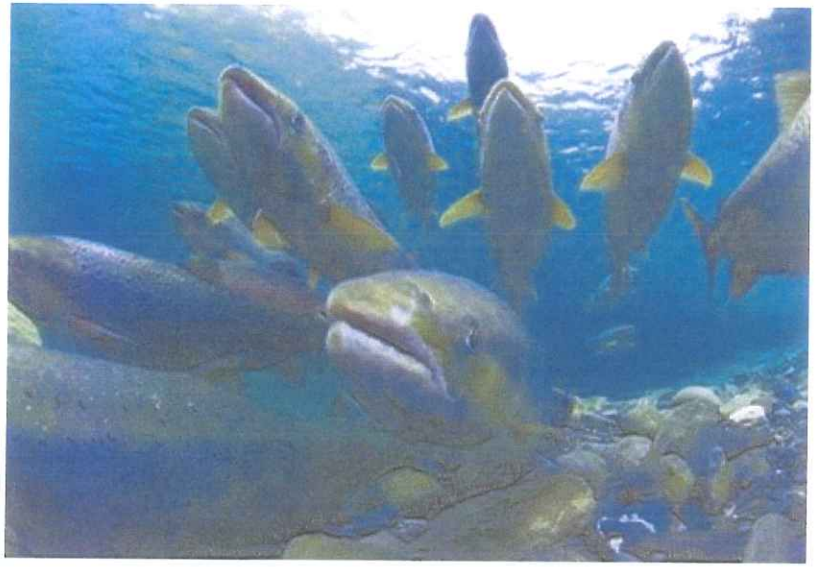
Misinformation & Rhetoric: Setting the Record Straight

