Market Opportunities and Strategies for Oregon's Freshwater Aquaculture

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Prepared by
Dr. Ed Schmisseur, Agribusiness Management Consultant
321 NW 33rd Street
Corvallis, OR 97330
edschmisseur@comcast.net
541.753.1383

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Background: The Study and Its Focus

The Oregon Aquaculture Association, a non-profit corporation with a statewide membership of fish propagators, initiated this study to identify and assess market opportunities and strategies for Oregon's freshwater aquaculture producers. Other Oregon Aquaculture Association interests included evaluating legal and regulatory environments, disease inspection, and educational and technological support in Oregon compared to other contiguous states. This Oregon versus contiguous state comparison is addressed but limited solely to regulatory authority. Limited funds precluded comparing disease inspection and educational and technological support in Oregon and its surrounding states. A USDA Rural Business Enterprise Grant provided funding for the study with matching funds provided by the Oregon Aquaculture Association.

In this report, freshwater aquaculture market opportunities are identified and assessed. Then, market strategies that compliment those market opportunities are presented and discussed. Each of these strategies should further increase market demand for Oregon's freshwater aquaculture production. Finally, differences in regulatory authority of aquaculture in Oregon and its contiguous states are briefly presented and discussed.

Market Opportunities

Market opportunities for additional freshwater aquaculture production are identified in this section of the report. Some of these opportunities either have not been used by Oregon's freshwater aquaculture propagators or been limited in use. Like most opportunities, risk and returns must be carefully considered. In this study, no attempt was made to determine the profitability or risk associated with any of the market opportunities identified. Much more market information than is presented here needs to be acquired and detailed production cost information is required to provide useful risk and returns assessments. Finally, the sequence of presenting market opportunities has no intended significance.

Aquaria Fish

Ornamental or aquaria fish are in high demand and demand is growing. Koi, some goldfish, and rare tropical fish are a few of the most highly demanded aquaria species and they command high prices. Propagators seeking to enter this market should be aware that it could be a high-risk market because the market is difficult to enter, competition is intense, specialized fish brokers are embedded in the producer-to-retailer market chain, and growing some of the rare tropical fish requires special growing equipment with a high capital investment. Finally, nation-wide chains like Petco have recently entered the aquaria fish market and are increasing market share while driving down wholesale prices and driving out independently owned retailers.

The volume of aquaria fish sales is difficult to determine because of the structure of its market. Numerous, independently owned pet stores retail aquaria fish among a multitude of other pet related products and internet sales volume and value expected to be large, are unknown. A comparison of the 1998 and 2005 Census of Aquaculture does not suggest a significant expansion in aquaria fish production, yet it is believed to be occurring. Census data confirms that the number of producers has increased from 345 farms in the U.S. in 1998 to 358 farms in 2005. However, in this same period, sales declined from $69 million in 1998 to $51.3 million in 2005 (http://www.agcensus.usda.gov/Publications/2002/Aquaculture/index.asp). This decline in value of sales is probably due to fierce price competition from numerous worldwide sophisticated online aquaria fish retailers and the recent entry into the market of nation-wide chain pet stores.

In Oregon, the number of farms producing aquaria fish increased from two in 1998 to eight in 2005. This is an indication that the ornamental/aquaria industry

in Oregon is growing. In 2005, three of these eight farms produced goldfish and seven of the eight farms sold Koi (http://www.agcensus.usda.gov/Publications/2002/Aquaculture/aquacen2005_13.pdf.

Based on the expectation of a growing demand for aquaria fish, Oregon warm water fish propagators might consider some level of aquaria production to increase income. Risk exposure related to this venture should be reduced but not eliminated if growers could introduce aquaria fish as a poly-culture in their existing warm water production systems. This should lower production costs and make grower prices more competitive. Propagators also might choose to phase in expansion of aquaria fish production as new management experience is gained. Expanding too rapidly is the major cause of small business failure.

Wholesaling directly to local independently owned "pet store" retailers is suggested. This will eliminate broker costs but require contacting, product marketing, and providing special services with each retailer. Retailers located along the highly populated I-5 corridor and those closest to production facilities should be the first market contacts.

Aquaria Fish Food

A direct by-product of aquaria fish production is fish feed. Fish that do not meet standards of the ornamental retail market can become the feed for fish meeting market standards. Additional processing and packaging of fish feed, however, is required. Limited resources precluded identifying fish feed production amounts, processing and packaging requirements, and the profitability of this activity. Producers considering the production of aquaria fish should carefully evaluate the economics of fish feed production, processing, and packaging, as additional profits from aquaria fish production could be generated.

Garden Pond Fish

A large but unknown number of metropolitan, urban, and rural garden ponds exist in Oregon or for that matter most other states. The number of ponds and the average volume of water in these ponds increase annually. These trends will probably continue for many years. Many of these garden ponds are stocked with fish. Goldfish and Koi are currently popular stocked species. However, other species with vastly different attributes might be better stocking choices.

Oregon's freshwater aquaculture propagators have the opportunity to promote and market for garden pond stocking many of the species they routinely produce. Trout, bass, bluegill, catfish and possibly other species could thrive in a garden pond culture. As alternatives to Koi and goldfish, these species could be priced quite competitively, and marketed as being more hardy, natural, and "native". Entering this market, however, will be challenging. It will be difficult to identify possible market buyers and market demand will be difficult to determine. The garden pond market opportunity deserves further investigation.

Live Fish Markets

Oregon's only known live fish markets are in need of live fish. In initial discussions with fish market buyers, a live fish supplier is wanted. Both of these live fish markets are Asian groceries in the Portland metropolitan area. The live haul food fish market is relatively new in Oregon. In California, the market is more mature and sells about five million pounds annually (http://californiaaquacultureassociation.org).

