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BENEFIT/COST ANALYSIS OF SILVEX CANCELLATION. UNIT DAY VALUE ME--ETC(U)  
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Whereas the present system of analysis by the Environmental Protection Agency in the Rebutable Presumption Against Reregistration (APAR) of silvex, defines the conditions that change the cost of agricultural production as benefits, the basic truth is that elimination of a herbicide such as silvex, has costs beyond and above the costs to agriculture. The system of analysis should consider all benefits to the nation, particularly in a time of economic stress. It is the total economy of the nation that must be taken into account. The conclusions from such an analysis could certainly change the decision on eliminating a herbicide.

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BENEFIT/COST ANALYSIS OF SILVEX CANCELLATION  
UNIT DAY VALUE METHOD

The Unit Day Value (UDV) method for estimating benefits at Federal or Federally assisted recreation resources (1) may be used by applying a carefully thought-out and adjusted unit day value to estimated use. This approximation may be used as an estimate of project recreation benefits. (1).

Implementation

(1) When the UDV method is used for economic evaluations, planners will select a specific value from the range of values provided in the most current published schedule. Application of the selected value to estimated annual use over the project life, in the context of the with-and-without-project framework of analysis, provides the estimate of recreation benefits.

(2) Two categories of outdoor recreation days, general and specialized, may be differentiated for evaluation purposes. "General" refers to a recreation day involving primarily those activities that are attractive to the majority of outdoor users and that generally require the development and maintenance of convenient access and adequate facilities. "Specialized" refers to a recreation day involving those activities for which opportunities in general are limited, intensity of use is low, and a high degree of skill, knowledge, and appreciation of the activity by the user is involved.

(3) Estimates of total recreation days of use for both categories, where applicable, will be developed. The general category comprises the great majority of all recreation activities associated with water projects, including swimming, picnicking, boating, and most warm water fishing. Activities less often associated with water projects, such as big game hunting and salmon fishing, are included in the specialized category. A separate range of values is provided for each category to facilitate adoption of a point system in determining the applicable unit values for each individual project.

#### AREAS OF ASSESSMENT

##### Navigation

The River and Harbor Act of 1899 provided for the initiation of a program for the removal of water hyacinth from navigable waterways insofar as it constituted an obstruction to navigation and commerce.<sup>(2)</sup> Without such maintenance water hyacinth and other aquatic plants may grow sufficiently dense to block or impede boat traffic, damage propellers, and marine cooling systems, and increase navigation hazards in the vicinity of bridges, docks, piers, etc. Alligatorweed is also particularly difficult for boats to move through. The dense above water foliage is supported on thick underwater mats composed of the stems and laterals of the plants. Without control of aquatics, commercial navigation would cease to exist after a few years in many streams.

### Recreation

Water areas clogged with aquatics directly prevent or reduce use of recreational resources and facilities in areas infested and also indirectly by denying access to adjoining areas less affected. The weeds harbor snakes and insects and accumulate unsightly trash and debris.

### Flood Control and Drainage (Urban)

Benefits from removal of blockages from streams and drainage canals are very real and of particular significance in areas of flat slopes and shallow channels. Aquatic plant infestations can reduce discharge capacities as much as sixty percent in areas with floating mats and up to ninety percent by submersed weeds.

### Water and Flood Control (Agriculture)

Aquatic plants cause serious losses to agriculture by obstructing the flow of water in drainage and irrigation canals, farm ditches, and streams. They waste water by transpiration and interfere with the use of water for irrigation and other farm uses.

### Fish and Wildlife

Some of the greatest benefits from control of aquatic plants are those affecting fish and wildlife. The annual benefits are based on creation of open waters and improved access to new and existing open waters for sport fishing, commercial fishing, and hunting.

### Public Health

From a health aspect, water weed control is vital to insure a potable water supply for those drawing water for drinking purposes. Removal of dense aquatic weed growths insure proper lake water circulation to inhibit coliform buildup around bathing areas and minimize mosquito breeding in shallow zones is a real consideration.

