make deposits of money, in addition to payments for timber to cover timber maintenance and management costs.⁸⁹ The Senate report on the bill indicated an urgent need for legislation establishing guidelines for the planting and harvesting of trees in national forests.⁹⁰

In 1944, to promote economic stability and provide for a regular supply of forest products and regular stream flow, the Sustained Unit Act was passed, authorizing the Forest Service to waive normal competitive bidding in federal timber sales when nearby lumber communities were economically dependent on national forest timber or where private owners were willing to include their land in a government-supervised sustained-yield unit and modify practices in accord with procedures set up for such units.⁹¹ In 1956, Congress provided for long term leases on forest lands for recreational purposes.⁹²

The Multiple Use-Sustained Yield Act of 1960 was the first legislation since the Organic Act to address itself to the purposes for which national forests as a whole exist.⁹³ Congress provided "that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes."⁹⁴ It authorized the Secretary of Agriculture "to develop and administer" national forests resources "for multiple use and sustained yield of the several products and services obtained therefrom."⁹⁵ The history of the Multiple Use-Sustained

89. 16 U.S.C. §576b (1970).

90. SENATE COMM. ON AGRICULTURE AND FORESTRY, ENLARGE TREE-PLANTING OPERATIONS IN NAT'L FORESTS, S. Rep. No. 375, 71st Cong., 2d Sess. 3 (1930).

91. 16 U.S.C. §583a (1970).

92. *Id.* §497.

93. *Id.* §§ 528-31.

94. *Id.* §528.

95. *Id.* The act also defined "multiple use" and "sustained yield" as follows:

"Multiple use' means: The management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people * * *."

"Sustained yield of the several products and services' means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the national forests without impairment of the productivity of the land."

Id. §531.

Yield Act repeats the intent of Congress to recognize the long established management practices of the Forest Service.

The [Organic Act] refers both to watersheds and timber as purposes for which the national forests are established. Through the years by a number of congressional enactments, including appropriations for carrying out specific activities and functions, through court decisions, and through policy directives and statements, the management of the national forests under the principle of multiple use has been thoroughly recognized and accepted. The application of the principle of sustained yield management has also been thoroughly established. It is thus desirable that the Secretary of Agriculture have a directive to administer the national forests under the dual principles of multiple use and sustained yield.⁹⁶

Hearings were held in April, May and June of 1971, by the Subcommittee on Public Lands of the Senate Committee on Interior and Insular Affairs on the subject of clearcutting practices on national timberlands. These hearings are known as the "Church Hearings."⁹⁷ The Subcommittee submitted a report in March of 1972 reflecting an extensive review of Forest Service timber management policies.⁹⁸ The Subcommittee's report summarized the testimony as follows:

Even-aged timber management, which involved clear-cutting is one kind of timber management. Even-aged timber management is an acceptable, professionally recognized, and reputable type of timber management that is wisely practiced in Europe, North America and Asia for perpetuation of species whose ecological requirements include full sunlight, and where soil, slope and local climate conditions dictate. Most professional foresters testified that clear-cutting as a harvesting practice is the only feasible means of continuing production of forest crops of certain species in certain locations.⁹⁹

96. HOUSE COMM. ON AGRICULTURE, REPORT ON THE ADMINISTRATION OF NATIONAL FORESTS FOR MULTIPLE USE AND SUSTAINED YIELD, H.R. Doc. No. 1551, 86th Cong., 2d Sess. 2-3 (1960). See also, *Dorothy Thomas Foundation, Inc. v. Hardin*, 317 F. Supp. 1072, 1075 (W.D.N.C. 1971) in which the court expressly stated that the Multiple Use Sustained Yield Act must be read in light of the Organic Act.

97. *Hearings on "Clearcutting Practices" on Nat'l Timberlands before the Subcomm. on Public Lands of the Senate Comm. on Interior and Insular Affairs*, 92d Cong., 1st Sess. (1971) [hereinafter cited as the *Church Hearings*].

98. SUBCOMM. ON PUBLIC LANDS OF THE SENATE COMM. ON INTERIOR AND INSULAR AFFAIRS, 92d Cong., 2d Sess. REPORT ON CLEARCUTTING ON FEDERAL TIMBERLANDS (Comm. Print 1972) [hereinafter cited as REPORT ON CLEARCUTTING].

99. *Id.* at 2. Note the following conclusions made by the Committee:

"The Subcommittee does not question that under appropriate condi-

The Subcommittee found that the present concern with clear-cutting in national forests was probably brought about by a combination of factors, including:

1. General application of clearcutting to eastern hardwood stands in 1964. Before 1964 those forests were harvested "primarily by partial cutting, either the selection or shelterwood systems."
2. The increase in forest service allowable cuts over the last decade and the corresponding income in timber sales and harvesting activities.
3. The manner in which clearcutting is sometimes applied including "examples where there are large blocks or strips of 1,000 acres or more, close spacing of blocks, cutting on steep slopes, large amounts of slash and waste, accelerated erosion, and generally devastated appearances."
4. Increased national concern over the growth and protection of the environment by the public.
5. An increased desire to participate in decision-making by public administrations.
6. "[T]he alleged failure of the Forest Service in some instances to be responsive to concerns about the environmental impacts of timber harvesting and management practices

* * * "100

The Subcommittee also made extensive recommendations on future clearcutting application.¹⁰¹

tions clear-cutting is a necessary, scientific, and professional forestry tool, nor does it believe Congress should legislate professional forestry practices in public land management any more than it does engineering practices for the Bureau of Reclamation or medical practices for the Veterans Administration. However, if these practices lead to basic questions of acceptable environmental impacts, national policy objectives, and conformance with existing statutes, Congress should take a look."

Id.

100. *Id.* at 3-4.

101. *Id.* at 9 stating: "[T]he Subcommittee believes timber management activities * * * should be subject to the following policy guidelines:

"1. *Allowable harvest levels*

"a. Allowable harvest on Federal forest lands should be reviewed and adjusted periodically to assure that the lands on which they are based are available and suitable for timber production under these guidelines.

"b. Increases in allowable harvests based on intensified management practices such as reforestation, thinning, tree improvement and the like should be made only upon demonstration that such practices justify in-

The Council on Environmental Quality in 1971 retained the deans of five forestry schools in the United States to make independent studies of clearcutting in their regions. The corresponding reports stressed the urgency of the problem and the need for additional research.¹⁰² None recommended a ban on clearcutting.

Dean Bethel of the University of Washington stated that "a moratorium on clear-cutting will have both short and long-run economic consequences," and concluded that a ban on all clearcutting would tend to reduce harvesting by approximately twenty-four percent if the ban applied only to federal lands.¹⁰³ Dean Bethel

creased allowable harvests, and there is assurance that such practices are satisfactorily funded for continuation to completion.

"If planned intensive measures are inadequately funded and thus cannot be accomplished on schedule, allowable harvests should be reduced accordingly[.]

"2. *Harvesting limitations*

"Clear-cutting should not be used as a cutting method on Federal land areas where:

"a. Soil, slope or other watershed conditions are fragile and subject to major injury.

"b. There is no assurance that the area can be adequately restocked within five years after harvest.

"c. Aesthetic values outweigh other considerations.

"d. The method is preferred only because it will give the greatest dollar return or the greatest unit output.

"3. *Clear-cutting should be used only where:*

"a. It is determined to be silviculturally essential to accomplish the relevant forest management objectives.

