Fishing + Aquaculture = Sustainable Seafood Production

Speaking Notes

For

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CHECK AGAINST DELIVERY

Good morning everyone.

I would like to thank Randy Fisher and the organizers of this conference for inviting me to speak to you today. I think this is a great initiative and I look forward to hearing the other presenters and participating in the discussions.

My presentation today is entitled "**Fishing + Aquaculture = Sustainable Seafood Production**". I chose this theme after looking at the proposed agenda and seeing that it was a good opportunity to talk about what we have in common rather than what may divide us. I will welcome your questions and comments afterwards.

I would like to begin with a quote:

"Aquaculture, not the Internet, represents the most promising investment opportunity of the 21st Century"

This statement was made by Peter Drucker, the 94-year-old management expert, economist and Nobel Laureate.

"It's going to be fish farming," he said, because on the oceans "we are still hunters and gatherers." Expanding on this opinion, Drucker said that 20 years ago all salmon and shrimp consumed was wild; today 60 percent of each is farmed, and progress is being made with other species. He went on to say: "One reason: The oceans are over-fished and yield steadily decreasing returns. Another one: The tremendous population growth in two-thirds of the world – not peaking for another 25 years – requires a very substantial expansion of protein supply, and expansion of terrestrial domesticated animals is becoming increasing expensive and, above all, increasingly detrimental to the environment."

The development of aquaculture is a rational response to the increasing demand for protein in the world. Capture fisheries have peaked and no new growth is expected to come from this sector. Consequently, the supply has to come from somewhere else, and that somewhere is aquaculture – the farming of aquatic organisms including fish, mollusks, crustaceans and aquatic plants.

In fact, aquaculture is the fastest growing food production sector in the world, averaging a compounded rate of 9.2 % per year since 1970 (FAO, 2002). The reason is quite simple - supply and demand.

Aquaculture has become a new source of supply for fish and seafood because it can supply large volumes of fresh, high quality products on a consistent basis throughout the year. Fish and seafood buyers and consumers have become accustomed to the presence of farmed seafood in the marketplace, even if they are not aware that it is coming from aquaculture. Over the last 10-20 years, wholesale and retail preferences have shifted from wild caught to farm-raised fish and seafood. Prices for these farmed products have become stable and affordable to a large segment of the population. And this trend will continue well into the foreseeable future. Why? Because the human population is still growing and demand for fish and seafood is still growing.

Fishing alone cannot fill the demand and aquaculture alone cannot fill the demand. But fishing and aquaculture combined may be able to meet the challenge. And together they may become a more sustainable way to produce fish and seafood well into the future.

One of the top priorities that I set when I was appointed Commissioner back in 1999 was to work towards a closer collaboration between the commercial fishing sector and the aquaculture sector. Unfortunately, during my time as Commissioner I have witnessed a growing divide between these two groups rather than a coming together. Personally, I find this very unfortunate because I see more reasons for developing closer cooperation rather than the polarization that has taken place.

I would like to read to you this statement from a recent publication by the US Department of Commerce:

"The two industries which produce domestic seafood – harvesting and farming – are currently polarized. However, this lack of cooperation between producers is a national impediment to the growth of the national seafood industry. It negatively impacts their separate industries and fuels the vacuum on the domestic market, opening it wider to foreign imports." This is from – *The rationale for a new initiative in marine aquaculture*, Sept 2002. US Department of Commerce, NOAA, NMFS.

So we have to ask ourselves: What has brought us to this point in time, where fishing and aquaculture are facing each other as opposing sides in the same purpose – to provide fish and seafood protein to feed people around the world and especially in North America?

I can easily imagine why a fisherman might feel threatened by a new industry forcing prices down, taking up space in traditional territories and possibly having an impact on wild stocks. If I was a traditional fisherman, I would probably have some deep concerns about aquaculture too. If you've been through years of problems with your own industry, experiencing job losses and economic challenges, the last thing you want is what appears to be more competition. But the real question is: Why in North America cannot the two sectors sit down together to see if they can put aside their differences and divergent views temporarily and address their mutual concerns and needs. It has been done in other countries; it should be feasible in Canada and the United States.

