briefing / sustainable fishing vessel design

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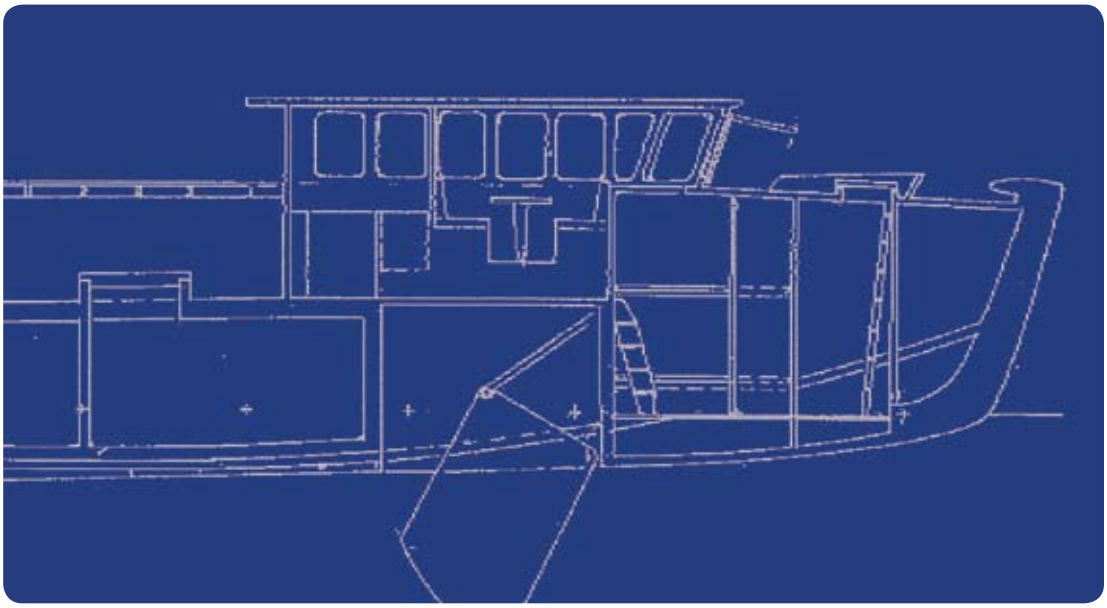

BLUEPRINT / Phil Bolger & Friends, a Gloucester, Massachusetts-based boat designer, applied sustainability principles to the design of this 70-foot fishing vessel prototype. Ecotrust Canada funded a project to have Bolger explore sustainable vessel designs for the BC commercial fishery.

Sustainable Fishing Vessel Design

FISHERIES / Quota leasing and soaring oil prices are squeezing the bottom line of fishermen. An innovative design for a new low-cost, fuel-efficient vessel could be good news for both the environment and industry, reports Ucluelet fisherman **Dan Edwards**

In British Columbia over the last decade, small-boat fishermen have faced a "perfect storm" of government buy-back schemes, industry consolidation, vertical integration, slumping salmon prices, stricter conservation rules, soaring monitoring and quota costs, and a gale of licensing and regulatory reforms. It's a wonder that any of us remain afloat.

Now, with our margins squeezed, we face rising fuel costs and the need to replace aging vessels. My own boat was built in 1927 out of old-growth fir that is no longer available. These factors—and growing consumer demand for "greener" seafood—mean we need to invest in more sustainable technologies and vessels.

At the same time, some people in government and industry continue to sing the mantra that "bigger is better." Consolidation of quota onto larger vessels is the only alternative, they say. But many of us fishermen—especially those based in rural coastal communities—believe a future exists for a highly nimble small-boat fleet that is diversified in several fisheries and that can efficiently deliver high-quality sustainable seafood products to conscientious consumers.

The problem is overcoming the operational and capital costs of the small-boat fleet in order to tap market opportunities. This took me on a search for a solution: a new fuel-efficient, low-cost vessel design. Let's call it the sustainable fishing boat.