"b. The size of clear-cut blocks, patches or strips are kept at the minimum necessary to accomplish silvicultural and other multiple-use forest management objectives.

"c. A multidisciplinary review has first been made of the potential environmental, biological, aesthetic, engineering and economic impacts on each sale area.

"d. Clear-cut blocks, patches or strips are, in all cases, shaped and blended as much as possible with the natural terrain.

"4. *Timber sale contracts*

"Federal timber sale contracts should contain requirements to assure that all possible measures are taken to minimize or avoid adverse environmental impacts of timber harvesting, even if such measures result in lower net returns to the Treasury."

102. These reports may be found at 118 CONG. REC. S. 6228-37 (daily ed. Mar. 1, 1972), and are summarized in CONGRESSIONAL RESEARCH SERVICE, LIBRARY OF CONGRESS, AN ANALYSIS OF FORESTRY ISSUES IN THE FIRST SESSION OF THE 92D CONGRESS (Senate Comm. on Interior and Insular Affairs Print 1972) [hereinafter cited as FORESTRY ISSUES].

103. FORESTRY ISSUES at 35.

also estimated that clearcutting would account for approximately sixty-three percent of the total harvest of Washington, Oregon and Alaska in 1969.¹⁰⁴

During the appropriation hearings in the Senate for the Department of Agriculture, fiscal year 1972,¹⁰⁵ clearcutting received similar attention. Senator McGee specifically asked Secretary Hardin the effect of harvesting by clearcutting on the national forests. The Secretary replied:

A switch to selection cutting on all acres would substantially reduce growth and yields, possibly by 50 percent or more. Thus, a reduction or elimination of clear-cutting would have the effect of substantially reducing the national forest sustained yield allowable cut.¹⁰⁶

The administration of the national forests in recent years has been an issue frequently before Congress. In April of 1972 the Congressional Research Service of the Library of Congress, at the request of the chairman of the Senate Committee on Interior and Insular Affairs, prepared a report of forestry issues facing Congress. The report summarized recent clearcutting issues noting that criticism of clearcutting, particularly in the Monongahela National Forest had been especially severe.¹⁰⁷ On June 20, 1972, hearings were held on bills to establish a commission to investigate clearcutting of timber on public lands.¹⁰⁸

The importance of the national forests as a supply of timber is reflected in a bill introduced in Congress entitled the Wood Supply and National Forest Lands Investment Act of 1973.¹⁰⁹ The bill includes the following findings by Congress:

[I]n order to meet increasing national demands for lumber and related wood products, including that needed for homebuilding construction, it is necessary to provide for an orderly, and substantial increase in the timber yield from the commercial forest lands of the Nation, including that in the national forest; and that through in-

104. *Id.*

105. *Hearings on Agriculture-Environmental and Consumer Protection Appropriations for Fiscal Year 1972, H.R. 9270, Before a Subcomm. of the Senate Comm. on Appropriations, 92d Cong., 1st Sess. (1971).*

106. *Id.* at 306.

107. FORESTRY ISSUES at 7.

108. *Hearing on Establishment of a Commission to Investigate Clearcutting of Timber on Public Lands, H.R. 14354, H.R. 14888, H.R. 15042 & H.R. 15077, Before the Subcomm. on Forests of the House Comm. on Agriculture, 92d Cong., 2d Sess. (1972).*

109. S. 1775, 93d Cong., 2d Sess. (1973).

tensified development and management such land is capable of producing a substantially increased yield.¹¹⁰

Legislation subsequent to the Organic Act indicates a pattern of Congressional desire that the forests be "scientifically managed" to provide "a continuous supply of timber for the use of the citizens of the United States."¹¹¹ The transfer of national forest management from the Secretary of the Interior to the Secretary of Agriculture was intended to consolidate scientific management within the Department of Agriculture with actual land use.¹¹²

More recently, the Multiple Use-Sustained Yield Act gave statutory approval to scientific forest management methods.¹¹⁶ Moreover, Congress has in the past few years investigated clearcutting in depth through the Church Hearings and other activities.¹¹⁷ In 1971 the Council on Environmental Quality retained the deans of five forestry schools to make independent studies of clearcutting: "None recommended a complete ban."¹¹⁸ Dean Bethel of the University of Washington concluded that the economic effect of a total ban would be significant.¹¹⁹

Administrative Interpretation

The need to manage the forests scientifically and the utility of clearcutting for some light-foliaged trees was recognized by the Chief of the Division of Forestry, Bernard E. Fernow as early as 1882.¹²⁰ In *Surveys of Forest Reserves*, Gifford Pinchot included the following in his 1898 report:

Forest management in this [Bighorn] reserve requires first of all protection against fire. * * * The system of clear cutting in strips will probably best accomplish the desired result in this reserve, where the reproduction of the forest is vigorous, and the soil and climate are adapted to forest growth.¹²¹

110. *Id.* § 2(b).

111. 16 U.S.C. §§ 475, 476 (1970).

112. See the discussion accompanying notes 73-75 *supra*.

116. 16 U.S.C. §§ 528-31 (1970) (enacted June 12, 1960).

117. See, e.g., authorities cited in notes 99, 102, 106 and 108 *supra*.

118. FORESTRY ISSUES, *supra* note 102.

119. *Id.*

120. Fernow, *Conditions of Forest Growth*, AM. J. FORESTRY, Nov. 1882, at 68, Dec. 1882, at 101.

121. SECRETARY OF THE INTERIOR, REPORT ON THE SURVEY AND EXAMINATION OF FOREST RESERVES (MARCH), 1898, S. Doc. No. 189, 55th Cong., 2d Sess. 53 (1898). In a letter transmitting the report to the Senate the Secretary acknowledged Gifford Pinchot as the author of the report. *Id.* at 1, 35.

Suggestions of a similar nature were made for the Cascade, Flat-head and Lewis and Clark Reserves.¹²²

The Organic Act and subsequent legislation authorized the Secretary of the Agriculture to provide for the protection of "public forests" in furtherance of the purposes and objectives of the Act.¹²³ The regulations of the Secretary of Agriculture over the past seventy-five years attempting to implement this policy have had a profound effect on national forest management.¹²⁴

In June 1905, following passage of the Transfer Act,¹²⁵ the Secretary of Agriculture issued a manual of regulations which give some indication of timber management practices accepted at the time.¹²⁶ In this manual, the Secretary permitted the designation of trees without individual marking.¹²⁷

The 1906 and 1907 regulations, however, revised prior procedures. Regulations there provided that timber could only be cut "on the area designated by the forest officer" and that "no living tree may be cut until marked or otherwise unmistakably designated* * *."¹²⁸

122. *Id.* at 74, 78, 83, 86.

123. *See, e.g.*, 16 U.S.C. § 476 (1970) and 16 U.S.C. § 471 (1970).

124. This effect has been due in part to the standard of judicial review applied by the courts. *See, e.g.*, *Dorothy Thomas Foundation, Inc. v. Hardin*, 317 F. Supp. 1072, 1076 (W.D.N.C. 1970), stating that the decisions of the Secretary of Agriculture with respect to the marking of timber on national forests, are subject to review only for a determination of whether the secretary's actions were " 'arbitrary, capricious, and abuse of discretion, or otherwise not in accordance with law,' or that such action 'was without observance of procedure required by law.' "

125. Transfer Act of Feb. 1, 1905, ch. 288, 33 Stat. 628 (codified in scattered sections of 16 U.S.C.).

126. FOREST SERVICE U.S. DEP'T OF AGRICULTURE, THE USE OF THE NATIONAL FOREST—REGULATIONS AND INSTRUCTIONS (1905).

127. "All timber on forest reserves which can be cut safely and for which there is actual need is for sale. Applications to purchase are invited. Green timber may be sold except where its removal makes a second cut doubtful, reduces the timber supply below the point of safety, or injures streams. All dead timber is for sale."