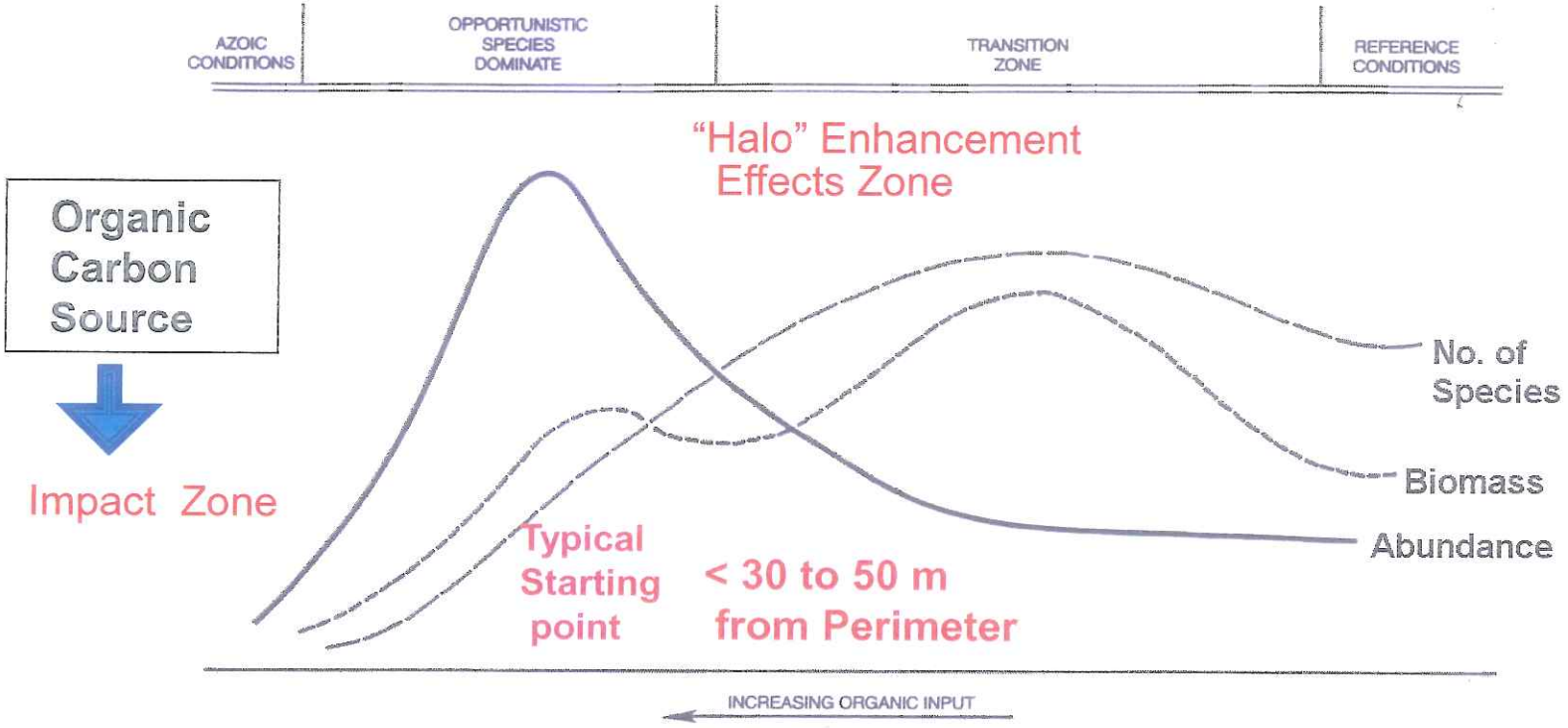
Top 10



Myth #1: Salmon farms are polluting the ocean

- All fish, wild and farmed, produce dissolved and particulate waste.
- Fish waste (wild and farmed) contains organic carbon and small amounts of nitrogen and phosphorus plus trace minerals, all essential for life.
- Farmed salmon are the proverbial canary in a coalmine. They would suffer first if water quality is compromised.
- Properly sited farms have little, if any, negative impact on the environment. Nutrients are dispersed & aerobically assimilated by the food web to increase productivity.
- 2007 NOAA-Sponsored *Beneficial Environmental Effects of Marine Finfish Mariculture* Report states:
  - "The popular media-distributed notion of fish-farming habitats often suggests a biological wasteland heavily impacted by fish feces, waste feed, antibiotics and chemicals. Nothing could be farther from the truth for Washington state fish farms and those of the state of Maine."

Organic Carbon Sediment Enrichment "Effects vs. Impacts"



No measurable effects

Source: Pearson and Rosenberg 1978

Adaptation by: Jack Rensel, referring to typical Puget Sound net pen

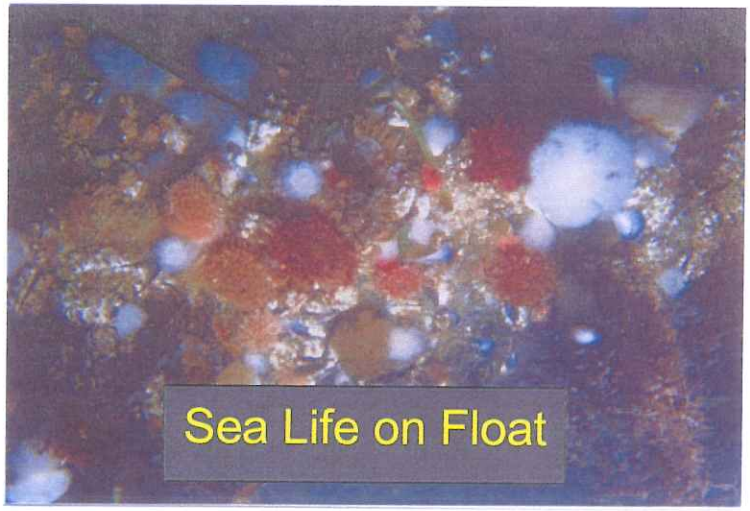
Myth #1: Salmon Farms Pollute the Ocean

- Study showed that a typical fish-pen system in Puget sound is populated by more than 100 species of seaweeds and invertebrates

Tube Worms on Rope

New study describes environmental benefits of marine net-pen systems

Contrary to many mass-media reports, properly sited and operated salmon farms provide an enriching and diverse habitat for a variety of marine organisms