The Uwajimaya grocery, located in Beaverton Oregon at 10500 SW Beaverton-Hillsdale Hwy (http://www.uwajimaya.com/upb/index.html) and headquartered in Seattle with sister groceries in Bellevue and Seattle Washington (http://www.uwajimaya.com/sea/index.html) is interested in purchasing trout, catfish, tilapia and striped bass for their live fish tanks. The Oregon store expects to initially market about 40 pounds of live fish per week. With multiple fish species, weekly sales could be even greater. In addition, with the extended presence of live fish, weekly sales should increase even more. Occasionally sales could grow to 80 pounds per week. Fish purchasing contracts for all of their stores are handled at Uwajimaya headquarters in Seattle, Washington. They can be contacted online (http://www.uwajimaya.com/hellp/contact.html). Marketing live fish to the Beaverton store presents Oregon aquaculture propagators an opportunity to market live fish and possibly fresh fish in all three of the Uwajimaya stores. Study funding limitations precluded assessing fish marketing opportunities in Seattle and Bellevue. Establishing a long-term marketing relationship with the Beaverton store and diligently servicing a live fish contract should create other fish marketing opportunities in the Beaverton store and possibly the two other stores as well.

Fubonn, (http://www.fubonn.com/supermarket.php) located in southeastern Portland, is seeking both catfish and tilapia for their live fish facilities. Initially about 300 pounds of live fish could be immediately handled. On

average around 40-50 pounds of live fish could be marketed weekly. Continued availability of live fish would eventually increase weekly live fish sales. A valid fish wholesaler's license and a sales agreement is all that is required to supply live fish to Fubonn. Providing live fish may also provide the opportunity to eventually market fresh fish to them as well. A history of price competitive live fish contracts and excellently executed service of these contracts could influence the store fish manager to try other fish products from the live fish vendor. Fubonn supermarket is located at 2850 SE 82nd Ave., Suite #1 Portland, OR 97266.

Risks associated with selling live fish to Uwajimaya and Fubonn are minimal. The market is in close proximity to several aquaculture propagators and the market is already established. Soon, someone will grab this opportunity and probably take advantage of collateral sales opportunities as well. Two important issues in contracting will be the wholesale price of live fish and contract length. Ideally, wholesale prices would cover total production costs of the fish plus a profit margin for the growers and the cost of servicing the contract (fish delivery costs and cost of providing other services) and a profit margin for servicing the contract. A minimum wholesale price would cover all the variable costs plus some of the fixed costs of growing the fish plus all the costs of servicing the contract. The initial contract should be a year in length. This length of time should provide enough experience and information to negotiate better contracts in the future.

Fresh Fish Markets

The fresh food fish market has a high payoff potential, but it also has a high capital investment for processing equipment. In addition, in the Pacific Northwest, salmon and other seafood have a relatively high and well-established market demand and shelf space assignment. Established competition and the predominance of large chain groceries relying on large volume wholesale fish brokers for product are another major barrier to market entry.

The easiest way to enter the fresh food fish market is through independent groceries and independent, specialty fish stores. These niche markets generally have more flexibility in making purchases. Independent and specialty fish markets, however, are relatively few in number. Uwajimaya and Fubbon are examples of independent stores and are an excellent source of market entry points. Often initial entry into these types of stores can be on a trial basis. This greatly reduces risk for both fish producer/processor and the retailer. And, market expansion can be slower paced which can lower everybody's risks.

Another entry approach to the fresh, food fish market is creating a product that has additional and preferred attributes such as organically produced, sustainable, and has food safety-quality assurance guarantees. Any one of these preferred and tangible attributes could increase demand and improve the ability of growers to capture market access, shelf space, and possibly, but not necessarily, command a higher retail price. More about acquiring these tangible attributes is presented in the next part of this report.

Funds for Stocking Public Waters with Private Hatchery Trout

Currently, Oregon has no special funding sources for stocking public waters with trout purchased from private hatcheries. Both California and Washington, however do. California uses some of its revenue from sports fishing licenses. Washington accepts corporate funding for trout stocking from private hatcheries. Neither of these funding approaches is particularly helpful for Oregon. Compared to California, Oregon has many fewer purchasers of sports fishing licenses. Furthermore, the number of Oregon licensed anglers continues in decline. Oregon had 100,000 fewer licensed anglers in 2007 than in 1987 (Corvallis Gazette-Times, March 30, 2008). Judgment about the success of corporate funding in Washington is unclear.

Instead, Oregon's Confederated Tribes might be a better potential source of funds for stocking Oregon's public waters with trout purchased from Oregon's private hatcheries. Tribes with well-established and developed destination casinos and those wanting to place their casinos off tribal lands should be quite interested in creating goodwill through this investment. Casino profits besides generating additional dollars that are reinvested in the tribal economy also generate dollars for tribal philanthropy. Some of this philanthropy could be used to fund long run, supplemental trout stocking in Oregon's public waters. Federally recognized tribes within Oregon include: Cow Creek Band of Umatilla Indians, Confederated Tribes of Grande Ronde, Confederated Tribes of Warm Springs, Confederated Tribes of Coos, Lower Umpqua, and Suislaw Indians, Confederated Tribes of Siletz, Klamath Tribe, Coquille Tribe, Confederated Tribes of Umatilla Indian Reservation, and Burns Paiute Tribe. These tribes are located throughout most of the state of Oregon. Several, but not all, of these tribes, have been very successful in developing and promoting destination casinos. The others have similar goals, if not active plans already underway.