Id. at 31-32. If, in addition, the designation of individual trees without marking was permitted:

"When the sale of any green timber is assured, the Supervisor will order the marking of all trees to be cut. This is imperative. Where only dead timber is purchased, and there is no danger that living trees will be cut, the Forest Officer may instead of marking every tree blaze or mark the boundary of the cutting area and instruct the purchaser in the manner of cutting."

Id. at 47.

128. FOREST SERVICE, U.S. DEP'T OF AGRICULTURE, THE USE OF THE NATIONAL

By 1908 the practice of marking or designating individual trees was widely accepted. Regulations in that year provided that "no tree shall be cut under contract until marked or otherwise designated * * *."¹²⁹

In 1911 the National Forest Service manual replaced the use book.¹³⁰ Additional guidelines regarding cutting practices were set forth:

Before cutting commences the best method should be determined. Whether a clear cutting, selection, or group system or merely a light thinning is best can only be determined after careful study on the ground.¹³¹

The 1949 National Forest Service manual provided for the harvesting of "mature" trees regardless of "age or years."

A tree which should be cut in a thinning in order to improve the condition of the stand is "mature" irrespective of its age and years. A tree which has attained a size and a form which make it suitable for meeting some definite and useful purpose, such as a telephone pole or a piling, may be "mature" if there is a greater need for that product than the prospective need for the wood of the tree in some other form such as the sawlogs which might be obtained if it were left to grow. Some forest areas, even if containing very old trees, will have greater public usefulness if left intact for scenic, inspirational, watershed protective or other purposes, than would result from the present consumption of their wood, and such areas should not be cut. Maturity will be determined by present or future public benefit, and not solely on the basis of years of age or sale value on the stump.¹³²

Present regulations require management of the timber in the national forest "based on the principle of sustained yield" and

FOREST—REGULATIONS AND INSTRUCTIONS, Reg. No. 22 (1906); FOREST SERVICE, U.S. DEP'T OF AGRICULTURE, THE USE OF THE NATIONAL FOREST—REGULATIONS AND INSTRUCTIONS, Reg. No. 31 (1907). Compare the language of the Act which, contrary to the 1906-1910 regulations, does not use the term *tree*, suggesting its specific sense. Rather, it may be argued that the Act speaks in terms of an *area* designation: "Such *timber*, before being sold, shall be marked and designated * * *." 16 U.S.C. §476 (1970) (emphasis added).

129. FOREST SERVICE, U.S. DEP'T OF AGRICULTURE, THE USE OF THE NATIONAL FOREST, REGULATIONS AND INSTRUCTIONS, Reg. No. 37 (1908).

130. FOREST SERVICE, U.S. DEP'T OF AGRICULTURE, THE NATIONAL FOREST MANUAL (1911).

131. *Id.* at 37.

132. FOREST SERVICE, U.S. DEP'T OF AGRICULTURE, THE NATIONAL FOREST MANUAL (1949).

“shall aid in providing a continuous supply of national forest timber for the use and necessities of the citizens of the United States.”¹³³

The Supreme Court has emphasized that courts should give weight to the interpretation placed upon a statute by administrators who have the responsibility to implement the statute.¹³⁴ In addition, an administrative interpretation is given “considerable weight” unless it is plainly erroneous or inconsistent with the regulation.¹³⁵ Administrative interpretation by the Department of Agriculture indicates a systematic application of timber harvesting techniques contrary to the district court’s interpretation in *Izaak Walton League*. The first management study of national forest reserves by Gifford Pinchot, recommended clearcutting in a number of forests.¹³⁶ The Transfer Act of 1905 gave the Secretary of Agriculture authority to supervise the execution of all laws and regulations affecting public lands.¹³⁷ Under this Act the Forest Service implemented the Organic Act, after a few years of indecisiveness, by clearly authorizing timber harvesting by clearcutting.¹³⁸ Furthermore, although recent Forest Service regulations prefer to emphasize a balancing of various interests involved in the use of the forests without mentioning harvesting techniques, in reality clearcutting is widely practiced in the National Forests.

CLEARCUTTING AS SOUND SCIENTIFIC MANAGEMENT

The *Izaak Walton League* court’s construction of the Organic

133. See 36 C.F.R. §221.3(a)(1), (3) (1973).

134. See, e.g., *United States v. Midwest Oil Co.*, 236 U.S. 459, 472-73 (1915) stating:

“It may be argued that while these facts and rulings prove a usage they do not establish its validity. But government is a practical affair intended for practical men. Both officers, lawmakers and citizens naturally adjust themselves to any long-continued action of the Executive Department—on the presumption that unauthorized acts would not have been allowed to be so often repeated as to crystallize into a regular practice. That presumption is not reasoning in a circle but the basis of a wise and quieting rule that in determining the meaning of a statute or the existence of a power, weight shall be given to the usage itself—even when the validity of the practice is the subject of investigation.”

135. *Bowles v. Seminole Rock & Sand Co.*, 325 U.S. 410, 414 (1945).

136. See the text accompanying note 121 *supra*.

137. 16 U.S.C. §472 (1970).

138. See notes 126 through 130 *supra*.

Act prohibiting clearcutting is not supported by the legislative history or administrative interpretation of the Act. Subsequent acts by Congress have required management of the national forests in a scientific manner. The legislative history indicates that at the turn of the century clearcutting was considered by leading foresters to be a scientific method of forest management. Subsequent studies have indicated that a ban on clearcutting would be economically devastating. Furthermore, regulations established by the Secretaries of the Interior and Agriculture indicate a long-standing interpretation of their statutory charge to administer the forests in a scientific manner as including clearcutting. However, because of the rapid changes in technology and environmental concern in the last 80 years, it is necessary to reappraise clearcutting as a scientific technique of forest management by today's standards.

The advantages and disadvantages of clearcutting as a forest management technique have been argued extensively. This discussion will address the effects of clearcutting on the following general characteristics of the forest: (1) watershed areas, (2) regeneration of timber, (3) nutrient loss from the soil, (4) wildlife, (5) recreation, and (6) the economics of logging.

Effects On Watershed Areas

A watershed is defined as "[t]he total area of land above a given point on a waterway that contributes run-off water to the flow at that point."¹³⁹ To speak of the effects clearcutting may have on a watershed, one must consider the soil itself and both the quantity and quality of the run-off water.

One of the primary objections to clearcutting is that it damages the cleared land by causing excessive erosion, land slides, and chemical nutrient leaching.¹⁴⁰ Research has shown, however, that

[i]n itself, clearcutting and felling does not harm the watershed; the danger of damage being done occurs during timber removal.

* * *

139. H. HANSON, *DICTIONARY OF ECOLOGY* 370 (1972).

140. "Clearcutting causes rapid runoff of water, thus upsetting the watershed value of the forest. It causes accelerated soil erosion and the leaching of important soil nutrients thus reducing productivity * * *. On steep slopes it frequently causes land slides, a matter of enormous concern on the Pacific Coast and Alaska."

Church Hearings, *supra* note 97, at 100 (statement of Gordon Robinson of Sierra Club).