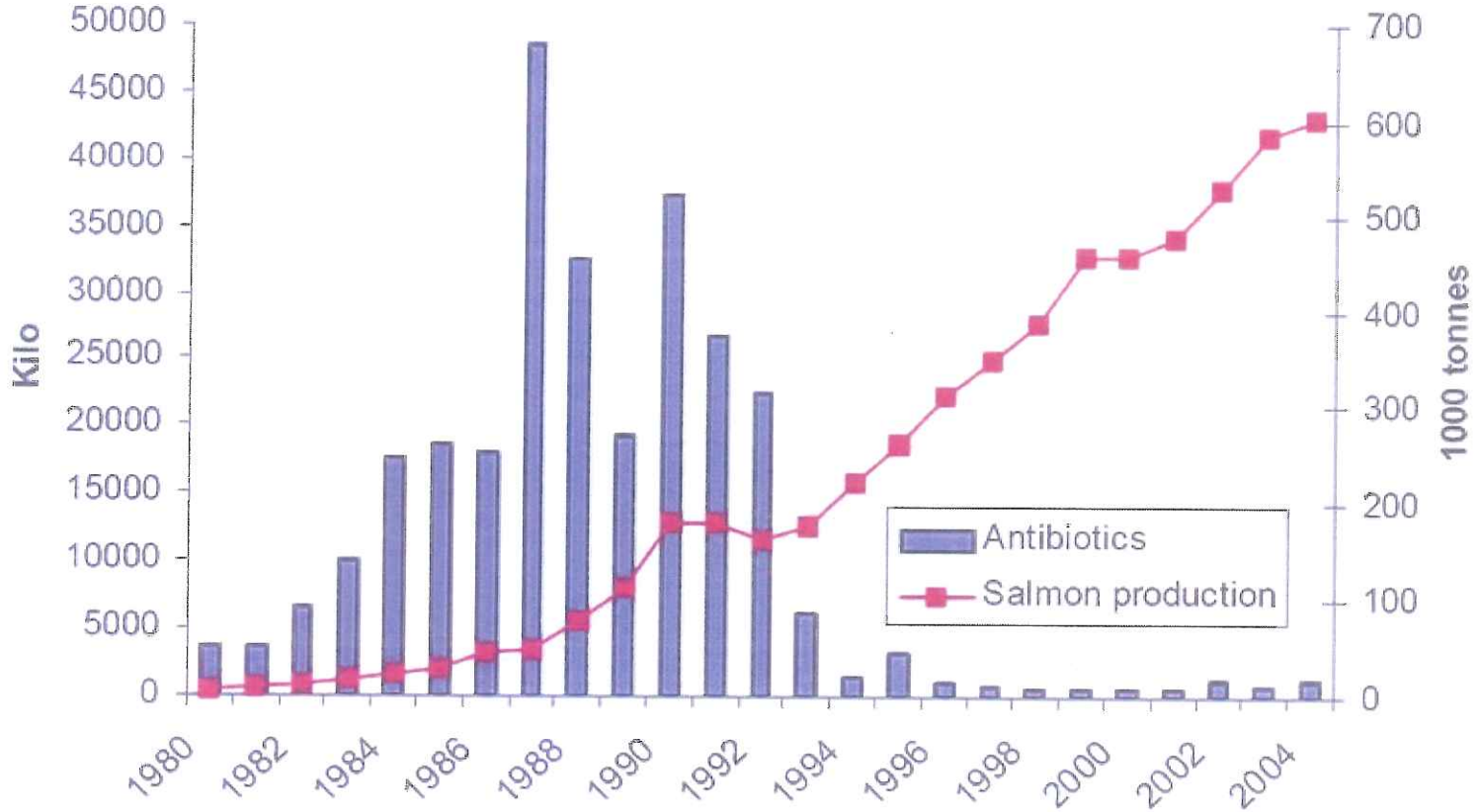
Sea Life on Float

Source: Rensel & Forster 2007

Myth #2: Farmed salmon are pumped full of hormones and antibiotics

- Farmed salmon are not fed or injected with growth hormones.
- Antibiotics are rarely used, will slow fish growth and if they are required are prescribed by Veterinarians. Vaccines are used instead, simple swim through process.
- Livestock are on low dose antibiotics for more than 50% of their lives whereas only 3% of salmon feed is medicated.
- Many salmon farms are completely antibiotic free, every year.
- When compared to land-based farmed animal production salmon farming uses far less amount of antibiotics (DFO)