Tribal funding of trout stocking from private hatcheries should produce much goodwill from this socially satisfying investment. This goodwill compared to their usual philanthropy should be dispersed to quite different segments of society.

Goodwill would be bestowed to the people who fish for the trout, local residents who live near these more productive fishing waters, fishing related businesses, and Oregonians everywhere who enjoy recreating on the waters of Oregon. Goodwill would be bestowed upon tribal members too. Funding trout stocking by purchasing trout from private hatcheries would help reconnect tribal members to their ancestral heritage--the land, its waters, and the fishery.

The approach to tribes to secure funds for supplemental trout stocking from private hatcheries should be carefully planned, well prepared, and well advised. Employing an advisor to assist in the development of the plan and proposal is highly recommended. The advisor should be an individual who is experienced with tribal affairs. Highly preferred experience would involve activity in tribal philanthropy. Limited funding precluded identifying individuals with this level of expertise. Tribes with the greatest need for creating goodwill or a broader focus of their philanthropy should be those first approached. In this study, no attempt was made to identify specific tribes meeting these criteria. However, the Confederated Tribes of Warm Springs might wish they could have funded supplemental trout stocking in Oregon's public waters gaining more support for relocating their casino.

Probably the best approach to secure funds for supplemental trout stocking is educating Tribal Councils or Boards of Directors about the local economic benefits generated by this type of philanthropy. They should be informed that generated economic benefits occur to a diversity of local people and local businesses. Even estimates of how much economic impact is generated can be calculated and provided. Then, tribes need to know how to use public relations people to make local people aware that economic benefits are occurring to them as a direct result of the tribe funding supplemental trout stocking for local public waters. Ultimately, the tribe has to decide to use philanthropy funds to supplemental trout stocking and diversify the goodwill created by their philanthropy.

Market Strategies

Market opportunities and market demand can often be stimulated by a variety of producer and retailer strategies. Advertising, convenient packaging, and providing nutritional information are some simple examples of strategies designed to stimulate market demand or create market entry opportunities. In this section of the report, strategies requiring effort by Oregon's freshwater aquaculture propagators are presented. Some of these strategies require others to cooperate and participate while some will have to be delayed until the time is right. All will require valuable time to execute.

Establish Approved Fish Species for Stocking

Oregon's freshwater aquaculture propagators should strongly encourage the Oregon Department of Fish and Wildlife to develop for identifiable geographical areas of the state approved fish species acceptable for stocking in Oregon's private ponds and public waters. This listing should be easily placed on the Department of Fish and Wildlife's website {("http://www.dfw.state.or.us/fish")}. Historical stocking data, if available, could be the initial basis for approved stocking species otherwise the latest stocking data would be sufficient to start a database and provide some stocking information. In the absence of any data, identification of approved species should be expedited.

Pond owners would find an approved fish species list valuable when selecting fish for stocking. Sport anglers might use this information to determine what parts of the state have been stocked. Stocking information about public waters might even increase the demand for sports fishing licenses because anglers have access to fish stocking information. Idaho Fish and Game provides this type of information on their website http://www.fishandgame.idaho.gov/fish/ponds. Oregon's freshwater aquaculture propagators also should know with certainty what fish species are recommended. This should reduce some of the turnaround delays associated with the approval of fish transportation permits. In addition, the Oregon Department of Fish and Wildlife should be able to save valuable staff time because fewer invalid transportation permits are submitted.

Recommendation: *Oregon's freshwater aquaculture propagators who market pond stocking species might choose to get pond owners involved in supporting them to require the Oregon Department of Fish and Wildlife to develop for identifiable geographical areas of the state approved fish species for pond stocking and should be listed on the department's website. This issue should be*

raised at a meeting of the Oregon Department of Fish and Wildlife's Private Hatchery Committee.

Provide Construction, Permitting, Screening, Stocking, and Management Practices for Ponds

Oregon's urban and rural landowners need ready access to information about pond construction, permitting, screening, stocking, best operating practices, what fish species are approved for stocking, and who has fish for stocking. Information like this should increase the demand for pond stock and it can be easily provided. Several options are available to publish this information. Each option has different advantages and disadvantages. Probably the best option would utilize the Oregon Aquaculture Association website (www.oregonaquaculture.org) for the dissemination of this information. In addition, it would be logical and a most helpful public educational service to have the Oregon Department of Fish and Wildlife's website providing a link to that information. Another option would place this information on the Oregon Department of Fish and Wildlife website, but that would need their approval, they would control the information presented, and listing who has fish for pond stocking might not be most timely or in the most preferred format. Another option would place this information on the Oregon State University Extension online uplinks. Its advantages and disadvantages are similar to those associated with placing information on the Oregon Department of Fish and Wildlife website.

Information about creating and maintaining ponds is readily available. The most recent information has been presented at Pond School 2007. Idaho's Department of Fish and Game website http://fishandgame.idaho.gov/fish.ponds/ provides pond management information specific to Idaho conditions and requirements. It can be used as a template for displaying information on the Oregon Aquaculture website.

Recommendation: *Develop pond construction, permitting, screening, and best management practices information on the Oregon Aquaculture Association website. Use the Idaho Department of Fish and Game website information on ponds as an example template. Work with the Oregon Department of Fish and Wildlife through their Private Hatchery committee to establish an on-line link to this information.*

Establish Commercial Production Conditions for Growing Exotic Species for Human Food Markets

Oregon's freshwater aquaculture propagators should encourage the Oregon Department of Fish and Wildlife to develop prudent transportation and production facilities requirements to produce exotic fish species used solely for fresh fish markets including markets in groceries, specialty fish retailers, and the restaurant and institutional trade. These production and transportation standards would ensure that Oregon's native fish population and their habitat would not be impacted by exotic species produced for the fresh fish food market. These standards would ensure that Oregon's freshwater aquaculture propagators had the opportunity to supply a variety of locally grown fish to meet food fish demands of Oregonians and others. In a world of increasing energy costs and dwindling supply from the ocean fishery, the demand for locally produced foods, including fresh fish from aquaculture producers will burgeon.