* * *

* * * [P]lanning in advance of logging can prevent much of this. The logger should confine the roads to the ridge tops, away from the stream channels * * * [so] the storm water [can] spread out and infiltrate the forest floor. * * *

Skidding should be uphill to a ridgetop landing. This results in a fan-shaped distribution of skid trails as they go downhill, dispersing any water moving down the trail rather than concentrating it as would be the case if the landing were the bottom.¹⁴¹

The primary threat to the retention of the soil following a logging operation is the road system and method of removal. It would seem that the logical logging method to use from this standpoint is the one which minimizes the number of miles of road and the length of time the roads are used. Further, it would be helpful if skidding distances for felled trees could be minimized. This suggests clearcutting.

[F]or the more concentrated the logging operation, the fewer miles of road are needed for transport of logs to market. Where a cut is completed quickly and further logging is not needed [as would be required with selection cutting], the road can be permitted to "decay."¹⁴²

Properly managed, with sufficient prior planning, clearcutting as a procedure does not damage the physical characteristics of the land cleared. The problems commonly attributed to clearcutting are not unique to it. These problems are independent of the type of cutting being done. Some studies, for instance, indicate that even on steep slopes, clearcutting with properly designed road systems will not cause serious erosion.¹⁴³

Water

It has generally been accepted that there is a relationship between forest cover and stream flows. Forests intercept precipitation and break its impact on the soil. Roots of forest vegetation

141. Williston, *Timely Tips on Watershed Management for The Timberland Owner*, FOREST FARMER, June 1973, at 8, 9, 16.

142. Horwitz, *The Problem-A Matter of Definitions, Methods and Priorities*, in CLEARCUTTING: A VIEW FROM THE TOP 29 (E. Horwitz ed. 1974).

143. Ward, *Clearcutting in the Hardwood Forests of the Northeast*, in CLEARCUTTING: A VIEW FROM THE TOP 69 (E. Horwitz ed. 1974). See also Wilson, *Man's Activities in Watershed Areas-A Need for Planning*, 4 ENV. L. 229, 243 (1974).

stabilize the soil and prevent erosion. The organic material added to the soil aids in its ability to absorb water, preventing overland flow and reducing flood peaks. Large amounts of water are used by the forest vegetation and through transpiration are lost back to the atmosphere.¹⁴⁴

Since the turn of the century, many studies have been conducted on experimental watersheds to determine the effects of various cutting methods on the water yield. From the first of these, the famous Wagon Wheel Gap experiment, through present day tests, it has been conclusively demonstrated that wildland water yields are increased temporarily by clearcutting forest stands.¹⁴⁵

Studies done at the Coweeta Hydrologic Laboratory, North Carolina are typical of those conducted elsewhere. Although the following results may not be conclusively applied to all areas, they provide useful thumb rules:

- (1) Increases in water yield the first year after treatment vary proportionately with the percentage of forest cover removed.¹⁴⁶
- (2) The water yield increases almost invariably decline soon after cutting.¹⁴⁷

144. Ward, *supra* note 143, at 70.

145. Tryon, *Partial Cutting and Increased Water Yields-A New Multiresource Approach*, 27 J. SOIL & WATER CONSERVATION 66 (1972).

146. Church Hearings, *supra* note 97, at 888.

147. *Id.* at 890.

"In Fig. 4 the vegetation was allowed to regrow for 23 years [after clearcutting]. The curve imposed over the bar graph is Kovner's (1956) log-time trend (the decline of yield increase is a linear function of the logarithm of time in years since treatment). By extrapolating this relationship, Kovner suggested that increases would be negligible after the thirty-fifth year. By the twenty-third year, when the area was recut, his relationship was still valid."

(3) The water yield decreases linearly with the percentage of afforestation of bare land.¹⁴⁸

In a paper presented at the Church Hearings, Irvin Reigner summarized the body of knowledge relating to water savings (more often referred to as increased yield) and watershed management:

We have learned that water savings are provided when some form of heavy cutting is applied to forest areas. Selective removal of single trees in the forest does not seem to save any water. Presumably, the roots of the adjacent trees move into the space occupied by the roots of the removed tree and utilize the extra water. But when a group of trees is removed, the bordering trees will not take over all of the rooting space made available because of the distances involved. However, these savings are eventually lost through the regrowth of new trees. Thus, the removal area need not be large; cutting in small blocks or strips, or even group selection of trees to be removed will produce the desired effect.

Single-purpose management for water supply augmentation may be appropriate for municipally owned watersheds or on other areas where water is desperately needed. Large amounts of extra water can be produced from municipal watersheds in humid mountain areas if intensive management * * * is applied. * * *

* * *

* * * Watershed management is not a panacea for all of the ills of

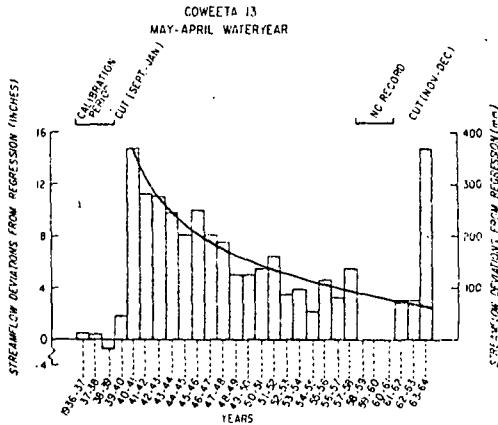


FIG. 4. Deviations from regression of annual streamflow for Coweeta Watershed 13 on annual streamflow for control watershed during calibration (1936-9) and treatment (1939-64) periods.

Id. at 890-91. Note also, that when a second cut was made after year twenty-three the increase in stream flow was almost identical to the increase after the first cutting.

148. Church Hearings, supra note 97, at 892.

the water resource. But * * * we firmly suggest that vegetation management should have its place in the overall plan.¹⁴⁹

Our forests can be managed to supply increased water yields on a perpetual basis. Clearcutting, as a harvest technique, maximizes the water yield from a forested watershed. When a part of the stand is harvested, the yield from the area increases sharply and it is several years before it returns to normal as reforestation takes place. When harvesting the watershed on a regular schedule, the newly cleared areas add their increased outputs as the yield from older cuts declines. The result is a steady supply of water in greater volumes than obtainable with selection cutting.¹⁵⁰

One might ask, in an area where water is plentiful and there are no supply problems, why worry about the increased capacity of watersheds available with the practice of clearcutting? Most of the increased water flow occurs during the summer and early fall months, traditionally the periods of lowest supply and highest demand. The increases that occur during the months of October through March can be generally thought of as spreading the peak yield out over a longer period of time. The snow accumulates preferentially in the cleared areas. These accumulations melt sooner than snow shaded by the forest and this has the effect of desynchronizing the snowmelt and distributing its water yield over a longer period of time. The result is lower spring flood peaks and less flood damage.¹⁵¹

Water quality may also be affected by clearcutting. When streams normally shaded by a surrounding forest are exposed to the sunlight an increase in stream temperature occurs. This rise in temperature, if slight, can be beneficial in mountain streams, but if not adequately controlled may have detrimental effects on the ecological community of the stream.¹⁵² This topic is discussed in more detail *infra*.

149. *Id.* at 903.

150. *Id.* at 816.

151. James, *Clearcutting in the Public Forests of the North Central Region*, in *CLEARCUTTING: A VIEW FROM THE TOP* 52 (E. Horwitz ed. 1974).