What do these groups have in common? To me it is clear – they serve the same customer, a very demanding consumer of fish and seafood. The coming of age of aquaculture offers a perfect opportunity for the two groups to develop a common strategy to reap all the benefits of a growing demand for fish protein.

While I foresee much competition between the two sectors for market share, and the development of niche markets for their specific products, farmed versus wild, I can also envision a lot of cooperation on marketing, processing infrastructures, technology and research, live holding of fish for live markets, quality improvements, and probably the most important ones: food safety and traceability. In many cases, what is good for one is good for the other. The answer is to cooperate to find solutions, to save money, to sell more products and to increase the market for fish and seafood.

The struggle should not be between aquaculturists and fishermen, the real challenge for the combined sectors should be to increase the overall North American consumption of fish over poultry, beef or pork. All experts agree that there is a lot of room in North America to increase the consumption of fish per capita. So instead of arguing about which is the best product between farmed and wild fish for consumers, the two sectors should just admit that safety and quality can be delivered equally by both sectors and that fulfilling the needs of different clientele is just a question of marketing.

In others words, the two sectors should admit that there is a different customer for each product – farmed versus wild fish – in North America. The real challenge for aquaculturists and fishermen is to collaborate to establish standards of quality and safety (including traceability) and to develop generic marketing strategies, promotional material and branding that will increase the public confidence in fish and its overall consumption. Fighting for the market share of the other group is a very expensive waste of energy, especially if there is ample room for both products. Farmed fish and wild fish are not like poultry versus beef. For the consumer or buyer, it is the same fish product. It simply presents different marketing opportunities.

Another reason for the divide between aquaculturists and fishermen has been the alleged impacts of aquaculture on the environment and wild stocks. This argument has been amply utilized by well known environmental groups to foster opposition between the two sectors. The reality is that both sectors have their environmental challenges but both sectors have significantly improved their environmental performance during recent years, thanks to all of our critics.

A little over two weeks ago, during Aquaculture Canada 2003 in Victoria, I said that aquaculture, as practiced in Canada, is environmentally sustainable. Many environmental groups would challenge this statement, especially here on the West Coast. However, as a biologist with a good portion of my career devoted to environmental protection and wild salmon conservation, I am very comfortable saying it.

Don't get me wrong. I am not saying that aquaculture in general or salmon farming in particular produce no impacts on the environment. They obviously do. Every human industrial activity does, including the traditional capture fishery. But to assess the environmental sustainability of aquaculture requires that its environmental impacts be viewed in a more global context.

The argument is quite simple, but it is worthwhile to state it again bluntly. It is what Peter Drucker was getting to in his opinion on the opportunity of aquaculture. For the same reason that hunting deer and moose, and gathering wild fruits and berries to feed North Americans would not be environmentally sustainable, and would destroy these wild resources, it is clear that supplying the growing fish and seafood demand by wild harvest is not a viable, long-term environmentally sustainable scenario. On land, the solution has been modern agriculture. And although all types of agriculture, whether extensive, organic or other, require that forests be cut down and existing plant and animal life be removed, no one is suggesting that agriculture be abandoned and that we return to scouring the forests and grasslands for our food.
So, why not aquaculture? Why not accept aquaculture as a good thing and a way to go for our long-term supply of fish and seafood? Because all the evidence demonstrates that it is exactly that.

Overall, aquaculture has little impact on the environment. In fact, the relative area under aquaculture in Canada is miniscule. In 2002, it totaled 30,971 hectares, equivalent to an area 17.6 km long by 17.6 km wide or roughly the size of the core area of almost any one of Canada's provincial capital cities. In this very small area, the aquaculture industry produced approximately 24 percent of the value of all Canadian fish landings. To do a fair assessment of the environmental impacts produced by aquaculture on this tiny portion of our aquatic ecosystem, one has to compare these impacts to the ones produced by our Canadian strategy to produce the other 75% of the fish landing value: commercial fisheries. As we have seen in the literature over the last 10 years, commercial fisheries impacts are serious, complex and occurring far and wide along all our coasts.

