

U.S. Fish and Wildlife Service

The Impacts of Atlantic Salmon Restoration on Businesses in the Westfield River Basin

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**For more information about the Connecticut River Atlantic Salmon Restoration Program,
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Executive Summary

Businesses often have an economic interest in the health of the environment and can be an untapped source of support for natural resource management programs. Recent surveys of businesses in the upper Connecticut River watershed show support for clean water improvements, increases in the provision of fish ladders, and increases in habitat restoration and protection (Northeast Natural Resource Center, 1996 and 1997). Businesses in the Westfield River basin, Massachusetts, were surveyed to determine the level of support for the current Atlantic salmon restoration program. Almost all respondents (94%) agree that Atlantic salmon should be restored to the Westfield River basin. More than half (55%) think that the restoration program would or could possibly provide economic benefits for their business. Support for the program was also measured using contingent valuation methods, which establish a willingness to pay for non-use environmental values. Westfield River business owners expressed a willingness to pay \$14.47-18.94 per year for the salmon program. This amount is twice as much as the general New England population, whose willingness to pay for Atlantic salmon restoration has been measured at \$7.93 per year (Stevens, 1991).

Introduction

Public awareness and support for natural resource management programs can be important elements of success, helping to obtain legislative support, funding, and volunteer assistance. In the Connecticut River basin, anadromous fish biologists and managers have recognized the need for public support. One of the seven primary goals of the Atlantic salmon restoration program is to “create and maintain a public that understands and supports salmon restoration efforts and participates whenever possible,” (Strategic Plan, 1998).

Businesses often have a vested economic interest in the health of the environment, and can be an untapped source of support for natural resource management programs. Recent studies of the upper Connecticut River watershed show that most businesses support natural resource management efforts such as increasing fish passage at dams, enforcing minimum flow requirements, and improving water quality (Northeast Natural Resource Center, 1996, 1997). Furthermore, business owners are often active in their communities and local governments.

The University of Massachusetts, in cooperation with the U.S. Fish and Wildlife Service, conducted a survey of businesses in the Westfield River basin, Massachusetts, to determine the level of support for Atlantic salmon restoration. The primary objectives of the survey were to:

- Determine if businesses are aware of and support the restoration program.
- Determine if the restoration program could provide economic benefits to businesses.
- Establish a monetary value as a measure of program interest and support.

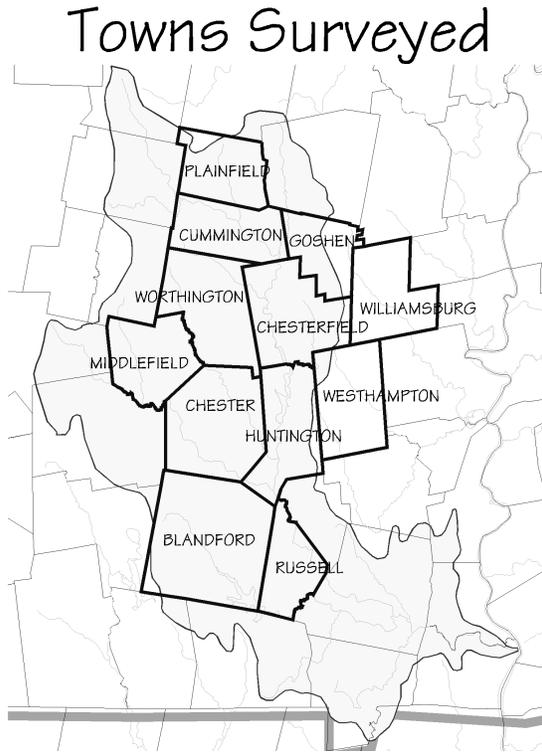
The Westfield River basin was chosen largely because of the interest generated by the release of wild adult sea-run Atlantic salmon into the upper mainstem for the last three years. For the first time in over 200 years, wild salmon are spawning naturally in the Westfield River, a unique occurrence in the Connecticut River drainage. The local attention and interest in the sea-run release program is also a result of outreach efforts by the Massachusetts Division of Fisheries and Wildlife and the Quebec Labrador Foundation.

Methods

A short survey was developed to strategically address the above objectives (Appendix A). A cover page gave background information on the Atlantic salmon restoration program and announced that a random respondent would receive a free fly fishing rod, an incentive for completing the survey. The intent and purpose of the upcoming survey was also advertised in a local newsletter to businesses.

The survey was mailed to 200 businesses listed in the Hilltown Community Development Corporation directory. Businesses were surveyed in 12 towns, most of which are entirely within the Westfield River basin. Two towns are considered to be outside the basin: Williamsburg,

which is entirely outside of the basin, and Westhampton, which has only a small corner inside the basin (see Figure 1).