152. "The resulting rise in temperature speeds up the decay process and may even change the character of the stream from that of a cold water, trout community to a warm water community, lower in oxygen and considered less desirable for fishing purposes." Ward, *supra* note 151, at 70. "This [temperature rise brought about by clearcutting] may pose a problem but in many mountain streams at the higher elevations a little warming would be likely to lead to an increase in productivity rather than to a decrease." Dils, *supra* note 151, at 115.

If, as discussed above,¹⁵³ inadequate or poorly planned logging procedures and roads are used, excessive erosion may occur, followed by siltation, and excessive addition of nutrients to the streams may result. This could lead to increased eutrophication in the streams and heavy growths of algae. This result, however, may occur with any logging scheme and is not caused by the harvest technique utilized. With proper management, erosion is not a serious problem and addition of sediment and nutrients will be small. In some cases, these small additions will be beneficial to the community of the stream.¹⁵⁴

With regard to the watershed, clearcutting is an acceptable silvicultural technique and has beneficial effects on the water yield which make it preferable to selection cutting. It should be stressed that proper advance planning of logging techniques is imperative to insure these benefits are obtained and the possible detriments to water quality avoided. These procedures do exist and when used, provide the desired results.¹⁵⁵

Regeneration

After any harvest of the forest, whether by selection cutting methods or clearcutting, a primary concern is the forest's ability

153. Williston, *supra* note 141, at 8, 9, 16.

154. See authorities cited *supra* notes 141, 142, 143.

155. One such procedure is tree pulling,

"a relatively new practice currently in use on some private timber lands. With this system trees are no longer permitted to crash onto the hillside, damaging themselves and possibly others in the vicinity. Instead, a heavy steel cable is attached to the trunk of the tree. As the tree is cut, the cable is tightened until finally the tree is actually pulled over, its fall controlled by the cable. The "pulled" tree falls uphill and thus falls a shorter distance than one which falls downhill. The impact is considerably less. Tree pulling is expensive but some loggers are convinced that it is justified both in terms of wood saved (pulled trees are not shattered by the impact of the fall nor do they have badly broken tops) and in terms of lessened damage to the ground below.

After the trees are felled and bucked, they must be yarded. * * * Today, in most operations, logs are yarded uphill by tough steel cables to roads located along the ridge tops.

The advantages of this system are many. Pulled logs damage the soil less than do wildly sliding ones. * * * Most important, pulling logs uphill means that roads can be kept far from streambeds and other sensitive areas, making it truly practical to leave and maintain protective buffer strips."

Horwitz, *supra* note 142, at 27-29.

to regenerate the desired species, with or without artificial assistance. The major factors determining the successful regeneration of the forest include: (1) the availability of seed sources, (2) the shade tolerance of the desired species, and (3) resistance to environmental stresses and disease.

Seed Sources

With either selection cutting or clearcutting, the forester is faced with a choice between natural and artificial regeneration of the stand. The selection system usually depends on the remaining trees for a source of seeds. This, however, is not without problems. With the selection cutting process, the healthy merchantable timber is usually cut leaving only unhealthy or undesirable species behind to reproduce the forest. This practice, known as highgrading, has removed many prime species such as black walnut and cherry from the forests.¹⁵⁶

With clearcutting, the regeneration method is determined by the type of tree harvested. In coniferous forests, clearcutting is usually followed by planting seedlings or seeding by artificial means. This results in higher costs for regeneration than with natural methods. Natural regeneration is possible with coniferous species that are consistently prolific seed producers. Hardwood forests are usually regenerated naturally as these trees have abundant annual seed crops.¹⁵⁷

With some coniferous species seed release is not obtained unless the cones are exposed to high temperatures. This characteristic is known as serotinous cones. Removal of the forest cover results in increased temperatures at and near the soil which are sufficient for the release of seeds from the cones of jack pine¹⁵⁸ and lodge pole pine.¹⁵⁹ Surface temperatures would be insufficient to insure seed release when selection cutting is used.

To insure a healthy seed source of the desired species, clearcutting is at least as favorable as selection cutting. Clearcutting

156. *Id.* at 18.

157. Hermann & Lavender, *Introduction*, in *EVEN-AGE MANAGEMENT* 31 (R. Hermann & D. Lavender eds. 1973) (copies of this publication are available from School of Forestry, Oregon State University, Corvallis, Oregon 97331) [hereinafter cited as *EVEN-AGE MANAGEMENT*].

158. Ward, *supra* note 143, at 69.

159. *Church Hearings*, *supra* note 97, at 929.

may be more desirable where highgrading has been practiced or serotinous conifers are the desired species.

Shade Tolerance

Trees which are classified as intolerant grow poorly, if at all, in the shade of a heavy forest canopy. Some of the most attractive and useful trees in the forest are intolerant and require the large sunny openings presented by clearcuts to reproduce healthy stands.¹⁶⁰

The important species from commercial and aesthetic stand-points which are intolerant include: yellow-poplar, black cherry, red oak, western larch,¹⁶¹ southern pine, Atlantic white cedar, sweetgum,¹⁶² black walnut, cottonwood, white birch, paper birch, Douglas fir, lodgepole pine, jack pine, red pine,¹⁶³ trembling aspen, and largetooth aspen.¹⁶⁴ These species grow and reproduce only in full sunlight. In the natural course of events, they seed in after a fire, windstorm or disease has opened a large area to the sun. We cannot afford though to let these natural disasters take their toll and waste our forest resources. Modern forest management techniques control or remove disease, regulate stand density to prevent wind blowdown and limit fire losses. Even-aged management, accomplished principally by clearcutting, simulates these natural disasters in a controlled and orderly manner.¹⁶⁵

Selection cutting is not an adequate harvest technique with the above species, but it was the preferred system until the early 1960's.

Up to this time, cutting had been largely for stand improvement because the timber stands were too young for harvesting. However, as stands began to mature and timber harvesting began to take place, strong doubts arose as to the effects of selection cutting on the regeneration of a new crop of trees.

Dissatisfaction with selection cutting stemmed largely from in-

160. Horwitz, *supra* note 142, at 22-24.

161. *Church Hearings*, *supra* note 97, at 929, 931.

162. Maki, *Clearcutting and Soil Depletion*, *FOREST FARMER*, Oct. 1972, at 12.

163. Horwitz, *supra* note 142, at 24; James, *supra* note 151, at 49, 55, 57; Dils, *Clearcutting in the Hardwood Forests of the Rocky Mountains*, in *CLEARCUTTING: A VIEW FROM THE TOP* 108 (E. Horwitz ed. 1974).

164. Maini, *Silvics and Ecology in Canada*, in *ASPEN: SYMPOSIUM PROCEEDINGS* 67, 70, 71 (1972).

165. Horwitz, *supra* note 142, at 22, 24.

creasing awareness that this method would not reproduce the high-value shade-intolerant hardwoods, such as yellow-poplar, black cherry, and red oak. * * * Research studies showed that selection cutting meant that future forest stands would be composed largely of shade tolerant maples and beech.

For example, a study on the Fernow Experimental Forest in West Virginia showed that * * * [c]learcutting resulted in over seven times as many intolerant trees as was gotten with selection cutting. Selection cutting then would result in the gradual removal from the market many of our highly-prized fine hardwoods. Moreover, the tolerant maples and beech are slower growing and beech especially is of lower quality in this area.¹⁶⁶

Most species reproduce well following clearcutting,¹⁶⁷ and the resulting even-age systems are more efficient operationally because of the resulting practicality of area-wide cultural treatments. In addition, faster growth rates are obtained with even-age systems. Those two factors mandate the choice of an even-age system where wood production is the primary goal. Where other considerations become important the forest manager does have a choice.¹⁶⁸

The following species are shade tolerant and may be reproduced by selection cutting: sugar maple, red maple, beech, basswood, ash, hickory,¹⁶⁹ hemlock, and elm.¹⁷⁰ These trees should be selectively cut where poor site conditions, recreation interests, or aesthetics indicate clearcutting may be a poor choice.