Recommendation: *Even though there are currently no known freshwater fish propagators in Oregon supplying the fresh fish market, Oregon's freshwater aquaculture propagators should request the Oregon Department of Fish and Wildlife to establish the production conditions under which exotic fish species could be commercially produced for the fresh fish market. This request would have more priority if Oregon's freshwater propagators would be supplying at least some fish to the fresh fish market.*

Publish Criteria for Evaluating Possible New Species for Release

The Oregon Department of Fish and Wildlife needs to publish or make known to the public existing criteria and procedures used to evaluate new species for possible propagation and release. This process could take several years to complete and require much effort. It will not be a high priority of Oregon's Department of Fish and Wildlife.

Idaho's Department of Fish and Game has adopted the American Fisheries (http://fishandgame.idaho.gov/cms/fish/programs/fish_plan.pdf) Society Seven Step Plan (http://fisheries.org/afs/publicpolicy_15a.html) when considering the possible release of new species. This plan might serve the Oregon public, its aquaculture industry, and the Oregon Department of Fish and Wildlife well into the future. The first step in the seven-step process seeks reasons or rationales for using an import. The second step involves a search, given the reasons or rationales, of possible contenders with a list prepared of those that appear most likely to succeed. It is in this step that both favorable and unfavorable aspect of

each potential species is noted. In the third step, a preliminary assessment goes beyond the area of rationale and considers impacts on target aquatic ecosystems, on game and food fishes or waterfowl, on aquatic plants, and on public health. Also, published information on the species is reviewed and the species is studied in preliminary fashion in its biotype. The fourth step involves publicity and review. The subject is entirely open and expert advice is sought. If the prospective import passes the first four steps, the fifth step, a research program is initiated by an appropriate agency or organization to test the import in confined waters such as experimental ponds, etc. In the sixth step, complete reports are circulated among interested scientists and presented for publication. The seventh step involves releases. When releases occur, they are monitored and the results are published or circulated.

Clearly established criteria and procedures for evaluating the introduction of new species for aquaculture production should make decisions by the Oregon Department of Fish and Wildlife more consistent, clearly founded on scientific knowledge, and decisions are creditable. It gives aquaculture propagators and other interests access to recommend new species. In addition, it guarantees them a systematic and fair assessment. Furthermore, the whole process becomes more transparent and that is better for everyone.

Recommendations: *This task needs to be started because of its long run impact on the Oregon aquaculture industry. However, it should not trump more immediate tasks that are much less controversial. Working with Oregon's Department of Fish and Wildlife on simpler tasks should buildup goodwill and create mutual trust that might be needed on this or other tasks.*

Acquire Preferred Attributes for Fresh Food Fish Production

In today's "new" marketplace, traditional values of price, taste, and freshness are now coupled with stewardship, community, health, honesty, integrity and authenticity (http://oregon.gov/oda/docs/pdf/070222_brd_min.pdf). According to Chuck Eggert, owner of Pacific Foods in Tualatin, a "national food company" producing 50% organic product, Pacific Foods customers also want food produced with integrity and traceability. And, even in fresh fish markets, consumers want and can be provided a product with recognizable attributes at competitive prices. Attributes alone, however, will not sell a product nor does it ensure a premium price, but attributes can help make the sale!

Several organizations provide services that certify preferred attributes are actually associated with production. They include Oregon Tilth Certified Organic

Program, Food Alliance Farm and Ranch Certification Program, and very soon the World Wildlife Fund. Each of these organizations has different approaches and produce different certified attributes. Oregon Tilth and Food Alliance are both Oregon based in Salem and Portland, respectively.

Although both Oregon Tilth and the World Wildlife Fund do not yet have a certification program for aquaculture, they are both included here because Oregon Tilth is interested in offering this certification and the World Wildlife approach is solely directed at aquaculture. Currently aquaculture is not under the scope of the National Organic Program; therefore, fish cannot be certified organic. The National Organic Standards Board, however, has proposed a rule that would allow organic aquaculture. There is no definitive timeline on when this rule will be adopted (communications with Tiffanie Huson Labbe, Oregon Tilth; Jan. 10, 2008).

Oregon Tilth Certified Organic Program: Oregon Tilth is a nonprofit research and education membership organization dedicated to biologically sound and socially equitable agriculture (www.tilth.org/index.html). It is primarily an organization of organic farmers, gardeners, and consumers. Oregon Tilth, among other things, provides organic certification services to organic growers, processors, and handlers internationally.

Oregon Tilth Certified Organic, OTCO, is an internationally recognized symbol of organic integrity. Organic certification ensures that the agreed upon conventions of organic agriculture systems are being practiced not only by growers, but also by all the people who handle and process organic food, feed, and fiber on its journey to the ultimate consumer. To accomplish this, Oregon Tilth provides a system that combines strict production standards, on-site inspections, and legally binding contracts to protect the producers and buyers of organic products.

Specifically, Oregon Tilth is a certification service for: Commercial producers of organic crops and livestock; Processors of organic foods, feed, and fiber; Handlers of organic products such as packers, brokers, distributors and wholesalers; Marketers of processed or co-packed organic products; and Restaurants and retailers specializing in organic fare. Also, Oregon Tilth offers Salmon Safe Certification to organic farmers that further protect water quality and biodiversity.