### Cancellation of Silvex

On February 28, 1979 the Administrator of the Environmental Protection Agency (EPA) ordered the emergency suspension of the use of two phenoxy herbicides, 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) and 2-(2,4,5-trichlorophenoxy) propionic acid (silvex) on forests, rights-of-way and pastures, and the home and garden, aquatic ditch bank/weed control, and commercial/ornamental turf uses of silvex (suspended uses). (44 FR 15897, March 15, 1979).

The emergency suspension orders were based in part on data and information developed for and through the agency's rebuttable presumption against registration (RPAR) for pesticide products containing one of these chemicals, 2,4,5,-T(43 FR 17166, April 21, 1978). Silvex was included in the suspension orders in part because 2,4,5,-T and silvex both contain the contaminant 2,3,7,8-tetrachlorodibenzop-dioxin (TCDD), a highly toxic chemical, have comparable uses and correspondingly comparable exposure potential, and pose risk concerns which are similar in many ways.

Assessment teams under a cooperative agreement between the U.S. Department of Agriculture and the Environmental Protection Agency, commonly evaluate the biologic and economic impacts of the RPAR process for presentation to the court for judicial review. For purposes of the review, however, the argument is presented that this narrow assessment is patently inadequate because cancellation in a water resource activity involves many different areas and the impact is certainly not limited to agriculture. (3,4).

#### PROGRAMS OF CONTROL

##### Submersed Aquatic Weed Control

A summary of the total acreage, acres controlled and the swimming, fishing and boating days for the Pennsylvania State Park system is given in table 1, for 1972 for a total of 29,416 acres in 22 lakes. Benefits from the weed control operations are estimated @ \$107 per acre for swimming, \$100 per acre for fishing and \$73 per acre for boating. Extrapolating from the basis of 20,000 acres controlled in the United States with silvex (Aquathol Plus<sup>R</sup>), the recreation benefits as presented in table 2 are \$5,619,600. The total cost of application @ \$85 per acre is \$1,700,000, and the B/C ratio is 3.3 to 1.

##### Marginal-Herbaceous Weed Control

Benefits for marginal-herbaceous weed control from different sources vary widely with geographic locality according to particular conditions. They are summarized in table 12, as the

overall average of the United States for navigation benefits (\$7,029,800), are estimated at 25% of the operating cost of river and barge traffic for the acres controlled. Public health benefits (\$5,183,100) are the estimated level of cash savings for public health, water supply and pollution control for the acres controlled. Agricultural benefits (\$4,861,937) are the estimated value at 2 percent of the cost of farm products sold in the area of control. Recreation benefits (\$4,099,019) are estimated at \$0.50 per visitor day in the area of weeds controlled. Fish and wildlife benefits (\$2,395,700) are estimated at \$0.50 per fishing day, \$1.15 per day for small game hunting and \$2.50 per day for large game hunting. Other benefits are estimated at \$5,460,000 for a total of \$28,969,556 and a cost of application @ \$70.00 per acre or \$1,400,592, the benefit/cost ration of 20.1 to 1.

#### Marginal-Woody Plants

Benefits from different sources relating to control of marginal-woody plants vary with specific conditions application. The related values for the estimated use in the United States are also given in table 2. Fish and wildlife benefits are estimated at \$1,663,760, using a special day value of 11.50 for fishing and 12.20 for hunting. Flood control benefits are estimated at \$674,000 and agricultural benefits at \$119,600. Other benefits outside the saltcedar area are estimated at \$2,540,960 for a total of \$5,441,920 benefits and a benefit/cost ratio of 12.7 to 1.

### Sum Total Benefits

The overall benefits that are apparent from this brief analysis total to more than 40 million dollars. The cost of this program is approximately 3.5 million dollars. Thus the overall benefit/cost ratio is approximately 11 to 1.

### SUMMARY AND CONCLUSIONS

Whereas the present system of analysis by the Environmental Protection Agency in the Rebutable Presumption Against Reregistration (APAR) of silvex, defines the conditions that charge the cost of agricultural production as benefits, the basic truth is that elimination of a herbicide such as silvex, has costs beyond and above the costs to agriculture. The system of analysis should consider all benefits to the nation, particularly in a time of economic stress. It is the total economy of the nation that must be taken into account. The conclusions from such an analysis could certainly change the decision on eliminating a herbicide.