When the commercial salmon troll fishery collapsed in the mid-nineties, a number of fishermen went looking for other fishing opportunities. While I fought for the survival

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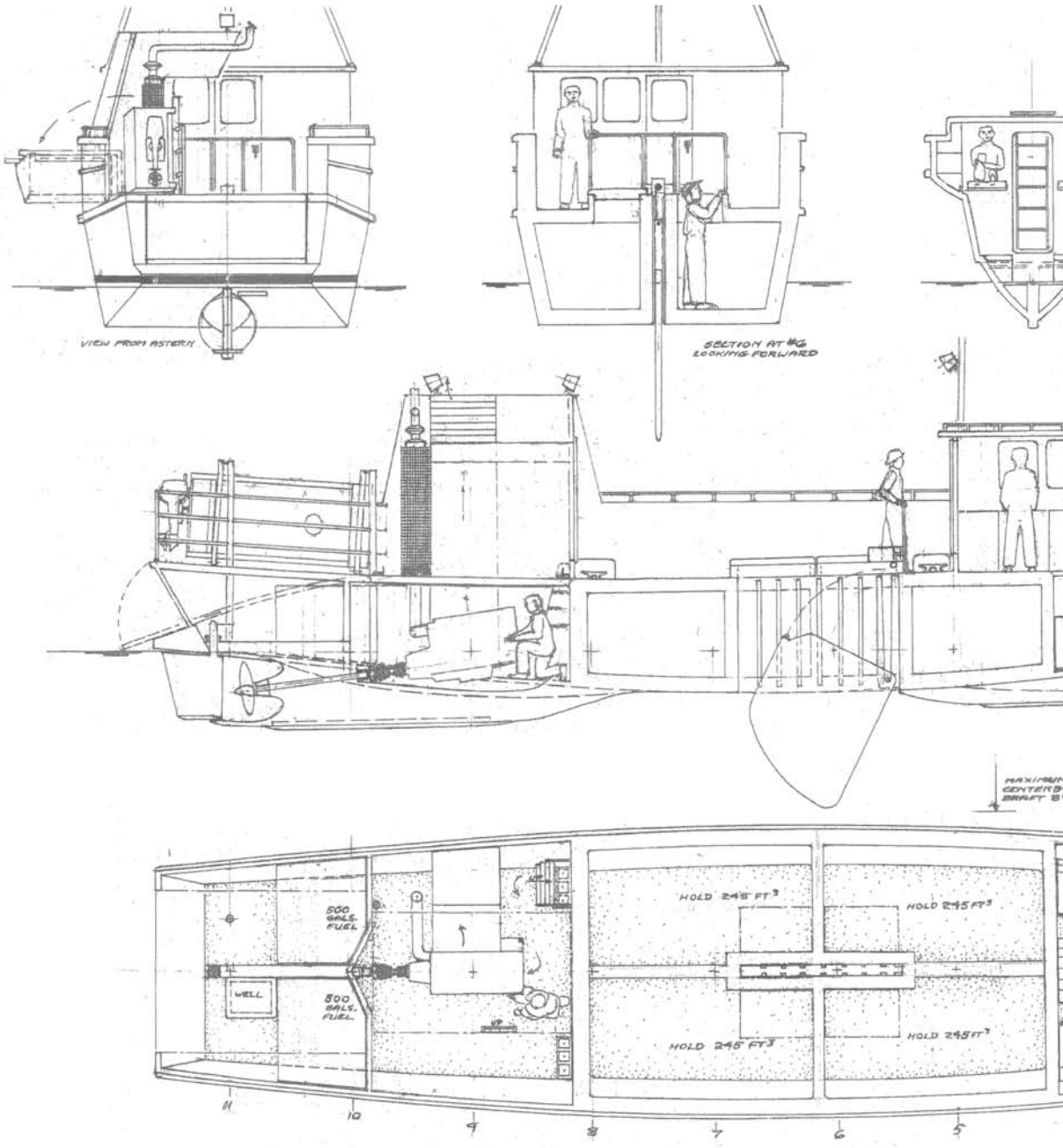
Designer's perspective

What does a sustainable fishing boat look like? We have established criteria encompassing both the ecological and socio-economic performance of the vessel. Ecological criteria include a low carbon footprint (fuel efficient) through low-resistance hull geometries and the use of largely renewable materials (i.e. eco-certified wood); and socioeconomic criteria focuses on low capital costs of construction, vessel safety, fuel efficiency to keep operating costs down, the ability to build locally with extant fishermen and a nimble design allowing fishermen to use the vessel for a variety of small-boat fisheries.

All in all, it's cheaper to build, maintain and operate—a win for fishermen and the environment. Now, regulations restricting fishing vessel length need to be changed to allow for this leaner, longer and greener design.

