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January, 2002

# Exotic Aquatic: The Culturing of Native vs. Exotic Species: A Dilemma

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Available at: <https://works.bepress.com/paula-furey/19/>

Leonardo Da Vinci noted that “he is a poor mentor who is not surpassed by his students.” If mentors (i.e., teachers or professors) are to encourage their students to explore the world we share, they must ensure that every avenue for discovery is celebrated. That the society students are inheriting has changed more in the past two decades, than in the previous eight, is indisputable – it has become a world many of us have increasing difficulty in recognizing and understanding. Predicting how students will be required to function in the near term is at best a difficult process, at worst an impossible one. Perhaps one of the most distressing issues they must contend with will be the preservation and protection of those ecosystem services crucial to maintaining Western civilization.

We must find new avenues for making the findings of science, especially ecology, understandable to the broadest possible audience (both scientists and nonscientists). If we can use an unorthodox means – such as poetry – to convey our messages and our understanding of the world we have had revealed to us through science, then encouraging students to employ nontraditional vehicles of expression will hopefully enable them to cross beyond those boundaries that historically have constrained so many of us.

In a fourth year course in aquaculture (at the University of Victoria) focusing on the ecology and philosophy of current and traditional cultivation and enhancement practices of aquatic biota, instructor Patrick Lucey posed the following examination question: “Are the economic benefits worth the environmental risk when culturing exotic species?” With no limitations or boundaries, students were encouraged to choose a response that they believed effectively communicated their understanding of the issues. The following original poem was the composition choice of one of his students.

# Exotic Aquatic

## The Culturing of Native Versus Exotic Species: A Dilemma

PAULA C. FUREY

### EXOTIC AQUATIC

One fish<sup>(1)</sup>

Two fish

Three fish

Four ... eigh fish

Or oysters, or seaweed, whatever you wish!

Economics is a reason for exotic introduction –

Cheap, fast growth, good taste, and greater production.<sup>(9)</sup>

Higher density of product this method does get,

Harvest is easy, and handling no sweat,

Temperature tolerance and hardiness increased,

Consumer acceptance and marketability feast.<sup>(8)</sup>

Introductions to establish fisheries – commercial and sport,

For sale on the market, or to feed the higher court.<sup>(9)</sup>

*Tilapia* that Christ fed the multitudes, and Saint Peter caught,

Now brings a better price than the carp we traditionally sought.<sup>(8)</sup>

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Brown trout introduced from Europe is U.S. fishing salvation.<sup>(6)</sup>  
Exotics, they say, could feed the whole nation!  
Pacific oyster, *Crassostrea gigas*, introduced in 1913,  
Are the best foreign oysters BC's yet seen.<sup>(6)</sup>

Then there's *Protothaca stamine*, the manila clam that's been here for years,  
A potential polyculture with oyster – everyone cheers!\$!<sup>(10)</sup>  
Culturing exotics seems so cost effective;  
Getting the most for the least, that's the objective!  
If I can get more money for an exotic per pound,  
To say no – I'd be the craziest person around!  
Production response is directed by consumer demand.<sup>(2)</sup>  
They want exotics, not fish from the homeland.  
With the cheapest, fastest best fish on the world market,  
I'll keep money rolling in on that fancy red carpet.  
But wait ... WAIT, I'm thinking short term.  
Exotics aren't the answer, when will I learn?  
Linked to the environment and its long term well being,  
No environment, no economy, a crucial connection I'm now seeing.  
It is said that exotics will not escape into the water,  
Or the organism is sterile and could produce no daughter,  
Or if it escapes it could not survive,<sup>(7)</sup>  
But here in B.C., Atlantic salmon are alive.<sup>(5)</sup>  
Grass carp, said to be safe to culture in the U.S.,  
Now occupies Missouri and Arkansas rivers, they confess.<sup>(11)</sup>  
Should we trust that *Tilapia* can't survive in the cold,  
Or that freshwater shrimp must be warm because we're told?<sup>(11)</sup>  
Remember the water environment can trick thee,  
Won't be long, till there's an exotic escapee.<sup>(6)</sup>  
This exotic could be a competitor for one,  
Competing for food, habitat, or an old spawning run.<sup>(7)</sup>  
There could be competitive displacement and genetic repercussion;<sup>(7)</sup>  
Native mussel, seaweed, or fish lost without discussion.  
What a strain on the ecosystem and the native source,  
So interconnected, have they no remorse?  
The exotic escapee could be a predator too.  
How much will it eat? What will we do?