#### REFERENCES

1. Water Resources Council. Procedures for Evaluation of National Economic Development (NED) Benefits and Cost in Water Resources Planning, Fed. Reg. 44, NO242, Dec. 14, 1979. Appendix 3 to Subpart K, Unit Day Value Method. 1979.
2. Expanded Project for Aquatic Plants Control, House Document No. 251, U.S. Government Printing Office. Washington, D.C. 1965.
3. Preliminary Determination Concerning a Rebuttable Presumption against Registration of Pesticide Products containing 2-(2,4,5-Trichlorophenoxy) Propionic acid (Silvex) Fed. Reg. 44 No. 138. July 17, 1979. Availability of Position Document. 1979.
4. Weed Science Society of America. Herbicide Handbook. Fourth Ed. 402-406. Weed Science Society of America. Champaign, Ill. 1979.

TABLE 1

Summary of Total Acreage, Acres Controlled and Swimming,  
Fishing and Boating Days for Pennsylvania State Parks Lakes for 1972

State Park	Total Lake Acreage	Lake Acre. Treated 1972	No. Swim.		No. Fish.		No. Boat.	
			Rec. Days 1972	Rec. Days 1972	Rec. Days 1972	Rec. Days 1972		
Black Moshannon	250	75	29,405	18,207	13,927			
Bald Eagle	1,730	---	---	9,523	18,207			
Codorus	1,275	100	---	96,102	69,415			
Frances Slocum	165	---	---	8,721	3,308			
Gifford Pinchot	340	110	173,315	55,144	44,437			
Gouldsboro	255	15	65,005	6,445	12,850			
Hills Creek	137	50	37,150	16,283	10,382			
Kettle Creek	160	---	1,729	14,835	5,855			
Little Pine	90	---	2,406	5,485	1,512			
Lyman Run	40	10	14,865	4,026	1,362			
M. K. Goddard	1,860	50	---	8,725	18,031			
Moraine	3,200	100	261,151	212,151	226,884			
Poe Valley	25	---	67,899	16,302	9,736			
Prince Gallitzin	1,640	2	219,283	24,545	36,955			
Promised Land	595	---	122,585	143,335	139,680			
Pymatuning	16,420	400	118,152	197,386	99,547			
R. B. Winter	7	---	24,839	14,513	---			
Ricketts Glen	254	---	14,699	18,145	16,500			
Ryerson Station	61	15	30,260	85,409	11,605			
Shawnee	451	75	143,591	26,194	27,922			
Tobyhanna	170	100	49,560	5,775	11,110			
Roosevelt	291	45	---	31,640	156,685			
<b>TOTALS</b>	<b>29,416</b>	<b>1,147</b>	<b>1,375,894</b>	<b>1,019,657</b>	<b>935,910</b>			

Value of swimming days @ \$2.30 per day is \$3,164,558.

Value of fishing days @ \$2.50 per day is \$2,949,140.

Value of boating days @ \$2.30 per day is \$2,152,593.

Table 2. Benefit/Cost Analysis of Aquatic Weed Control with Silvex.

Item	Benefit	B/C Ratio
<u>Submersed Aquatic Plants</u>		
Recreation	\$3,614,600	
Fish & Wildlife	2,005,000	
Total	\$ 5,619,600	
Costs	1,700,000	3.3
<u>Marginal-Herbaceous Plants</u>		
Navigation	7,029,800	
Public Health	5,183,100	
Agriculture	4,861,937	
Recreation	4,099,019	
Fish & Wildlife	2,395,556	
Other a	5,460,000	
Total	28,969,556	
Costs	1,440,592	20.1
<u>Marginal Woody</u>		
Fish & Wildlife	1,663,760	
Flood Control	674,000	
Agriculture	119,600	
Recreation	83,600	
Other b	2,540,960	
Total	5,441,920	
Costs	440,000	12.4
Sum Total-Benefits	\$40,031,076	
Sum Total-Costs	3,580,592	11.2

a Marginal-Herbaceous plants other than alligator weed.

b Marginal-Woody plants other than salt cedar.

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