It is important to note that in the Westfield River basin, there are more art and agriculture related businesses than in the rest of the Connecticut River watershed. 34% of all surveys were sent to art and agriculture businesses (17% for each type). However, in the rest of the Connecticut River watershed, less than 2% of all jobs are related to “Agriculture and Related,” and less than 1% are “Miscellaneous,” which would include art related businesses (Adams, *et. al.*, 1995).

Figure 1. Towns in which businesses were surveyed in relation to the Westfield River basin.

Results and Discussion

Forty-seven surveys were completed and returned. The response rate for towns inside the basin was 29%, close to the expected average response rate for surveys, which is about 30% (Adams, *et. al.*, 1995). The towns of Cummington, Middlefield, and Chester had above average response rates (36%, 40%, and 40%, respectively). The survey response rate for the two towns outside the basin was 8%.

The highest return rates by business type were Bed and Breakfasts (54%), Restaurant and Specialty Foods (44%), Business Management, Marketing, and Services (43%), Grocery markets and General Stores (40%), and Artists, Craftspeople, and Graphic Designers (39%). Low response rates were from Antiques, Gift Shops, and Galleries (12%), and Landscaping, Garden Supplies, and Tree Service (4%). No surveys were received from Clothing, Instruction, Livestock, Outdoor Power Equipment, Photographic and Video Stores, or Logging, Lumber and Firewood (see Table 1, below).

Business Type	# Sent	# Returned	Return Rate
Bed and Breakfast	13	7	54%
Restaurant and Specialty Foods	9	4	44%
Business Management, Marketing, and Services	14	6	43%
Grocery Markets and General Stores	5	2	40%
Artists, Craftspeople, and Graphic Designers	33	13	39%
Average Return Rate			29%
Cleaning Services and Rubbish Removal	4	1	25%
Recreation	4	1	25%
Animal Care, Veterinary, and Boarding Services	10	2	20%
Agricultural Products and Farm Supplies	31	6	19%
Environmental Services and Land Surveying	11	2	18%
Antiques, Gift Shops, and Galleries	17	2	12%
Landscaping, Garden Supplies, and Tree Service	24	1	4%
Clothing	3	0	0%
Instruction	13	0	0%
Livestock	2	0	0%
Logging, Lumber, and Firewood	4	0	0%
Outdoor Power Equipment	1	0	0%
Photographic and Video Stores	2	0	0%

Table 1. Survey return rate by business type.

Awareness and Support

A very high percentage of respondents (94%) agree to some degree that Atlantic salmon should be restored to the Westfield River basin. Of those who agree, 64% "strongly agree" that salmon should be restored (see Table 2, below). However, this figure may be biased. It is likely that those that do not care about Atlantic salmon restoration, or those who do not think it has impacted their business, did not take the time to complete the survey. In an economic analysis survey conducted for the Atlantic Salmon Restoration in New England EIS (Kay, 1987), researchers adjusted for this bias based on a follow-up survey. Applying the same adjustment (71%) to this survey would result in a more conservative, general estimate of 67% that agree that Atlantic salmon should be restored to the Westfield River basin.

	Strongly agree	Agree	Some-what agree	Neither agree or disagree	Disagree	Strongly disagree	(No answer)	Total responses
# Responses	30	10	4	0	0	0	1	24 (51%)
% Total	64%	21%	9%	0	0	0	2%	15 (32%)

Table 2. Levels of agreement with efforts to restore Atlantic to the Westfield River basin. **A high percentage (83%) of respondents were already aware of the efforts to restore**

Atlantic salmon in the Westfield River basin prior to this survey. This high level of awareness is probably due to the targeted outreach efforts of the Massachusetts Division of Fisheries and Wildlife and others to educate basin residents about the release of sea-run adults into the river. Somewhat fewer respondents (51%) were also aware of the efforts to restore other migratory fish (American shad, blueback herring, and striped bass) to the Connecticut River basin prior to this survey. Seventeen percent of all respondents were unaware of any migratory fish restoration efforts prior to this survey (see Table 3, below).

Aware of Atlantic salmon restoration?	Aware of migratory fish restoration?	% Respondents who strongly agree with ATS restoration	% Total respondents
yes	yes	83% (20/24)	51%
yes	no	53% (8/15)	32%
no	no	25% (2/8)	17%

Table 3. Percentage of respondents who strongly agree with restoring Atlantic salmon to the Westfield River basin compared with whether they were previously aware of the restoration program.