Information about Oregon Tilth's current certification program is available by simply downloading, free of charge, a certification package. Certification can be completed in 9-12 weeks. First year certification starts at $399 with recertification at $299. The annual certification fee is determined by gross sales. Oregon Tilth's address is: Oregon Tilth Inc., 470 Lancaster Drive NE, Salem OR 97301. Their telephone number is 503-378-0809 and email is organic@tilth.org

Food Alliance and Farm and Ranch Certification: Food Alliance is also a non-profit organization. It promotes sustainable agriculture by recognizing and rewarding farmers who produce food in environmentally friendly and socially responsible ways and by educating consumers and others in the food system about the benefits of sustainability (www.foodalliance.org). Food Alliance operates the most comprehensive third-party certification program in North America.

Their Farm and Ranch Certification Program distinguishes farmers and ranchers who: provide safe and fair working conditions; provide healthy and humane treatment of animals; raise animals without added hormones and antibiotics; raise crops without genetically modified organisms; reduce pesticide usage and toxicity; conserve soil and water resources; preserve and protect wildlife habitat; and commit to continuous improvement of these practices. In the certification process, farmers and ranchers must meet a set of fixed standards and a set of scored standards. Fixed standards that must be satisfied include: no use of genetically modified seed varieties or livestock breeds; no use of hormones or feed additives (nontherapeutic antibiotics) in livestock production; continued improvement of management and production practices; and no use of high toxicity pesticides on the prohibited pesticide list. Scored standards include whole farm and product specific standards. To become certified, applicants must score an average of three out of four points in each of the following areas: safe and fair working conditions; reducing pesticide usage; soil and water conservation; and wildlife habitat conservation.

Potential applicants can complete an online self-assessment to see if they qualify for Food Alliance certification. Applicants can download an application and get started. A $400 fee is payable at the time of application after which a single fee is paid annually based on gross sales of certified products. The Food Alliance address is: 1829 NE Alberta Street Suite 5, Portland OR 97211. Their telephone number is 503-493-1066 and email is info@foodalliance.org

World Wildlife Fund: Currently, the World Wildlife Fund is working with (www.worldwildlife.org/news/displayPR.cfm?prID=425) mollusk producers and buyers to discuss standards for the certification of mollusk aquaculture products that make up one-quarter of the world's aquaculture production. They are developing principles, criteria and then measurable and voluntary standards geared toward minimizing or eliminating the main environmental and social impacts caused by mollusk aquaculture. Once finalized, these standards will be given to a certification group to manage. One certification option includes an eco-labeled product sold in supermarkets and restaurants that gives buyers the ability to trace the origin of products, which will minimize concerns about food safety and hold producers responsible for their products. Producer participation could

yield preferential treatment from lenders, retailers, or chefs, and/or increased or differentiated market access and possibly premium prices.

The World Wildlife Fund also is initiating other promising dialogues. Dialogue groups are working to develop standards for salmon, shrimp, catfish, and tilapia (http://www.worldwildlifefund.org/cci/progress.cfm). And a new dialogue is about to be started with trout producers. Oregon aquaculture producers might occasionally monitor, if not fully participate in some of these important dialogues.

Recommendations: *Oregon aquaculture producers contemplating entering the fresh, food fish market should consider learning about the process of adding preferred attributes to fresh food fish products. Completing Food Alliance's self-assessment would provide them information about their certification standards and the attributes these standards produce. They should also occasionally monitor the certification activities of Oregon Tilth and the World Wildlife Fund. When organic aquaculture can be certified, interested aquaculture producers should inquire about the process with Oregon Tilth. As the World Wildlife Fund develops standards for species produced by Oregon aquaculture, especially trout, they also should be contacted.*

Evaluate a Food Safety/Quality Assurance Program for Fresh Food Fish Production

Consumers expect a clean and safe supply of food. Yet, each year in the United States contaminated food causes 75 million illnesses, 325,000 hospitalizations and 5,000 deaths (National Conference on Animal Production Food Safety, Saint Louis Mo., September 6, 2000). Food safety is the number one food priority.

But in food fish markets supplied by aquaculture, food safety appears to be of lower priority. For example, in May of this year, the US-Mississippi Agriculture and Commerce Commissioner pulled Chinese catfish from seven more grocery stores after samples tested positive for federally banned antibiotics (www.thefishsite.com/fishnews/4250/more_chinese_catfish_withdrawn). Now China's recent problems of food safety have spilled over to seafood contamination. Recently seafood samples have been found to contain concentrations of contaminants high enough to pose threats to human health (www.thefishsite.com/fishnews/4313/sweafood-from-china-may-pose-a-threat-to-human-health). More locally, it has been reported that Washington farmed fish have been fed diets with Melamine (www.thefishsite.com/fishnews/4253/contaminated_feed_tracked_to_six_state_ha

tcheries). This same chemical has been linked to a pet-food recall in the United States and the death of 16 cats and dogs. Food fish consumers note these and many other substantiated food safety failures and look for substitute food fish products without food safety issues.

Although food safety issues negatively impact the whole aquaculture production industry, they provide the Oregon freshwater aquaculture propagators an opportunity to create higher standards for food safety and, as a result, produce superior quality products for the market place. The opportunity and the challenge await all Oregon aquaculture producers, particularly those producing fresh market food fish.

Quality assurance programs have been developed by several national commodity organizations to make food safety the number one priority. They are market driven programs. Quality assurance requires that on-farm or individual producers address consumer needs and validate best management practices assuring food safety, animal welfare, and environmental quality. Production efforts must be practical and both economic and science based. And, most importantly, they must produce a measurable difference to the final user of the product.

