

Division of Marketing  
Agricultural Development and Diversification (ADD) Program

1991 Grant Final Report

Grant Number 06004

**Grant Title**     Freshwater Salmon Culture Wisconsin (Phase 2)

**Amount Awarded**     \$13,500.00

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WISCONSIN DIVISION

FINAL REPORT AND EVALUATION -- FRESHWATER SALMON CULTURE IN WISCONSIN  
June 1992

This project has covered two years, from July of 1990 to June of 1992. The main objective has been the adaptation of salmon species, as highly marketable food fish, to Wisconsin aquacultural waters, in an effort to diversify agriculture in Wisconsin. Aquaculture as a whole represents an area of great diversification potential in Wisconsin, due to our abundant, cold, pollution-free waters, to American's growing appetites for fresh, low-fat, high-protein foods, and to consumers' concerns regarding pollution and wildlife issues.

The grow-out of four populations of fish -- Atlantic and Coho Salmon hatched in 1991 (Phase I), and Coho and Baltic Steelhead Salmon hatched in 1992 (Phase II) -- will continue to market size (3/4 lb.) and beyond, to fish-out and broodstock sizes, as proposed from the start of the project. Further attempts with new hatches are questionable, pending near-future performance and evaluations. Recapitulation and analysis of our efforts follows.

With regard to both price/availability and performance (growth and survival), our experience with the 1991 hatches was discouraging -- prices were high and growth slow. Subsequent inquiries have led to more domesticated and freshwater-adapted strains of Coho eggs -- notably, the DomSea strain developed in Washington State, which is the primary strain used in Baby Coho culture in Idaho and the Pacific Northwest. These were hatched in January of 1992 in Star Prairie, with vastly improved results, at a cost per egg one half of what was previously paid for the East Coast strain.

With Rainbow Trout, growth from hatch to market size requires 18 months (at 50 degrees F.); our hope was that salmon, whose culture and kinship are so close, would perform similarly. Sixteen months have now elapsed since our 1991 (Phase I) Coho hatch, and fifteen since our 1991 Atlantic hatch. In both cases, the salmon growth performance has lagged way behind that of Rainbows. Our largest Cohos average one fifth pound; Atlantics smaller yet at about one eighth. Smoltification, or tendency of salmon to migrate downstream to the ocean at about one year of age, causes temporary erratic behavior, inappetance and growth limitation; this was expected to cause salmon growth to fall behind, only to accelerate thereafter. The growth rate has increased, as have the fishes' appetites, three months past the smolt, but far too little, so far, to compensate for the slackened pace prior to the smolt.

Our Phase II (1992) hatches have so far outperformed the earlier efforts. This year's DomSea Cohos weigh in well over 100<sup>\*\*</sup> already -- a size not achieved by the 1991 hatch until mid-August. In fact, the DomSeas were better from the start -- eyed eggs were received almost hatching in early January and the hatch was complete within two weeks, while the previous batch required an additional month just to reach this stage. The Baltic Steelhead eggs received eyed at the same time have done well but not as well as the DomSea Cohos. Their hatch was not as complete (92% compared to the DomSea's 97%[!!]) and the larvae were not nearly as quick to take to starter feed. Since then, growth has been excellent for the top half of the crop, and fair to poor for the rest. This reluctance to feed and grow seems typical of both 1991 strains, also.

DomSea Cohos, so far, are the strain of choice amongst salmon at Star Prairie. Making such a determination was one major objective of the project, Phases I and II. The continued excellent performance of these fish will go a long way toward assuring our continued involvement in salmon culture beyond the project duration, and toward our encouraging other existing or prospective aquaculturists to attempt salmon culture.

Other objectives outlined in the original proposals included site improvement and salmon market studies. Site improvements have corrected problems of containment and erratic smolt behavior, bird predation, and increased flow and oxygen requirements (see previous progress reports). Market studies over the last two years have charted wild fluctuations in prices probably common among fledgling ventures such as aquaculture. The current line is the most unbelievable of all. Wholesale prices of fresh 8 ounce deboned baby Boho Salmon *exceeds* that of whole 8-10 *pound* fresh Atlantic Salmon by about half a dollar per pound. This value is also about 50% higher than the wholesale price for fresh 8 ounce deboned Rainbow Trout from Idaho. Baby Coho and Rainbow Trout prices have been quite stable over the years; the larger fresh Atlantics have become more and more available due to increased production (and massive large-scale grower bankruptcies), so prices have dropped. Baby Coho prices have actually increased somewhat due to decreased availability. Numerous Baby Coho growers in southern Idaho have apparently abandoned the species in favor of the easier, cheaper but more profitable Rainbows! Previous progress reports detail this transition also.

In light of these objectives, the project seems to have been a success -- all of the objectives have been attained. But, the single major objective, that of adapting pansize salmon culture to Wisconsin's aquacultural environs, has not been *as* successful. Based on last year's experience, neither Coho or Atlantic Salmon can be raised to market size in Wisconsin's spring-water facilities as profitably as Rainbow Trout can. This year's experience with the more domesticated, more freshwater adapted, DomSea Coho strain, may still prove otherwise. Such is my hope, but we'll still have to wait the approximate 18 month span from hatch to market size. That'll put us at mid-summer 1993 before a final evaluation is possible. Optimistically, the current hatch of DomSeas is beating up on the previous efforts. I'm encouraged by the Steelhead too, though I still don't know if these 'salmon', which share the genus and species of Rainbow Trout, can legally be sold as salmon or not!

Rainbow Trout culture is an established practice, and trout markets are similarly established in restaurant and grocery distribution networks. Value-added fish products (especially smoked fish) are also quite competitively available. Locally raised, quality-controlled trout products justifiably earn a market edge due to limited availability and superior quality. As the salmon market so vastly exceeds the trout market, so the locally-raised and value added salmon products market exceeds exponentially the huge, glutted salmon products market.

The culture of salmon in freshwater has been undertaken in the vast salmonid production areas such as Idaho and the Pacific Northwest. Locally raised, northern tier-produced fish, because of superior quality, extremely cold water, will maintain this edge in the marketplace if salmon can in fact be adapted to our waters. Millions of dollars per year are also spent annually on fertilized salmonid eggs. Prospects for development in the area of salmonid eggs in Wisconsin are possibly greater than in the area of high end food markets. Broodstock facilities require first and foremost conditions favoring fish health rather than growth. Colder water, while retarding growth, promotes fish health.

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Footnote: 11/11/92: DomSea Cohos continue to perform well, as well as Rainbow Trout; they have caught up to the previous year's Coho strain and passed the Atlantics!

STAR PRAIRIE TROUT FARM -- FRESHWATER SALMON CULTURE, PHASE II  
PROGRESS REPORT -- 6/10/92

FINAL REPORT -- PROJECT COMPLETION

With the advent of summer comes the official project completion, as the year is up. The actual raising of salmon in freshwater spring-ponds in Wisconsin continues, however, into a still uncertain future.

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Since the last progress report, grant related activities have included feeding young salmon, continued market pursuits, continued production of value-added salmonid products in our smokehouse, purchase and installation of hatchery aerators and demand feeders, and making innovations to the smokehouse facility (upgrading power service, larger grates, improved controls and heat elements). Accompanying invoice details related expenditures. All grant funds have been received with the exception of \$500 to be disbursed upon project completion.