Attacking,  
Eating,  
Eventually depleting.  
In the Philippines, take Lake Tanao for example,  
For hundreds of years, native fish there were ample.  
Replaced by exotics, the native fish beat,<sup>(4)</sup>  
The indigenous people cry out in defeat.  
So many native cyprinids lost to predatory fish,  
Will they again catch a good protein dish?  
Nature once more several species poorer.<sup>(4)</sup>  
No exotics, no exotics, I've never been surer!  
If that's not enough, what about disease?  
Introduced by exotics with incredible ease.  
The grass carp, introduced to Europe from the Far East,  
Brought a cestode who is now having a feast.<sup>(8)</sup>  
Ferunculosis in the UK introduced with brown trout,  
Now in Norway, disrupting aquaculture no doubt.<sup>(8)</sup>  
That won't happen, they say; we screen eggs and test,  
Set up regulations, all to avoid any possible pest.  
But there is no way to be 100% sure;  
The effects are irreversible and will endure.<sup>(3,7,9)</sup>  
So why take this chance when you know it is wrong?  
Economics of culturing exotics simply won't last long.  
What if the exotic establishes itself, or interbreeds?  
These are the things on which disaster feeds.  
The state of water ecosystems is more fragile these days,  
With dams, huge fishing ships and our polluting ways.  
Sure, evolution of aquatic organisms rose from ecosystem change,  
But now the scale is bigger and over a shorter time range.  
You don't know what exotic organisms will do,  
They eat, defecate and eventually die too.  
What are they affecting, how far down the chain?  
That ecosystem will never be the same again.  
Or perhaps that system is already dying, they say;  
But will adding an exotic make it okay?  
It's still no excuse to think exotics are best.  
It's all irreversible, and there's no way to test.

If waters are over fished without care,  
 Adding exotics won't fix the root problem there.  
 It's in your best interest, I think you'll find,  
 If native stocks are gone, the public will mind.  
 Eco-friendly products at the market to promote  
 Without the disease and predation exotics tote.  
 You don't want your money where irreversible events mix,  
 The mistakes alone would be too costly to fix.<sup>(12)</sup>  
 In the long term it's more economically viable  
 To have an aquatic environment that is reliable.  
 How can we claim to understand an exotic aquatic so,  
 When our native species, barely do we know?  
 When the effects can't be undone and the damage so great,  
 The consequences awful, and the risks so high rate,  
 Why take a chance on something uncertain?  
 Draw the limits at exotics, don't draw the curtain.  
 Make it **HOME GROWN!!**  
 Not **EXOTIC AQUATIC!!**

## Acknowledgments

The author wishes to thank Wm. P. Lucey for his contribution, time, endless support, and guidance; without whom boundary-free exploration would not have been possible!

## References

1. The use of the terminology *fish* is for fluidity in the poem. It is meant to refer to any aquatic organism, including seaweed, and invertebrates.
2. Allen, P.G., Botsford, L.W., Schuur, A.M., & Johnston, W.E. (1984). *Bioeconomics of Aquaculture*. New York: Elsevier Science Pub. Co. Inc.
3. Barel, C.D.N., Dorit, R., Greenwood, P.H., Fryer, G., Hughes, N., Jackson, P.B.N., Kawanabe, H., Lowe-McConnell, R.H., Nagoshi, M., Ribbink, A.J., Trewavas, E., Witte, F., & Yamaoka, K. (1985). Destruction of fisheries in Africa's lakes. *Nature*, 315(2), 19-20.
4. Bleher, B. (1995). Lanao. *Aquageography*, 10, 6-30.
5. Castledine, A.J. (1991). *Atlantic Salmon in the Northeast Pacific, Aquaculture Factsheet 30*. Available from Ministry of Agriculture Fisheries and Food, Victoria.
6. McLarney, W. (1984). *The Freshwater Aquaculture Book*. Vancouver: Hartley and Marks Ltd.
7. Orians, G.H. (1989). Environmental issues in aquaculture: a conversation with Donald Weston. *The Northwest Environmental Journal*, 5, 125-139.
8. Pillay, T.V.R. (1992). *Aquaculture and the Environment*. Toronto: John Wiley and Sons, Inc.
9. Pillay, T.V.R. (1990). *Aquaculture Principles and Practices*. Victoria, New York: Halsted Press.
10. Pritchard, G.I. (1984). *Proceedings of the National Aquaculture Conference*. Minister of Supply and Services Canada, Ottawa.
11. Stickney, R.R. (1979). *Principles of Warmwater Aquaculture*. Toronto: John Wiley and Sons.
12. Tsur, Y. & Zemel, A. (1995). Uncertainty and irreversibility in groundwater resource management. *Journal of Environmental Economics and Management*, 29, 149-161.