A major part of a quality assurance program addresses feed ingredients. The United States broiler grow-out industry identifies specifications about microbiological quality of feed ingredients. They continually sample these ingredients to ensure they meet specifications and they test and sample ingredients for pesticides and other chemical residues. In addition, they have testing programs for finished feed pharmaceuticals, residues, and chemicals. Preslaughter chemical residue testing and monitoring is another element in the grow-out industry quality assurance program. They check drug withdrawal procedures, proper feed, and water withdrawal prior to the birds being delivered to the plant to help minimize fecal contamination when the birds are processed.

The American Veal Association also has a quality assurance program. Veal is a very specialized market-- primarily the white tablecloth restaurant industry. The program has two levels. Level 1 requires producers to maintain adequate records and a valid veterinary client patient relationship. It also requires producers to put in place a proper use of animal health care products plan, best management practices, and reviews facilities and management practices. Level 2 certifications require a farm plan assessment test that is completed with their veterinary. The veterinary client patient relationship is verified in writing and producers attend a veterinary question answer seminar that walks the producer through animal health care product use issues, residue issues, and best management practices. A third level is now being contemplated, which will target people who advising veal producers.

The National Pork Producers Council introduced pork quality assurance as a food safety program in 1989 (http://www.nppc.org/news/AnimalWellBeingWritten05-04-07.htm). The program gives producers information they need to provide the packer with the safest, highest quality product available. Initially producers contact pork quality assurance verifiers who go through the program with producers. In these discussions, expert advice about drugs and animal health product use is communicated. Also, production practices are discussed. Many of the practices deal with food safety and volatile residue avoidance and others help keep pigs healthy and productive. Afterwards, both the producer and verifier sign an enrollment card and send it to the National Pork Producers Council.

Recommendation: *Although food safety/quality assurance programs are most always developed by national industry organizations, a smaller group could mobilize and begin the development of a quality assurance program that meets consumer needs. As a producer, it is the best form of insurance you can have against food-caused illness. Numerous agriculture industries have such programs centering on best management practices and use of veterinarians to help producers through health care product use and residue issues. These agriculture industries welcome inquiries about their quality assurance program. They include the National Pork Producers Council, the American Veal Association, the Pacific Egg and Poultry Association, and many others not listed here (http://www.nppc.org/index.php), (http://www.americanveal.com/html/vqap.html), (http://www.pacificegg.org/ceqap.html).*

Explore Product Branding

Branding systems have many diverse goals but the same expectations that consumption of the branded products will significantly increase. Branding is simply a multi-commodity generic marketing campaign revolving around the development of a brand that depicts exceptional quality and encourages increased consumer purchases. Brands create a point of differentiation for retailers and consumers during the competitive period when purchase decisions are made. California has a branding program called "Buy California". New Seasons Markets (groceries) has the "Home Grown Program" that uses a special store logo making locally grown products easily identifiable and marketed. Oregon's program is called "Brand Oregon". Among other things, "Brand Oregon" adds premium value to Oregon agriculture products by marketing them under the brand label (http://www.oregon.gov/BRANDOREGON/BO0407.pdf).

Branding systems are for products that go "head-to-head" in competition with close substitutes in the market place. Branding can add value to the product, but the product must have consumer benefits that are worth the purchase price. More information about "Brand Oregon" is available from the Oregon Economic and Community Development Department (http://www.brandoregon.com) at 775 Summer St NE, Suite 200 Salem, OR 97301-1280 or online brand.oregon@state.or.us, or by telephone at 503- 986-0050.

Recommendation: *Oregon aquaculture propagators considering marketing fresh food fish should explore the possibility of using the "Brand Oregon" program. Using New Seasons Markets or possibly Whole Grain Foods local or "home grown" label might prove easier and be just as affective.*

Consider Using the Services of the Agriculture Development and Marketing Division of the Oregon Department of Agriculture

From its earliest beginning, the Agriculture Development and Marketing Division of the Oregon Department of Agriculture have been involved in local economic development. In this arena, it has helped Oregon farmers, ranchers, and fishermen develop new crops, products, and markets (http://www.oregon.gov/oda/admd/mktg_local.shtml). The division is experienced in direct farm marketing, vertical integration development, and promotional work at both the wholesale and retail levels for fresh and processed products. In a purely development role, they provide information and assistance on agriculture development issues that cross agency or multiple policy areas. Their services and activities include: Small business market development workshops for entrepreneurs developing new value added products; Development of local networks of producers to achieve greater market presence or to overcome production or distribution challenges; Local Oregon product showcases and promotional events; Community food system programs bringing local producers together with local retailers and restaurants; and Farm direct nutritional programs for farmer's market and farm stands.

Besides the core program concerned with local development, the Agriculture Development and Marketing Division is experienced in regional and national market development. Their experience and contacts provide them product introduction and market access for small to medium size companies wanting to place their products into both regional and national distribution. And, they have international market capabilities. They can open and develop export markets for Oregon producers through trade missions trade shows, technical seminars, and trade servicing. They are recognized experts in Pacific Rim markets.