For a few species, it is essential to use the selection method in regeneration under certain conditions. "Perhaps the outstanding example is virtually pure ponderosa pine found on sites subject to severe environmental stresses, particularly in moisture or temperature or both * * *."¹⁷¹

166. *Church Hearings*, *supra* note 97 at 931, 932.

167. For example, clearcutting in the central Appalachians. *Id.* at 932.

168. EVEN-AGE MANAGEMENT, *supra* note 157, at 34.

169. *Church Hearings*, *supra* note 97, at 931.

170. Horwitz, *supra* note 142, at 24; James, *supra* note 151, at 55.

171. EVEN-AGE MANAGEMENT, *supra* note 157, at 33. Continuing in a footnote, the author notes that selection cutting is not universally an essential requirement to ponderosa pine regeneration.

"The ponderosa pine forests found on less severe sites * * * are entirely different. These forests usually were created and maintained by fire, and selection forestry on these sites eventually will result in the elimination of the pine. This points out the danger of generalizing about an appropriate cutting method for a widespread and variable 'forest type' such as ponderosa pine * * *."

Id. at n.2.

For those species which require clearcutting the next consideration is what size to make the opening, and what shape. The authorities are in agreement that the minimum size is set by the biological constraint of adequate sunlight. This size seems to be one-quarter acre. The maximum size seems to depend on considerations other than regeneration: for instance streamflows, effects on wildlife, economics of logging, and the "edge" effects.¹⁷² Edge effects are generally a retardation of growth of the new seedlings at the edges of the cutting. Therefore it is desirable to minimize the edge per unit area. This would indicate circular shapes and larger sizes. Another problem associated with edges is epicormic branching. Epicormic branches arise from a selection of clear, unknotted timber. Profuse epicormic branching occurs at the edges of clearcuts in oak-hickory stands. This lowers the quality of the logs. It is desirable in this case also to minimize the perimeter-area ratio.¹⁷³

Environmental Stresses

The principal environmental stresses a stand of timber is subject to are fire, disease, and wind blowdown. Fire affects the even-age stand and the uneven-age stand equally in destroying it, but there are differences in the susceptibility of each to fire. If the stand becomes damaged by overmaturity, disease or blowdown, the debris creates a fire hazard. Further, logging slash may be difficult or expensive to dispose of without prescribed burning. Many southern pines are periodically burned to reduce the fire hazard, and this could not be done with selection cutting as any fire would destroy the new growth. Following clearcutting, however, burning of slash may be done to limit fire hazards.¹⁷⁴

Effective disease control is often only available by clearcutting the infected trees. "Where dwarf mistletoe disease is serious, a healthy new stand can be grown only by removing all the diseased older stand at the time the forest is regenerated. Insect infestations sometimes require the removal of all infested trees."¹⁷⁵ Clearcut-

172. *Id.* at 35. See also *Church Hearings*, *supra* note 97, at 932.

173. James, *supra* note 151, at 54.

174. *Church Hearings*, *supra* note 97, at 814, 815, 816, 929, 930.

175. *Id.* at 814, species subject to severe damage due to dwarf mistletoe include: Douglas fir, ponderosa pine, lodgepole pine, western larch, *id.* at 928-29, and western hemlock, Bethel, *Clearcutting in the Pacific Northwest and Alaska* in CLEARCUTTING: A VIEW FROM THE TOP 132 (E. Horwitz ed. 1974). Other diseases controlled by clearcutting include blister ruse, heart rot and butt rot on western

ting not only removes the source of the disease; it also allows for the regeneration of genetically improved species that are pest resistant.

A further threat to some species is excessive blowdown if the stand is thinned by selection cutting. The softwooded trees often have weak root systems or grow in a moist environment thus making them susceptible to blowdown if not densely grown. Douglas fir, jack pine, swamp conifers, spruce-fir types,¹⁷⁶ and lodgepole pine¹⁷⁷ are particularly prone to severe wind damage when thinned.

In light of the problems of reproduction and growth experienced by many commercially and aesthetically valuable species when harvested by methods other than clearcutting, it is imperative that clearcutting be retained as a tool of professional forest management.

Nutrient Cycling

Nutrients in the forest ecosystem may be lost following clearcutting through the removal of logs, the physical erosion of the soil, or the chemical leaching of water soluble ions from the soil and their transportation by the increased water yield. About two-thirds of the nutrients contained in the trees are in the roots, leaves, and branches which are left behind and form one important source of nutrients for the regenerating forest.¹⁷⁸ Physical erosion of the soil can result from improperly designed logging roads and poor logging techniques.¹⁷⁹ There are more water soluble nutrients in the soil following clearcutting, due to the increased decomposition rate resulting from increased soil temperatures.¹⁸⁰ These additional nutrients may be carried away in the increased water yield.¹⁸¹

In recent years a wave of concern has been mounting over the

white pine; heart rot in Engelmann spruce and subalpine firs, see *Church Hearings*, *supra* note 97, at 930; hypoxylon canker in aspen, James, *supra* note 163, at 57. Insect pests such as bark beetle in lodgepole pine and western white pine, spruce budworm and Engelmann spruce beetle in Engelmann spruce are controlled by clearcutting the diseased trees. *Church Hearings*, *supra* note 97, at 930.

176. James, *supra* note 151, at 36, 49, 51, 52; Dils, *supra* note 163, at 109.

177. *Church Hearings*, *supra* note 97, at 929.

178. Horwitz, *supra* note 142, at 27; James, *supra* note 151, at 48, 49.

179. See text accompanying notes 141, 142 *supra*.

180. Ward, *supra* note 143, at 67-68.

181. See text accompanying note 145 *supra*.

destruction of our forests' soil. Robert Curry,¹⁸² speaking at the Church Hearings,¹⁸³ stated that as a result of erosion losses and severe nutrient leaching,

[w]estern forests may have something less than 200 years of productive fertility remaining before permanent (in the sense of man's remaining timescale on earth) eradication of productivity for saw timber production.¹⁸⁴

Curry bases his argument on extremely high erosion rates measured in some logging areas and the inability for the soil to reproduce the constituents necessary for a fertile soil.¹⁸⁵ He also placed great emphasis on the Hubbard Brook Study¹⁸⁶ with regard to nutrient depletion.¹⁸⁷

Curry's alarm finds little support in the professional community. In a report prepared for the Council on Environmental Quality, Lee James¹⁸⁸ responded to Curry's "wolf."

182. Professor of Environment Geology, University of Montana.

183. *Church Hearings*, *supra* note 97, at 164.

184. *Id.* at 173.

185. *Id.* at 168.

186. In the interest of determining the rate of water transpiration, six watersheds at the Hubbard Brook Experimental Forest in New Hampshire were clear-cut in December of 1965.

"In the spring when non-woody plants and young shoots began to grow again, it became apparent that it would be necessary to eliminate them. To that end the entire experimental area was sprayed with a powerful herbicide. Soon the remnants of ground cover were dead; and the shoots had withered. Each summer throughout the experiment period—1966, 1967, 1968—the area had to be defoliated to prevent regrowth. With the vegetation successfully eliminated it was possible to measure streamflow and water quality and to observe what would happen without the forest on that particular hillside.