Again, don't get me wrong. I am not saying that we should shut down all fisheries in favour of producing fish only through aquaculture. In North America, we have a luxury that many others don't; we still have plentiful ocean resources and many environmentally sustainable fisheries. These should continue to be carefully protected, managed and utilized as they have in the past, and continue making an invaluable contribution to the economic activity and social fabric of our coastal communities.

What I am saying is that, despite the criticism of well known environmental groups that aquaculture poses significant environmental problems, aquaculture is still very much an environmentally sustainable activity by which we can produce fish for future generations.

Again, instead of disagreeing and debating, both sectors should collaborate to ensure that we accept only aquaculture and fishing practices that are environmentally safe and that will ensure long-term sustainable production of fish in North America. It is in the best interests of both sectors to protect our environment, which is essential for ensuring that we keep our cost of production low and competitive compared to the rest of the world.

Although there may seem to be many reasons for opposition between the aquaculture and fisheries sectors, it is my view that there are many more reasons for cooperation and collaboration. Another example is the sharing of objectives and technologies. In fact, we have done so for a long time, and we currently share many more objectives and technologies than one would think at first glance.

I would like to remind you of the fisheries origin of modern aquaculture. It began with the salmon and trout enhancement activities in North America and Europe during the late 19th century and continuing throughout the 20th century to the present. These enhancement efforts are a response to declining catches of salmon and trout in our rivers and oceans.

What has become known as the beginning of modern salmon farming began in the 1960s when two Norwegians, the Vik brothers, attempted to growout some Atlantic salmon in pens constructed of wooden walkways on floats from which fishing nets were suspended. Something that you may not be aware of is that the Vik brothers were fishermen. Atlantic salmon stocks had declined in Norway as a result of hydroelectric developments on many of its rivers. The Vik brothers experimented with salmon farming because they saw it as a way to deal with the

situation and they persisted where others had failed. They succeeded because they believed that salmon farming could be made to work.

At about the same time in Scotland, the multinational food and detergent company, Unilever, was also experimenting with salmon farming but for a different reason. The western coastline of Scotland was an economic disaster area and Unilever's chairman, a keen sport fisherman who had a house near Loch Ailort, on the west coast, felt that salmon farming could bring prosperity to the area. Since he was the boss, he made it happen. The result was Marine Harvest, the biggest fish farming company in the world.

If we look at these two examples of the early days of salmon farming, what we see are attempts to solve the two major challenges facing coastal communities – fish stock declines and the resulting economic downturns. The same challenges facing many of our fishing communities today.

Now the shared objectives and technologies. The first example I would like to talk about is the practice of cod growout in Newfoundland. As you may know, the northern cod moratorium announced in 1992 by the Canadian Government caused 30,000 people to lose their jobs, the single-largest mass layoff in Canadian history. In the aftermath of this tragedy, cod fishermen began to seriously consider cod growout as a means to continue making a living in the fishery.

The concept is simple; small cod captured in cod traps in the spring are placed in pens and fed over the summer months and harvested in the fall when yields and market prices are traditionally higher. By this practice it is possible to grow a 1 kg fish to 2 kg in about 60 days, and as you know, the price received for a large fish is better than for a small one.

Beginning in 1997 with eight growers, 42,388 kg, round weight was harvested in the fall. By 1999, seven growers were able to harvest 108,266 kg. In 2000, 38 sites were licensed for cod growout of which 18 sites stocked 140 MT. In 2001 there were 41 licensed sites, 16 of which stocked 195 MT while in 2002, of the 48 licensed sites, 14 of them stocked 186 MT.

Government-funded technical support was provided to the fishermen through workshops on cod trap fishing and cod growout. Live fish harvesting, handling and transport techniques were demonstrated during a series of technology and information transfer sessions, providing fishers with the knowledge and practical know-how to culture wild cod. A limited amount of basic and essential equipment was provided to facilitate startup pilot operations and these enterprises are now in a position to undertake commercial small-scale cod farms using wild stock.