Recommendation: *Oregon freshwater aquaculture propagators should contact the Department of Agriculture to gain a good understanding of the programmatic function of its Agriculture Development and Marketing Division. This educational task could be initiated by simply inviting representatives of the division to talk about functions and activities of the Agriculture Development and Marketing Division. Other informational needs could be addressed in additional meetings. These meetings should give aquaculture propagators an understanding of market issues, market tools, and promotions. A few of the aquaculture propagators, might wish to learn about the Division's international market capabilities. Other propagators might wish to attend a small business market development workshop hosted by the Agriculture Development and Marketing Division. . The Agricultural Development and Marketing Division can be contacted at 1207 NW Naito Parkway, Suite 104 Portland, OR 97209-2832 or email them at agmarket@oda.state.or.usor telephone them at 503-872-6601.*

Structure and Use the Private Hatchery Committee to Address and Resolve Issues Arising Between the Oregon Aquaculture Association and the Oregon Department of Fish and Wildlife

It appears that the Oregon Department of Fish and Wildlife's Private Hatchery Committee is the designated arena where issues between the Oregon Aquaculture Association, representing the Oregon aquaculture industry, and the Oregon Department of Fish and Wildlife are raised, discussed, and resolved. This action is commended. But, there remain concerns.

First, issues should be those brought forth from both the Oregon Aquaculture Association and the Oregon Department of Fish and Wildlife. From the Oregon Aquaculture Association perspective, they should be the industry's highest priority, not necessarily every issue of every freshwater propagator. If the latter is allowed to happen, the process is overwhelmed, important but difficult issues are often not addressed, and time is lost. To avoid wasting precious time of the Private Hatchery Committee, the Oregon Aquaculture Association needs to do its homework before each Private Hatchery Committee meeting. That is, they need to develop a very, very short list of their highest priority issues and then at the Private Hatchery Committee meeting address them.

A second concern is that a protocol or procedure for reaching resolution is not apparent. If a protocol has not been developed, one should be developed. The protocol should provide timelines for action. The protocol should provide accountability: who does what and when. The protocol should accommodate

planned and regularly scheduled progress reporting, feedback, and discussion sessions and a deadline for the resolution of each issue addressed.

Recommendations: *With approval from the current membership of the Private Hatchery Committee, they should confirm that the Private Hatchery Committee is the place to communicate, discuss, and resolve issues arising between the Oregon Aquaculture Association, representing the Oregon aquaculture industry, and the Oregon Department of Fish and Wildlife. Issues introduced for resolution should be those representing the industry's highest priority. If a protocol or procedure for reaching resolution of an issue has not been developed, one needs to be developed. A good protocol provides timelines for action and resolution, accountability, and progress reporting, feedback sessions, and brief discussions.*

Seek Additional Support

Now that the Oregon Aquaculture Association has experienced its first marketing study, they are experienced and credentialed to secure funds for other studies. A subgroup of propagators could seek funding for a market opportunity they wish to evaluate. Funding will, no doubt, require a money match. The funding contact for this study was Jeff Deiss USDA Rural Development, Oregon State Office, 1201 NE Lloyd Blvd. Ste. 801, Portland, OR 97232-1274. Contact him to find other funding sources and the probability of obtaining other grants.

Regulatory Authority Comparisons

In this final section, aquaculture's regulatory authority in Oregon and its contiguous states are highlighted. Important similarities and differences are noted and the impact on aquaculture is briefly addressed.

The primary authority of aquaculture production in Oregon, California, and Washington are the respective state's department of fish and wildlife or fish and game. Although their goal driven purpose is often worded a little differently, their primary mission is the preservation and protection of native wildlife and fish species for their citizenry's continued perpetual use. Not too surprising then, these honorable missions often place aquaculture production in competition with native species. Thus, aquaculture producers are often found working in a few confined niche market areas of a very, very large, promising, and diverse aquaculture industry. Aquaculture's secondary status often brings forth from these state agencies a secondary level of service to aquaculture propagators. This type of segregated services probably is not even recognized by these state agencies. The impact on the aquaculture industry of these types of mind-sets is difficult to quantify. Limited observation, suggests it probably reduces aquaculture's production efficiency and profits, and adds to the industries cost of production.

Although California's Department of Fish and Game governs aquaculture, it appears they treat the industry much more favorably than the industry is treated in Oregon and Washington. They are an exception. Several reasons for this more favored status might be the long history of the California aquaculture industry; the magnitude of aquaculture's economic contribution to the California economy, and/or the California Department of Fish and Game has an aquaculture coordinator who effectively represents the interests of the California aquaculture industry (Aquaculture in Inland Waters of California, Inland Fisheries-Informational Leaflet No. 35, prepared by Fisheries Program Branch Staff, July 2000, Updated September 2007) or online at (http://www.dfg.ca.gov/fish/administration/permits/aquaculture/index.asp). In fact, the industries long history and economic importance to the state probably helped to create the aquaculture coordinator position. Prescribed duties of the aquaculture coordinator suggests that California's aquaculture industry needed more influence in the California Department of Fish and Game decision making process. These duties included: Promote understanding of aquaculture among public agencies and the general public; Propose methods of reducing the negative impact of public regulation at all levels of government on the aquaculture industry; Provide information on all aspects of regulatory compliance to the various sectors of the aquaculture industry and; Provide such advice to aquaculture producers on project siting and facilities design that may be needed to comply with regulatory requirements. Besides an aquaculture coordinator,

California's Department of Fish and Game also utilizes an Aquaculture Industry Advisory Committee and an Aquaculture Development Committee to advise the California Department of Fish and Game director. Specifically, these committees are advisory to the director on all matters pertaining to aquaculture. Among other things, they assist the director in developing and implementing a state aquaculture plan and identifying other opportunities for industrial development.

California's aquaculture industry, no doubt, has benefited from having an aquaculture coordinator and aquaculture industry advisory committees in the California Department of Fish and Game. The California aquaculture industry continues to grow and the California Department of Fish and Game continues its primary mission to preserve and protect native fish species. The California experience has shown that aquaculture activities can flourish under traditional departments of fish and game authority. However, aquaculture interests must be heard and permitted to influence the department's decision-making process.