Use of antibiotics in the Norwegian salmon farming industry, 1980-2004



Antibiotics use at U.S. marine fish farms < about 100 kg per year
vs. 50 million pounds for agricultural and human medicinal (USCDC)

Myth #3: Salmon are dyed with artificial chemical to make it look like wild fish

- Salmon are not injected with dyes or artificial colors.
- Naturally occurring pigments called carotenoids are added to salmon feed. This gives salmon their distinctive color.
- Salmon, like people, need these pigments for healthy growth and must get these nutrients through their diet.
- Pigments include astaxanthin and canthaxan
- Tanning Pills (www.tanningpills.com)

That "Back from Vacation Look" Sun or UV-rays Not Required.

Myth #3: Salmon are dyed with artificial chemical to make it look like wild fish

Health Benefits:

- Reduces inflammation by quenching reactive oxygen species.**
- Protects cell and mitochondrial membranes from oxidative damage.**
- Dramatically decreases DNA damage.
- Crosses the blood brain barrier,** and may assist in maintaining neurological health.
- Boosts the immune system by increasing the number of antibody-producing cells.*
- Stimulates the immune system by increasing the total number of T-cells.*
- Inhibits lipid peroxidation that may cause plaque formation in the circulatory system.
- Prevents the initiation of tumorigenesis in the tongue, oral cavity, large bowel, bladder, and breast.**
- Protects the eyes and skin from UV A and B damage by quenching singlet and triplet oxygen.**
- Reduces the number of new and abnormal cells in the liver.**

**Confirmed in human clinical studies.*
***Confirmed in pre-clinical studies.*

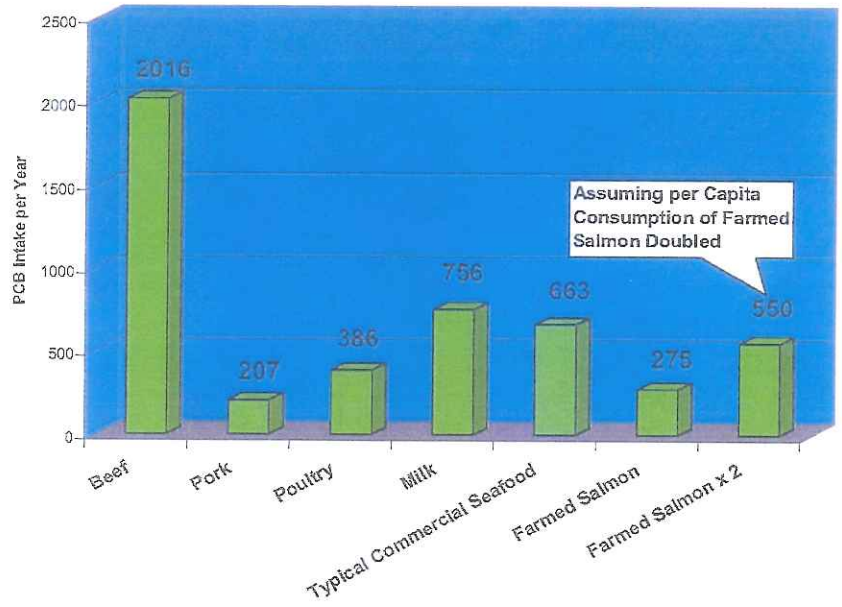
Myth #4: Farmed salmon contain high levels of cancer causing PCBs

- ENGO funded *Nature* published study of salmon PCB content by Hites et al. compared European Atlantics (fed contaminated local forage fish with Alaskan chum and pinks that were much lower than chinook and sockeye). Uneven and unfair comparison and lumped all farmed fish in the conclusions.
- Framed atlantics had 6.75 – 7.5 ppb vs. wild Alaska sockeye & chinook with 10 ppb & 8.2 ppb (Pan Fish Canada Ltd 2006 and ADEC Alaska)
- Other study: farmed salmon 11.5 ppb vs. Copper River Sockeye 67ppb – 791ppb (SOTA & Circumpolar Conservation Union)
- CFIA / FDA tolerance is 2,000 ppb
- Fish meal & oil sourcing now more focused on contaminants (no menhaden meal) – also, increased substitution of fish meal in salmon diets with soy, other cereal crops