* * *

"* * * Nutrients were released from the rotting vegetation and, as there were no plants remaining to utilize these nutrients, they were washed away into the stream and carried out of the watershed. * * * [M]ajor nutrients such as calcium, potassium, sodium, and magnesium were found at concentrations 3 to 20 times their normal levels.

"Annual sediment losses * * * were about 9 times the normal losses.

* * *

"* * * Eight years after this super devastating 'clearcut' - which was not an experiment in forest practice but in hydrology - Hubbard Brook forest is virtually back to normal."

Horowitz, *Hubbard Brook Revisited*, In *CLEARCUTTING: A VIEW FROM THE TOP* 151-55 (E. Horwitz ed. 1974).

187. *Church Hearings*, *supra* note 97, at 170.

188. Chairman of the Department of Forestry, Michigan State University.

The more significant nutrient losses caused by logging are likely to be losses from the forest floor and soil rather than in wood removed. * * * Losses increase with the size of opening; they are greater under clearcutting than any other cutting method * * *. Nevertheless, in all studies completed to date, with the exception of Hubbard Brook which is inapplicable to a normal appraisal of logging, nutrient losses do not appear large in relation to the supply of nutrients from the forest floor and soil and the additions to nutrient supplies by natural processes in the forest.¹⁸⁹

A study subsequent to Hubbard Brook in north central New Hampshire of several clearcut areas which were not subjected to the defoliation procedures at Hubbard Brook yielded more encouraging results.

Erosional and nutrient element losses from a forest ecosystem following disturbance are diminished by any form of vegetative regeneration, there being a roughly inverse relationship between the rate of regeneration and the amounts of erosional and nutrient losses. * * * Dense stands of fast-growing, successional species will exhibit pronounced regulation of ecosystem function soon after disturbance, the net effect of which is to move the ecosystem rapidly back toward the steady-state, stable pattern of nutrient circulation that typifies the mature forest.¹⁹⁰

189. FORESTRY ISSUES, *supra* note 102, at 33. See also *Church Hearings*, *supra* note 97, at 729, 748; EVEN-AGE MANAGEMENT, *supra* note 157, at 179, 187, 188, 195.

190. Marks & Borman, *Revegetation Following Forest Cutting: Mechanisms for Return to Steady-State Nutrient Cycling*, 176 Sci. 914, 915 (1972). The authors state that in these studies the pin cherry showed remarkable qualities.

"It is likely that the high rates of nutrient uptake and growth result from an adaptive capacity of this species to utilize the greater availability of water and nutrients on disturbed sites * * *. [F]ollowing severe disturbance such as clear-cutting, the growth and development of dense stands of successional species such as pin cherry may be extremely rapid. Such growth acts to minimize nutrient losses from the ecosystem. This regulation of nutrient cycling is achieved soon after disturbance by a complex interaction involving (i) channeling of water from runoff to evapotranspiration, thereby reducing erosion and nutrient loss; (ii) reduction in rates of decomposition through moderation of the microclimate during the growing season, so that the supply of soluble ions available for loss in drainage water is reduced; and (iii) simultaneous incorporation into the rapidly developing biomass of nutrients that do become available and that otherwise might be lost from the system * * *. [I]ndeed the design of the life cycle of pin cherry, particularly the storage in soil, longevity, and germination requirements of its seeds, assures that its occurrence is geared closely into the pattern of disturbance in the large system."

Id. at 915.

In light of the present evidence on nutrient depletion, it appears that these potential losses should be considered in determining the upper limit on clearing size. It does not appear, however, that nutrient losses are sufficient to require the elimination of clearcutting as a silvicultural tool.

Wildlife

Generally, the diversity and abundance of animals in any given unit of forest is directly related to habitat diversity and abundance at that time.¹⁹¹

Clearcutting effects on fish, large game animals, and birds will be considered.

Fish

Clearcutting that uncovers streams will cause a temperature rise in the water. Cutthroat trout are affected by a significant rise in water temperature. If prolonged temperatures of more than 68° F. occur, the trout will most likely leave the stream. Salmon show no unusual mortality as a result of clearcutting.¹⁹²

Fish and all other aquatic life will benefit from increased stream flows. The increased flow is especially beneficial as the major rise occurs in the summer and early fall months when flow would normally be very low.¹⁹³

Increased stream sedimentation, which accompanies improperly planned logging roads, may have adverse effects on fish. The settling sediments cover bottom fauna and trout eggs. If the stream temperature also rises, increased decomposition takes place reducing the supply of oxygen available in the water both to fish and fish eggs. These effects can be minimized by proper planning of logging roads and removal procedures. Roads and clearcuts should be kept away from streams and erosion control measures mentioned above followed.¹⁹⁴

191. Pengelly, *Clearcutting: Detrimental Aspects for Wildlife Resources*, 27 J. SOIL & WATER CONSERVATION 255, 256 (1972).

192. Hoover, *A Wildlife Brief for the Clearcut Logging of Douglas Fir*, 71 J. FORESTRY 211, 212 (1973). See also James, *supra* note 151, at 47.

193. Hoover, *supra* note 192, at 211. See generally CLEARCUTTING: A VIEW FROM THE TOP (E. Horwitz ed. 1974).

194. James, *supra* note 151, at 54; Dils, *supra* note 163, at 114; Bethel, *supra* note 175, at 135, 137.

Large Game Animals

As revegetation of clearcut areas takes place, deer and elk benefit by the increased forage. Not only is the supply of food increased, but its nutritional value is also improved. Especially following such clean-up procedures as broadcast burning, the regrowth will be high in protein, calcium, potash, phosphorus and other essential nutrients. Noticeable increases result in body size, antler size, and reproductive rate of the animals feeding in clearcuts. Decreases in disease are also evident.¹⁹⁵

The openings provide edges which are beneficial to big game. To maximize edges, size should be kept down, which also works to keep the safety of cover nearby while the game feeds in the opening. It appears that strip cuts of 75 feet in width are the best in that they provide large amounts of edge, minimize increased wind velocity, and limit snow accumulation. The heavy accumulation of snow can have a deleterious effect on deer, reducing their use of the opening.¹⁹⁶

Birds

Within three years following a clearcut, the bird population in that area will include more species with greater numbers of each than prior to the cut. The birds are attracted by the edge effect and the variety of vegetation growing in the opening. Juncos, varied thrushes, spotted towhees, mountain quail, golden crowned sparrows and fox sparrows benefit the most from logging due to the increased seed supplies. While some species, such as Steller's jay, leave clearings initially, they return in greater numbers when vegetation reaches the brush stage.¹⁹⁷ Habitats suitable for other species such as ruffed grouse and Kirtland's warbler are only attainable through use of properly sized and located clearcuts.¹⁹⁸

By exercising the same constraints as required to preserve the watershed and nutrient values of the cut forest, substantial benefits to wildlife may be obtained while avoiding the possible detriments. Increased supplies of more nutritional food become avail-

195. Resler, *Clearcutting: Beneficial Aspects for Wildlife Resources*, 27 J. SOIL & WATER CONSERVATION 250, 251-52 (1972); Hoover, *supra* note 192, at 213.

196. Resler, *supra* note 195, at 252; Hoover, *supra* note 192, at 212; Pengally, *supra* note 191, at 256-57. See also EVEN-AGE MANAGEMENT, *supra* note 157, at 59.