The second example is a practice developed by the scallop fishermen in the Gulf of St. Lawrence, on Iles-de-la-Madeleine. Initiated in 1991, a research programme called REPERE was undertaken to develop a method of enhancing natural populations of sea scallop which had been greatly reduced by overfishing.

Sea bed seeding was chosen as the best approach to achieve this goal. Early efforts centered on producing a supply of juveniles and developing intermediate culture methods. The Scallop Fishermen's Association, supported by government financing, initiated a commercial seeding project in which two thousand collectors were set out in open waters suitable for spat settlement.

The collectors produced a catch of 1.5 million spat. Intermediate culture in pearl nets in a lagoon, between July and October was observed to enhance growth quite noticeably. In the fall of 1993, 30,000 young scallops were seeded on a natural bed closed to fishing. Ten thousand collectors were set out in the fall of 1993. In November 1994, 1.5 million scallops were seeded on a sea bed closed to the fishery. Scallops from the 1994 seeding reach market size (90 mm) by 1997.

Since then, many millions of scallop juveniles have been seeded every year on the fishing grounds around les Iles-de-la-Madeleine. And the first major commercial harvests of seeded scallops in the last two years show great promise for successes similar to the ones experienced in Japan over the last 30 years.

In case you are not aware, Japan has been a world leader in enhancing the yields of wild scallop fisheries, having raised fisheries production from about 20,000 to 200,000 tonnes per annum.

Something else you should know, the people involved in this initiative in les Iles-de-la-Madeleine do not really care if they are called fishermen or aquaculturists as long as their drags are full of scallops when they harvest.

This type of juvenile stocking is very similar to the salmon enhancement technology practiced in Alaska. I do not have to explain to you the huge contribution salmon hatcheries are making to the production of wild salmon in Alaska.

In 2001, my office commissioned a report on the *Economic Potential of Sea Ranching and Enhancement of Selected Shellfish Species in Canada*, which highlighted the fact that sea ranching fisheries of five Pacific shellfish species and four Atlantic shellfish species could eventually generate a landed value in the range of $1.0 to $1.5 billion annually on Canada's Pacific and Atlantic coasts. These fisheries would create or stabilize thousands of jobs, and strengthen many coastal communities

The third example is the practice of live-catch being used by some salmon and halibut fishermen here on the Pacific Coast.

A small number of salmon fishermen have been experimenting with the practice of delivering salmon live to the processing plant. They have developed a live-capture technique using a small-meshed tangle net rather than an ordinary gillnet. Because the salmon are tangled and not gilled, they can be put in a live tank for temporary storage. Fish quality can be greatly improved through a claming period in the tank and then slaughtered onshore just before the fish is shipped to market – a practice already highly developed in aquaculture.

Seiners have already demonstrated that they can harvest sockeye without harming coho and some gillnetters have seen the benefit from using the live-capture tangle net. The better quality fish command better prices, especially in the restaurant sector, and could develop a niche in the market place if sufficient supply could be provided.

Development of this live-catch practice may encourage processors to adopt methods that will enable a greater supply of high-grade, fresh wild salmon to consumers.

Some fishermen have also experimented with capturing wild halibut and sablefish and holding them in pens until market conditions are right and then selling them.

Live-capture and fresh-slaughter fisheries have a number of challenges to overcome, both logistical and regulatory, but the demand is there for the product, especially in Asian markets. Countries such as Australia and Chile are already practicing live-catch and this trend is predicted to grow.

In British Columbia, the Live Marine Fish Research Society was organized in 2001 to support and promote a live marine fish industry in British Columbia. The Society's goal is to identify and promote research and development in validation, handling, health certification, nutrition, disease, transportation, markets, containment, and hatchery and fishery-based culture.

The attraction of live-catch and fresh-slaughter is the premium prices and quality that can be obtained. However, it goes against the volume harvesting and processing technologies of the large fishing and processing operations. But if the objective is economic diversification and sustainability in fishing communities up and down the coast, then perhaps we need to find a way for this practice to take hold and grow.