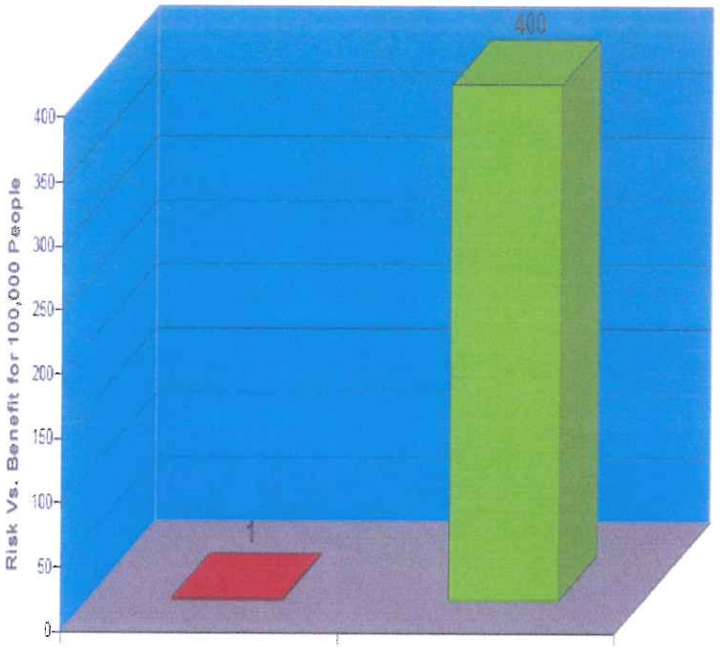
Myth #4: Farmed salmon contain high levels of cancer causing PCBs

- American Heart Association states that eating oily fish reduces the risk of fatal hearth attack by 50%

Annual Per Capita Intake of PCBs by Food (Based on Environmental Working Group Report, July 30, 2003



Comparison of Health Risks and Benefits from Eating Farmed Salmon



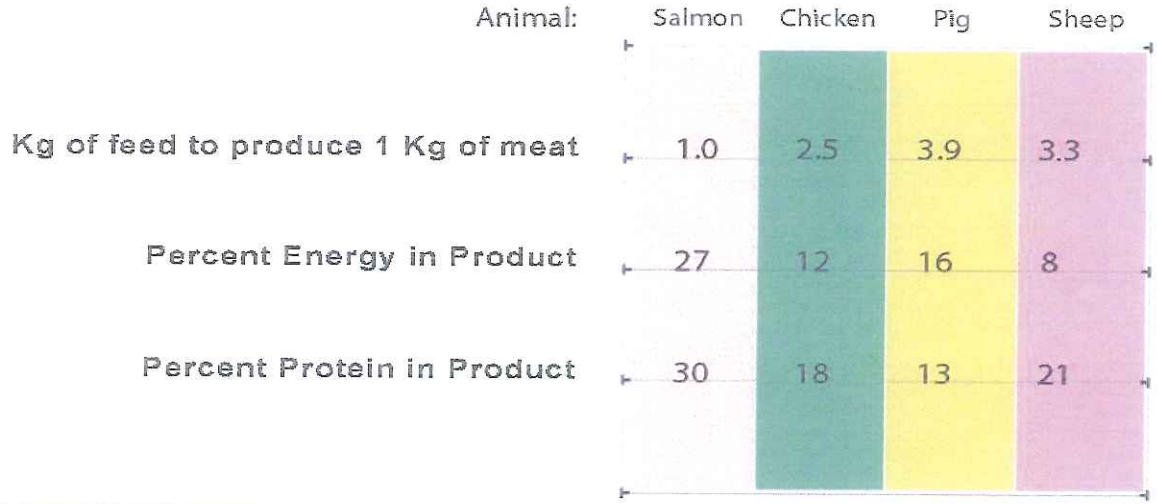
Myth #5: Escaped farmed Atlanitc's are killing wild salmon stocks