In Idaho, the primary authority of aquaculture production is the Idaho Department of Agriculture. This state agency recognizes Idaho's economic well-being is tied to the health of its farming (including aquaculture) and ranching. As such, they are a self-proclaimed pro-active resource to quickly adapt to new challenges and opportunities facing Idaho's agriculture industry and they support the growth and sustainability of their industry. (http://www.idahoag.us/categories/AboutISDA/Documents/strategic_plan/ISDA_strategic_plan2007.pdf).

Specifically anyone obtaining, possessing, preserving, or propagating fish in Idaho is required to have a commercial fish-rearing license from the Idaho Department of Agriculture (http://www3.state.id.us/cgi-bin/newidst?sctid=220460002.K). The Idaho Department of Agriculture requires that: Any commercial facilities not be constructed in or across any natural streambed, lake, or other watercourse containing wild fish; All water inlets are screened according to Idaho Department of Fish and Game codes; Effluent control facilities have been approved by the legally designated state and federal agencies; and A receipt shall be issued to each purchaser identifying the hatchery source and specifying the numbers and species of fish and the date of sale for all sales from fish ponds for a fee and for the sale of live fish for stocking destined for release as wild fish in private or public waters. Furthermore, the Idaho Department of Agriculture may inspect licensed commercial facilities, develop standards for marketing, and use representatives from commercial fisheries and the aquaculture industry for advice.

If facilities release fish into the waters of Idaho, including private ponds, they are regulated by the Idaho Department of Fish and Game. This state agency

has a mission very similar to like departments in Oregon, Washington, and California (www.fishandgame.idaho.gov/fish/ponds/ponds.cfm).

Idaho's regulation structure involving Idaho's Department of Agriculture and Department of Fish and Game with input from Idaho's commercial fishery and aquaculture industry provides Idaho's aquaculture industry with both a pro-active and a traditional regulatory resource. This structure could produce results similar to those produced by California's regulatory authority.

Conclusion

This evaluation is the result of a 9 month analysis of "Market Opportunities and Strategies for Oregon's Freshwater Aquaculture" funded by USDA Rural Business Enterprise Grant with matching funds provided by members of Oregon Aquaculture Association.

A significant element for the author was learning about members of Oregon Aquaculture Association, their independent goals and the goals of the organization. Additionally, considerable time was invested to understand the regulatory opportunity and challenges faces by those pursuing aquaculture in Oregon.

The analysis includes an overall review of the importance of aquaculture in terms of food and recreation within Oregon and elsewhere. The analysis also focuses on factors needed to implement success, including proactive involvement of agencies, producers and consumers.

Several recommendations are developed for consideration by members of Oregon Aquaculture Association. The next goal for the organization is to analyze this information, prioritize issues to be addressed and focus on those to achieve in the coming months.

For further information about this study and implementation, contact: Oregon Aquaculture Association, 408 N. Third Street, Stayton, OR, 97383. Further information is available at www.oregonaquaculture.org

Dr. Ed Schmisseur

Agribusiness Management Consultant
edschmisseur@comcast.net
321 NW 33rd St. Corvallis, OR 97330
541-753-1383

Emeritus Faculty Agricultural and Resource Economics
Oregon State University

Education

Ph. D. Agricultural Economics Purdue 1973
M.S. Dairy Management Purdue 1966
B.S. Dairy Science University of Illinois 1964

Consulting Projects

Evaluated market opportunities and strategies for Oregon's freshwater aquaculture. Oregon Aquaculture Association, Stayton, OR. 2007

Evaluated market share of fresh and frozen fryers in Western Oregon for Foster Farms Inc. Los Angeles, CA. 1999

Evaluated the economics of producing fuel grade alcohol from farm-produced grains, residues and specialty crops for Ethanol International Inc., Denver, CO. 1978-1979

Research Experiences

Developed management programs for dairy farmers and poultry layer managers. 1988-2000

Provided individualized expansion/reorganization strategies and advice to Tillamook dairy farmers adjusting to both increased milk processing capacity and changes in traditional farming systems. 1989-1991

Analyzed conflicts and complaints of commercial farm and forest operators attributed to residential uses and determined the economic impact on these operators. 1990

Evaluated the economic importance of Oregon's Race Horse Industry. 1986

Analyzed Eastern Oregon's livestock dependence on private and public forage resources. 1980-1984

Evaluated uses for waste thermal energy at the Celilo HVDC Converter Station. 1979

Projected the energy and water consumption of Pacific Northwest irrigation systems. 1977

Dr. Ed Schmisseur, Vitae, continued

Evaluated uses of geothermal fluids in the Klamath Basin. 1977
Developed and presented training materials on administrative techniques, management principles, and analytical procedures to aid or improve the operations, planning, and investment made by Oregon's smaller ports. 1977
Developed and presented the first management workshops exclusively designed for small farm operators in Central Oregon. 1977-1978
Developed market outlook and analyzed the economics of management options of Oregon cattlemen 1976-1979
Estimated the economic impact of U.S. Amy Corp. Engineers public investments on the Oregon Coast. 1975
Conducted an economic analysis and survey of the Oregon Coastal Area. 1974
Estimated water use and economic impacts on Oregon irrigators of alternative water pricing policies. 1974
Evaluated economic utilization of warm water discharge from power generating stations in Oregon. 1973
Evaluated risk and uncertainty associated with Jordan's wheat farmers adopting U.S. wheat varieties and production technologies. 1973

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Clear Creek Rainbow Ranch, Oregon City, OR
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