Respondents who were previously aware of migratory fish restoration agreed more strongly that Atlantic salmon should be restored to the Westfield River basin. Of those who were aware of both Atlantic salmon and other migratory fish restoration efforts, 83% strongly agreed that Atlantic salmon should be restored to the Westfield River basin. Of those who were aware of Atlantic salmon restoration, but unaware of the restoration of other migratory fishes, 53% strongly agreed that Atlantic salmon should be restored to the Westfield River basin. Of those who were unaware of the restoration of any migratory fishes, Atlantic salmon included, only 25% strongly agreed that Atlantic salmon should be restored to the Westfield River basin (see Table 3, above).

Almost a quarter of all respondents (23%) reported that they currently support the restoration, mostly by informing others of the program. Other forms of support include providing information pamphlets, supporting the program through participation in government, and volunteering.

There is also considerable potential for additional support from businesses. Most (74%) of the respondents are willing to be contacted again regarding the salmon program and their business. Eight business owners replied that they want to become more active in the program. These respondents wrote in ways in which they would support the program: by informing others, handing out brochures, volunteering to stock fry, and pursuing eco-tourism potential. One business offered to create migratory fish notecards and donate some of the profits to the program.

Benefits to Businesses

Businesses were asked the number of customers that came to their businesses in the last year as a result of the Atlantic salmon program. This question was intended to provide baseline data in the event of increased Atlantic salmon eco-tourism in the future. However, a surprising number of businesses (5) responded that business was increased as a result of the salmon program, with a total of 228 additional customers to their businesses.

Business type	Yes	Possibly	Don't know	No	No answer	Total
Artists, Craftspeople, and Graphic Designers		6	3	4		13
Bed and Breakfast	1	5		1		7
Business Management, Marketing, and Services		3	1	2	1	7
Agricultural Products and Farm Supplies		2		4		6
Restaurant and Specialty Foods	1	2	1			4
Animal Care, Veterinary, and Boarding Services		1		1		2
Antiques, Gift Shops, and Galleries		1		1		2
Environmental Services and Land Surveying		1	1			2
Grocery Markets and General Stores	1	1				2
Landscaping, Garden Supplies, and Tree Service				1		1
Recreation		1				1
	3 (6%)	23 (49%)	6 (13%)	14 (30%)	1 (2%)	47

Table 4. Whether respondents think the current salmon restoration program in the Westfield River basin could provide economic benefits to their business, by business type.

More than half (55%) of the business owners who responded to the survey think that the current salmon restoration program in the Westfield River basin would or could possibly provide economic benefits for their business. The most positive responses were from art businesses. An additional 30% replied “no,” it would not benefit their business, and 15% either responded that they did not know or did not answer the question (see Table 4, above).

	Yes	No	No answer
# Responses	10	35	2
% Total	21%	74%	5%

Table 5. Level of awareness of broodstock fishery in lakes and ponds in Massachusetts.

Only one fifth of all respondents (21%) were aware that people can currently fish for adult broodstock Atlantic salmon, a by-product of the restoration program, in lakes and ponds in Massachusetts (see Table 5, above). Forty percent of respondents think this current landlocked fishery could possibly provide benefits to their business (see Table 6, below).

Business type	Yes	Possibly	know	No	answer	Total
Artists, Craftspeople, and Graphic Designers		4	2	6	1	13
Bed and Breakfast	1	5		1		7
Business Management, Marketing, and Services		1	2	3	1	7
Agricultural Products and Farm Supplies		2		4		6
Restaurant and Specialty Foods		1	2	1		4
Animal Care, Veterinary, and Boarding Services				1	1	2
Antiques, Gift Shops, and Galleries		1	1			2
Environmental Services and Land Surveying			1		1	2
Grocery Markets and General Stores	1	1				2
Landscaping, Garden Supplies, and Tree Service	1					1
Recreation		1				1
	3 (6%)	16 (35%)	8 (17%)	16 (34%)	4 (9%)	47

Table 6. Whether respondents think that the current landlocked fishery in Mass. could provide economic benefits to their business, by type.

Willingness to Pay

To estimate an economic measure of support for the restoration program, this study uses contingent valuation methods to establish a willingness to pay for the resource. Contingent valuation methods are used to estimate the economic value and benefits of a non-use, non-market natural resource. These methods are often used for formal cost-benefit analyses, required for most public programs since the early 1980's.

The strength of contingent valuation methods is that they the use of the universal, persuasive language of money to express public interest and support for non-use environmental resources. However, this assessment does not account for the rich, deeply held values that people may have for the resource.

Respondents were asked the highest annual amount 1) their business and 2) they as citizens would be willing to pay to have the Atlantic salmon restoration program continue in the Westfield River basin. It was made clear that this information would be only used to measure the economic value of the program, that this was not a solicitation of funds.