- 2001 NOAA policy report concludes there is little or no risk that:
  - Escaped Atlantic's will hybridize with Pacific Salmon
  - Atlantic's will colonize habitants in the Puget Sound
  - Atlantic's will prey on Pacific Salmon
  - Cultured fish stocks will be a vector of exotic pathogens
  - Antibiotic-resistant bacteria will develop in net-pen salmon farms. Similar antibiotic resistance in Pacific salmon hatcheries has not been shown to have a negative impact on wild salmon.
- Between 1905 and 1935 BC released 8.5 million AS into local rivers & lakes. These releases were not successful in establishing populations in the Province.
- At least 170 attempts occurred in 34 states. None of these efforts was successful.
- Millions of AS released all over the world, no runs could be established, highly documented and published information.

http://www.nwfsc.noaa.gov/assets/25/4283_06162004_141612_tm49.pdf

Myth #6: It takes 3 to 4 tonnes of wild fish to prod. 1 tonne of farmed salmon

- Fishmeal fed to farmed salmon is made from trimining in fish processing plants, from fish that are not suitable for human consumption, and from fish that humans do not desire to eat
- Fish used for fishmeal production are caught in sustainably managed fisheries; the Chilean/Peruvian anchovy fishery is one of the worlds most highly regulated and sustainable, native peoples in those areas do not use these fish at all.
- Farmed fish grow efficiently compared to other farmed animals. They are cold blooded and live in a near weightless environment.



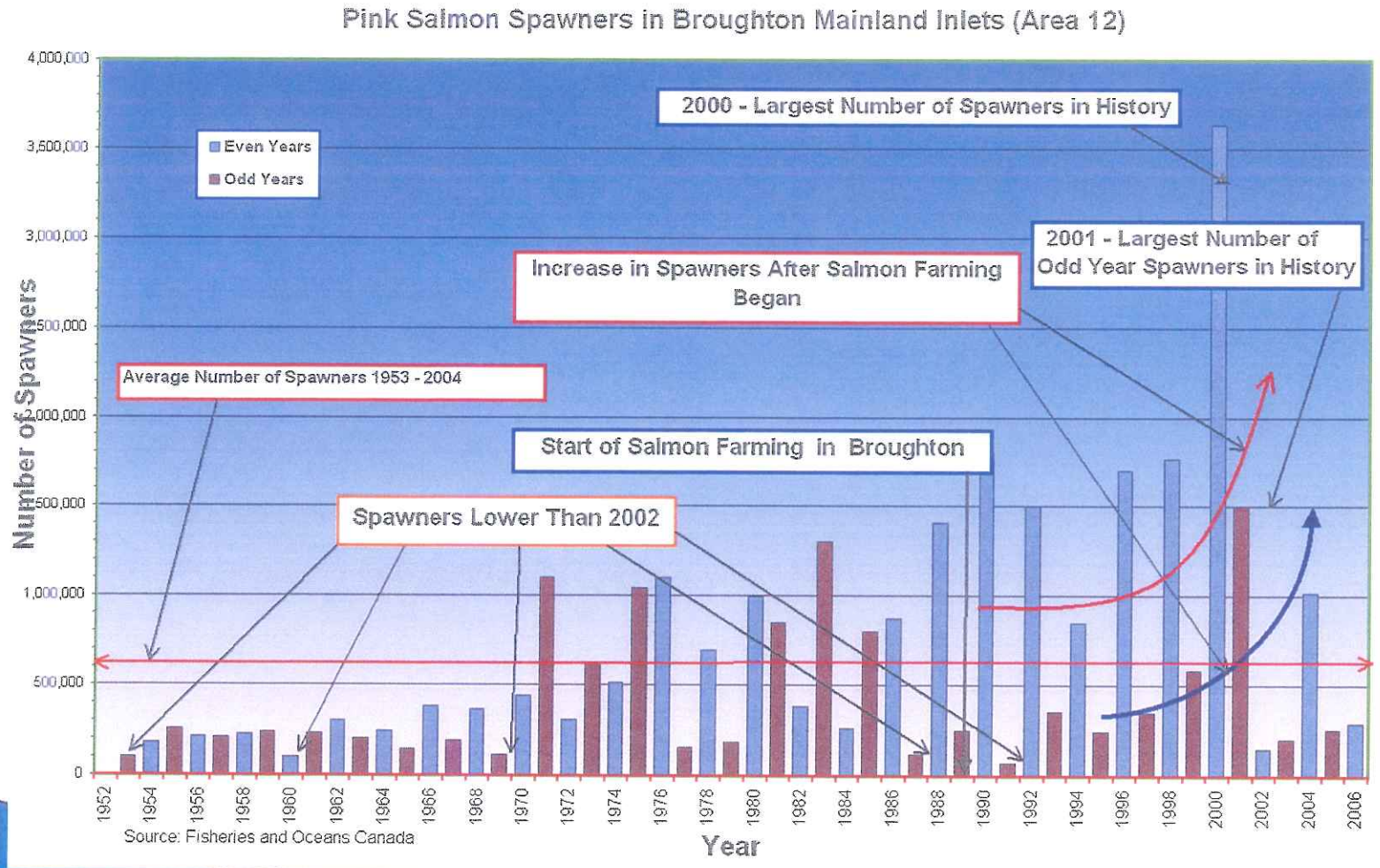
Myth #6: It takes 3 to 4 tonnes of wild fish to prod. 1 tonne of farmed salmon