I see fishing and aquaculture as part of a continuum, beginning with fishing and progressing to culture-based fisheries (also known as enhancement), fisheries-based culture (also known as catch and growout), and ending with full-cycle aquaculture. There are a number of places along this continuum that fishers and aquaculturists can meet. As I have already outlined, some people are already doing it.

I would like to go back the question I posed near the beginning of my talk: What has brought us to this point in time, where fishing and aquaculture are facing each other as opposing sides in the same purpose – to provide fish and seafood protein to feed people around the world?

In a phrase – it is resistance to change and a failure to come to grips with the reality of our time.

Consider the facts:

- The world's population is expected to increase some 36 percent, in the years 2000 to 2030, from approximately 6.1 billion people to 8.3 billion.
- By 2030, estimated total seafood demand will be 183 million tonnes, but the estimated supply will be only 150 to 160 million tonnes.
- Global capture fisheries will be able to provide only 80-100 million tonnes of fish annually on a sustainable basis.

Do the math. There is a sizeable gap. And all the experts agree that this growing demand for fish is a solid consumer trend that is here to stay and that aquaculture is the only way to fill the gap.

Today, aquaculture represents 29 percent of the volume and 39 percent of the value of global fish landings. By 2030, it will be the dominant source of fish and seafood, according to the FAO.

To quote from the same US Department of Commerce report as mentioned previously:

"Many fisheries scientists and managers are now beginning to recognize that fisheries management and aquaculture development are complementary, and are essential joint elements of a much-needed strategy for creating sustainable fisheries for national seafood security. Nationally, they should therefore be developed in parallel and not as independent sub-sectors."

Consider the benefits of marine aquaculturists and fisheries working in collaboration:

- Increased food production, more jobs, and higher earnings from goods and services.
- Cultured products that can alleviate fishing pressure on some overfished stocks.
- Research on life cycles, behavior and maintenance in captivity that can provide scientific understanding for better stewardship.
- Ecosystem benefits from extensive polyculture and enhancement systems.
- Development of aquaculture technologies that are potentially valuable tools for fisheries management.

It is evident from the growth of seafood production in many countries around the world that successful development depends on close cooperation between fishers and fish farmers. Collaboration is the only way that we will be able to meet the increasing protein demand facing the world.

Before closing, I would like to share with you a thought that I had last summer upon returning from Aqua Nor 2003, the big aquaculture show held in Trondheim, Norway, every second year. This thought came to me after co-chairing an important collaboration workshop with our Norwegian government counterparts and after having informal discussions with Chilean colleagues to hold a similar collaboration workshop in Chile early next spring.

In the plane coming back home, I made a note to raise this point with you today: How come we, in Canada, have developed extended relationships with countries like Norway and Chile but have not done the same with our closest neighbor and greatest economic partner, the United States?

The same is probably valid from your perspective. In others words, isn't it time to correct this situation, and to start a real cooperation, not only between the fisheries and aquaculture sectors in both countries, but also to start exchanging and collaborating between our two countries to develop the best strategy to serve this incredible market for fish that we have here in North America, and to reap the tremendous benefits from our rich ocean resources through an integrated fisheries and aquaculture sector and through environmentally sustainable practices that can be exported all over the world.

In conclusion, I will agree with you that the coming of age of aquaculture has provoked a real earthquake in the fishing industry all over the world, and especially in our two countries. But, I would like to suggest that it is time to put to work the fundamental character of Americans that made life in the new world possible, and that is adaptability. It is time to take stock of aquaculture and adapt our way of producing fish through an intelligent mix of sustainable fisheries and sustainable aquaculture. This in turn will end-up in producing more fish, in better quality and commanding a higher price and producing more benefits for our communities, while at the same time protecting more of the wild environment. It is time to stop arguing about the

number of jobs aquaculture produces versus the number of jobs fisheries produces. One does not exclude the other. It is all the jobs provided by both aquaculture and fisheries sectors that are urgently needed in our communities today.

We need to remember that we are in the seafood business, and that our goal is to feed people with the best products that we can produce.

Thank you.