The average annual amount businesses are willing to pay for Atlantic salmon restoration to continue in the Westfield River basin is \$18.94, inclusive of those not willing to pay. About half (47%) of all respondents expressed a willingness for their business to pay for Atlantic salmon restoration. Of those willing to pay, the average amount is \$40.45 per business (see Table 7).

Summary of Responses	Business	Citizen
# Willing to pay (# and % of respondents)	22 (47%)	24 (51%)
Of those willing to pay, avg. amount (\$)	\$40.45	\$28.33
Not willing to pay (# and % of respondents)	25 (53%)	23 (49%)
Of all respondents, avg. amount (\$)	\$18.94	\$14.47

Table 7. Willingness to pay for the current Atlantic salmon restoration program in the Westfield River Basin, by business and citizen.

The average annual amount private citizens are willing to pay for Atlantic salmon restoration to continue in the Westfield River basin is \$14.47, inclusive of those not willing to pay. About half (51%) of all respondents expressed a willingness to pay for salmon restoration as a private citizen. Of those willing to pay, the average amount is \$28.33 per respondent (Table 7).

Respondents were given a blank space to explain their willingness to pay as a business or as a citizen. **The primary reason for a willingness to pay is support for environmental causes, including Atlantic salmon restoration** (50% of those willing to pay). Half of these respondents specifically listed support for Atlantic salmon restoration as the reason they are willing to pay. Other reasons for a willingness to pay include: increased benefits to business, respondent is an angler, and guilt. Some reasons seemed to explain why respondents did not pay more. These responses include lack of financial resources and no direct benefits (see Table 8).

Reason for paying	Business	Citizen	Total
Supports environmental causes.	3	9	12
Specifically supports salmon restoration.	4	7	11
(No answer)	4	4	8
Will benefit business.	4	0	4
Angler.	2	2	4
Lack of financial resources.	2	1	3
No direct benefits.	2	0	2
Guilt.	1	1	2
	22	24	46

Table 8. Reasons for willingness to pay for Atlantic salmon restoration in the Westfield River basin (some responses imply that respondents may have paid more under other circumstances).

The top reason for not paying for both citizens and businesses is a lack of financial resources (31% of those who would not pay). Other reasons include no direct benefits to

business/citizen, not a salmon consumer (angler or eater), other interests, and a need for more information. Two respondents reported that they do not think the program will work, both adding that they were very interested in having salmon in the Westfield River (see Table 9, below).

Reason for not paying	Business	Citizen	Total
Lack of financial resources.	8	7	15
(No answer)	6	7	13
Not a salmon consumer (angler or eater).	3	4	7
No direct benefits.	5	1	6
Does not think program will work.	2	2	4
Other interests.	0	2	2
Need more info.	1	0	1
	25	23	48

Table 9. Reasons for not being willing to pay for Atlantic salmon restoration in the Westfield River basin.

The willingness of businesses to pay for Atlantic salmon restoration in the Westfield River drainage (\$14.47-\$18.94) is twice as high as the average New England citizen's willingness to pay (\$7.93). This range is similar to other species such as grizzly bear, bald eagles, wolves, sea otters, and big horn sheep (Brown, 1993). Willingness to pay for these species ranges from \$13.62 for sea otter to \$17.39 for wolf recovery in Yellowstone National Park. Willingness to pay for the striped shiner is significantly lower (\$5.55), and willingness to pay to assure the existence of spotted owl is much higher (\$49.72) (see Table 10).

Author (Year)	Species	Willingness to pay, \$/household/year
Boyle & Bishop (1978)	Striped shiner	\$5.55
Stevens, <i>et. al.</i> (1991)	Atlantic salmon restoration in New England	\$7.93
Hageman (1985)	Avoid reduction in sea otter population	\$13.62
King, <i>et. al.</i> (1986)	Survival of a local herd of big horn sheep	\$15.14
Brookshire, <i>et. al.</i> (1983)	Improvement of grizzly bear habitat	\$15.20
Stevens, <i>et. al.</i> (1991)	Bald eagle restoration in New England	\$15.81
Duffield (1992)	Wolf recovery in Yellowstone N.P.	\$17.39
Rubin, <i>et. al.</i> (1991)	Assure existence of spotted owl	\$49.72

Table 10. Summary of recent economic studies of non-use wildlife values (Brown, 1993).

Conclusion

This survey reflects a wealth of interest and support that business owners have for Atlantic salmon restoration in the Westfield River drainage. Harnessing support throughout the basin could result in direct, tangible benefits to Atlantic salmon restoration efforts, including: increased awareness and interest, volunteer assistance, collaborative marketing efforts, and financial and legislative support.

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Appendix A. Survey of the Economic Impacts of Migratory Fish Restoration on the Businesses in the Westfield River Basin.