- Grower diet contains 22% fish meal / 13% fish oil
- 10% meal + oil comes from 'by - products'
- Therefore : grower diet contains (per tonne) 198Kg meal + 117Kg oil from wild caught fish
- At FCR 1.15 : 1 tonne of farmed salmon requires:
  - 228Kg Fish meal (198 x 1.15)
  - 135Kg Fish oil (117 x 1.15)
- Wild caught fish : fishmeal yield 5:1
  - 228Kg Fish meal requires 1,140Kg wild caught fish
- Wild caught fish : fish oil yield 8:1
  - 135Kg Fish oil requires 1,080Kg wild caught fish
- **1.14 tonnes of wild caught fish to produce 1 tonne farmed salmon**

Myth #7: Wild salmon are being killed by sea lice from salmon farms.

- Sea lice are a naturally-occurring species found in every ocean and on many varieties of fish.
- Activists cite low returns of pink salmon in 2002 as proof that a sea lice infestation has caused a "crash" in the pop.
- There were 5 years before 2002 when fewer pink salmon spawners were recorded (53, 60, 69. 87, 91). No salmon farms in 3 of those years.
- Are fish farms in the Broughton causing the dramatic increase in sea lice levels?
  - "This is unlikely. Sea lice were not originally a salmon-farming phenomenon. Sea lice have existed on wild salmon for tens of thousands of years before the first salmon farm was established in Canada and wild salmon have adapted to them." Department of fishery and Oceans (http://www.dfo-mpo.gc.ca)

Myth #7: Wild salmon are being killed by sea lice from salmon farms.