197. Resler, *supra* note 195, at 253-54.

198. *Id.* at 254; James, *supra* note 151, at 50.

able to support healthier inhabitants. The additional variety in the environment provided by openings, supports a corresponding increase in the variety of species present. Wildlife interests are, however, one of the constraints on the maximum size of clearcuts.

Recreation

It is generally accepted that clearcutting and recreation are mutually exclusive, but this is a shortsighted oversimplification. There are many forms of recreation which are enhanced by clearcutting applied with the proper constraints dictated by the other issues discussed above. Skiers require clearcutting to open up their trails. At first glance, hikers and wilderness users would seem to require the absence of all cutting or at most, selection cutting. But in light of the increased variety and numbers of wildlife mentioned above, perhaps occasional clearcuts might be of more interest. Further, the more varied vegetation of clearings, including wildflowers and berries may provide a much appreciated diversion from continuous forest. The appearance of clearings from a distance is aesthetic disaster if indiscriminate checkerboard cuts are used, but well-designed and located openings could add additional color and textural dimension to a landscape. Clearcut openings can also provide scenic overlooks on horseback or cross-country skiing trails.

The road system, a constant problem with any logging scheme, has a definite impact on recreational use. For the motorist who wishes to pleasure drive through the forest, selection logging may be preferable because of its extensive, permanent road system. For the backpacker, clearcutting with adequate restraints may be better because more primitive roads and fewer miles of them are used. The result is a return to the wilderness environment sooner. Further, with selection logging a given area will theoretically be logged each year, while with clearcutting the same area would go undisturbed for fifty to seventy-five years more.

As with the other areas, clearcutting impacts on recreation do not rule out this silvicultural technique, they merely place constraints on its use. These constraints seem to be relatively the same as seen above: limit size and shape so as to compliment surroundings, and limit spacing.

The Economics of Logging

The selection system of timber harvesting requires a more

expensive road system for at least two reasons. First, because larger areas of forest must be logged to supply the same quantity of timber, more miles of road are required. Second, since these areas are logged each year, the roads need to be of higher quality to last year after year.¹⁹⁹ In addition, the harvest will take more time since trees will have to be dropped more precisely to keep damage to the remaining stand at a minimum. More men will be needed to mark the trees to be cut. Selection cutting is more expensive initially.²⁰⁰

As discussed above,²⁰¹ many of the commercially valuable species will only reproduce in full sunlight. A ban on clearcutting will result in a gradual shift away from these species to less acceptable varieties. To obtain the desirable trees, foresters would be forced to depend on natural disturbances to open up areas for their growth. In light of our present fire control policies, the supply of commercial timber would very likely be insufficient.²⁰² Further, even in species amenable to selection management, the sustained yield is lower with uneven-age forestry than with even-age forestry.²⁰³

With constant or increasing demand, decreasing supply and increasing costs per unit of timber, it is apparent that the overall effect of eliminating clearcutting on the timber industry will be to drive prices higher. And these prices will be higher for commercially inferior trees. Wood products are of such wide utilization that the elimination of clearcutting will undoubtedly increase costs throughout the economy.²⁰⁴

There have been abuses of clearcutting which have severely damaged the environment.²⁰⁵ However, clearcutting under the proper circumstances can be beneficial to the local environment. By proper construction and placement of road systems and using ecologically sound logging procedures, a watershed's yield will be in-

199. Horwitz, *supra* note 142, at 21; Gould, *supra* note 22, at 161.

200. James, *supra* note 151, at 45-46; Gould, *supra* note 22, at 161.

201. See the text accompanying notes 171-73 *supra*.

202. Horwitz, *supra* note 142, at 18, 24.

203. Morgan, *The Economics of Intensifying Forest Management*, FOREST FARMER, July-Aug. 1973, at 6, 18.

204. Gould, *supra* note 22, at 163.

205. See, e.g., the problems incurred by clearcutting in the Bitterroot National Forest that are documented in UNIVERSITY OF MONTANA, A UNIVERSITY VIEW OF THE FOREST SERVICE, S. Doc. No. 91-115, 91st Cong., 2d Sess. (Senate Comm. on Interior and Insular Affairs 1970).

creased, the water quality maintained, and excessive nutrient losses prevented. Clearcutting in species that require full sunlight for regeneration will insure their continued availability. Removing diseased trees will permit the regeneration of disease-free seedlings. Careful planning of the size, shape and location of openings will increase the variety of the wildlife present, increase the variety of food available to the wildlife, improve the quality of the food supply, and limit the aesthetic damage. Restrictions such as those recommended in the Church Hearings²⁰⁶ must be placed on the use of clearcutting to accomplish these results. This harvest technique must remain available to insure the best possible forest management program.

CONCLUSION

Izaak Walton League presented a complex issue: were the clearcutting procedures proposed by the Forest Service for the three timber sales involved in violation of the purpose Congress exemplified in the Organic Act? The court avoided the issue, and at the same time a meaningful result, by resorting to the discredited "plain meaning" doctrine of statutory construction. The court made no attempt to determine Congressional intent. Had this issue been addressed, the court would have been required to look at the legislative and administrative histories of the Act as well as other related legislation. The conclusion drawn from such an examination is that Congress provided for the well-planned, scientific management of the national forests to maintain a continuous supply of timber.

The court states that the general purpose of an act should not dominate the specific requirements of isolated sections.²⁰⁷ Again the court adopted the wrong rule. It is well established that the general purpose of a statute is the most important and the act as a whole dominates isolated language. The court must construe details in conformity with the dominating general purpose.²⁰⁸

To determine whether clearcutting the areas proposed in the three sales involved was incongruous with the sound management of the Monongahela National Forest, the court should have consid-

206. *Church Hearings*, at 9.

207. 367 F. Supp. at 429.

208. See *United States v. Shirey*, 359 U.S. 255, 260-61 (1959) and *Elizabeth Arden Sales Corp. v. Gus Blass Co.*, 150 F.2d 988, 992-93 (8th Cir. 1945).

ered the specific facts involved in the stands to be cleared. There appears to have been no consideration of the type of trees to be cut, whether they could regenerate in the shade of the overstory, whether they were healthy or diseased, how wildlife in the area would be affected, what logging procedures were to be used, how and where roads were to be constructed, what size and shape limitations were proposed for the clearings, or what recreational use was presently being made of the area.

Our society and its governmental instrumentalities, having been less than alert to the needs of our environment for generations, have now taken protective steps. These developments, however praiseworthy, should not lead courts to exercise equitable powers loosely or casually whenever a claim of "environmental damage" is asserted. * * * The decisional process for judges is one of balancing and it is often a most difficult task.²⁰⁹

The court balanced nothing in this case. Neither the interests of the plaintiffs nor the interests sought to be protected by the Act and the Forest Service were considered. There was no examination of the impact of clearcutting in the areas involved. Hopefully the case will be remanded for a new trial to determine these important issues by examining the forest rather than the trees. Then perhaps the decision will go to the protection of the forest rather than the ability to use a modern dictionary to discern what Congress intended seventy-seven years ago when the Organic Act was passed.

209. *Aberdeen & Rockfish Ry. v. Students Challenging Regulatory Agency Procedures (SCRAP)*, 409 U.S. 1207, 1217-18 (1972). See also Westell, *Dangers of Ecology Scare Tactics*, *FOREST FARMER*, June 1972, at 9.