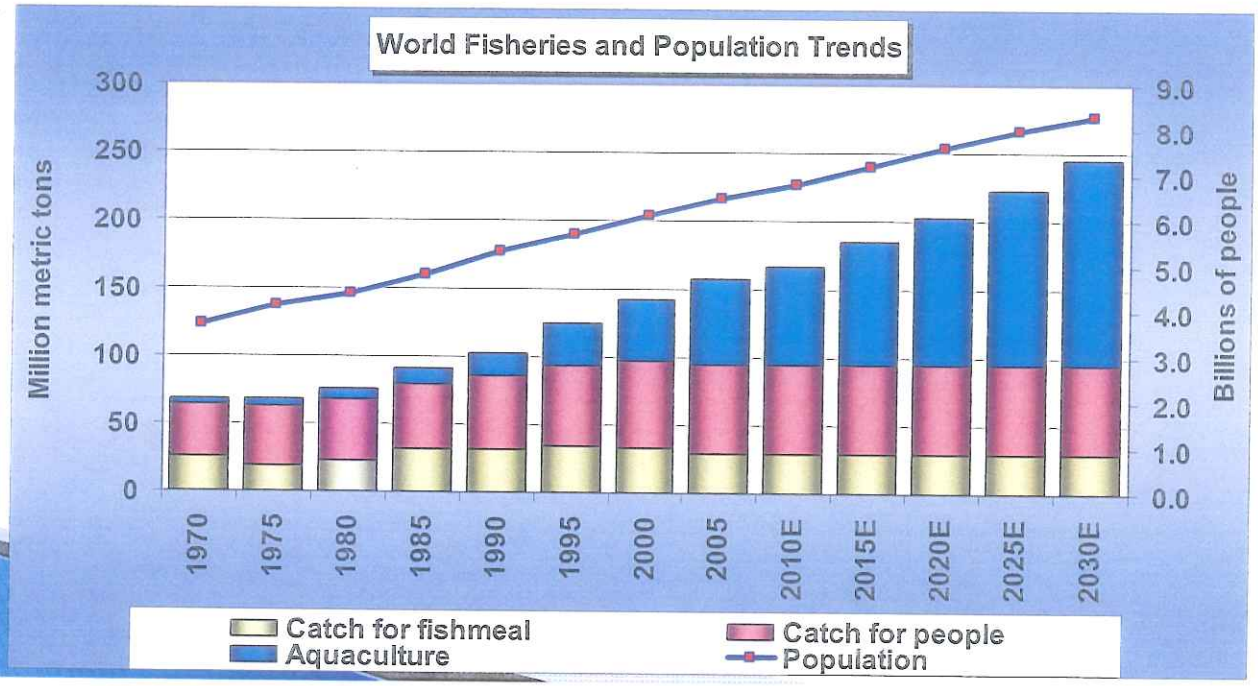


Myth #7: Wild salmon are being killed by sea lice from salmon farms

- In 38 years of operation, never a serious or prolonged problem with sea lice in Puget Sound fish farms
- No physical evidence that lice on farmed fish in B.C. are shedding mobile phase out of cages
- Extensive DFO monitoring simply finds it is not a source
- ENGO funded "studies" and "modeling" are entirely hypothetical and highly flawed in design
- Very thinly disguised junk science being propagated by the Suzuki Foundation, Pew Trust and other NGOs that make over $100 million annually based on this rhetoric.

Myth #8: Consumers are doing the environment a favor be eating wild and boycotting farmed

- How does eating weak wild salmon stocks help to save them?
- Supporting the salmon farming industry can help take pressure of wild salmon stocks and conserve weak wild stocks
- Wild fishery catches are at their limit (80 MMT). Future shortfall will have to come from sustainable aquaculture.



Myth #9: Salmon farms spread disease to wild fish

- Only disease free salmon smolts are stocked into net pens.
- Smolts are vaccinated to prevent from getting disease from wild fish or naturally occurring pathogens.
- If a disease outbreak occurs in a net pen they can be treated and cured.
- Wild fish that get disease transfer the disease to other wild and to farmed fis
- Any disease that farmed salmon get ar from the naturally-occurring pathoger or from wild stock but this is rare.
- In the Strait, this was found to be true and published by Deardorff and Kent. 1989.

Prevalence of larval *Anisakis simplex* in pen-reared and wild-caught salmon (Salmonidae) from Puget Sound, Washington. Journal of Wildlife Diseases. 25:416-419.

Myth #10: Closed containment system should be used to farm salmon

- Closed containment requires pumping of large amounts of water. This requires significant electrical power that is generated by fossil fuel. Significant carbon foot print.
- Capital costs are huge, e.g., 10,000 tons of salmon per year would need tanks = to 10 football fields 10 meters deep.
- Pump of at least 400,000 cubic meters per hour (this equates to one exchange per hour based on fish density of 25 kg/m^3). Power to generate this is approx 16,000 kw/hr. If one is paying 0.07/kwhr then the cost to pump the water is approx $10 million per year. Tidal power in the oceans is free and reliable!
- The operation would need supplemental oxygen and a backup generator capable of running pumps if a power failure occurs.
- On shore farms have been economic disasters where ever tried.