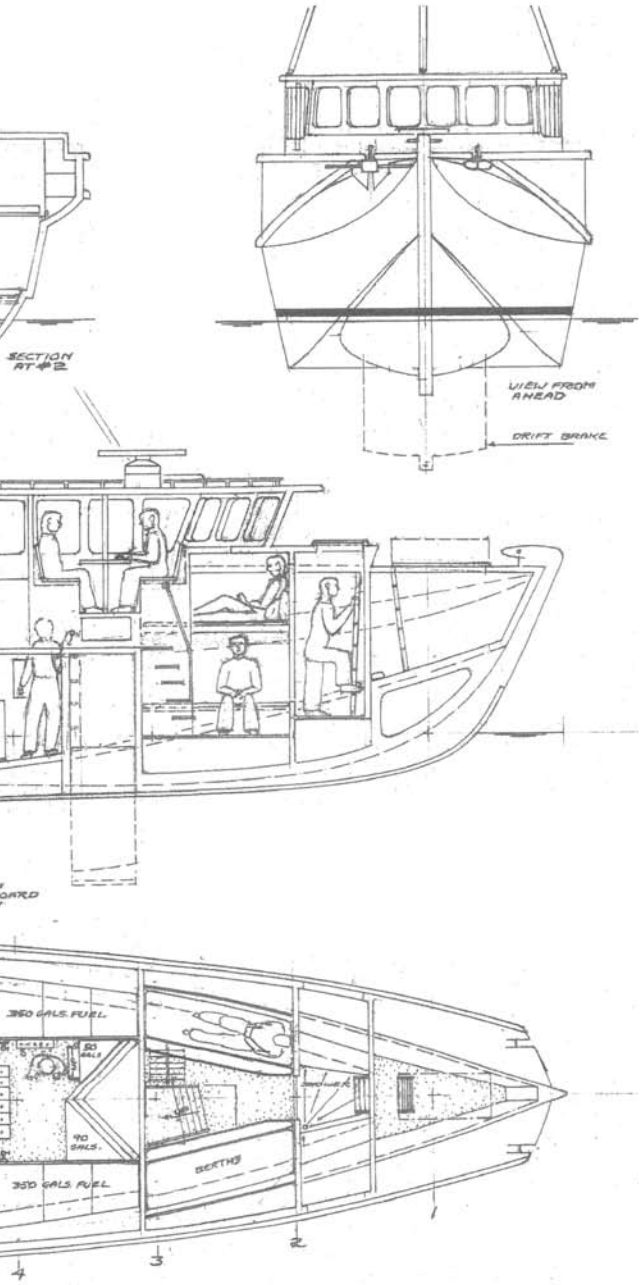
— Susanne Altenburger, Phil Bolger & Friends, Gloucester, Mass.



of small-boat fishermen in the political arena, my son Ryan took our salmon troller and went long-lining for dogfish and rockfish. He managed to keep us from going bankrupt.

Ryan could load the boat in less than twenty-four hours with 20,000 pounds of fish, but the downtime between loading, running to port, and unloading made the operation marginal. In 1998, we bought the ex-packer *Helen II*, which at 57 feet can hold 50,000 pounds of dogfish. While she has been completely refitted over her 70-year history, we continue to be on the lookout for a replacement vessel in case the time comes when she can no longer keep up with the brutal pace of our fishery, which often lasts ten months and averages thirty trips each year.

With the introduction of DFO's new integrated groundfish fishery (requiring 100 percent on-board video monitoring and quota to account for all catch), I became convinced that there could be a future for the small boat hook-and-line fishermen. The new rules made small- and medium-sized operators more sustainable—financially and ecologically—by enabling fishermen to land and market their targeted and non-targeted catch without requiring them to overcapitalize in multiple,



expensive licenses. In turn, more money could be freed up for active fishermen to invest in much-needed new vessels and gear.

BOLGER'S BOLD THINKING

In 2005 I read an article in *National Fisherman* about a sustainable boat project being developed by Phil Bolger & Friends Inc., a boat design firm in Gloucester, Massachusetts. The prototype vessel that caught my eye was a 70-foot longliner built of plywood, foam and epoxy, driven at ten knots by a 220-horsepowered diesel. The hull was designed to be built without expensive shipyard infrastructure and claimed to be very fuel efficient. The projected cost at the time was approximately $90,000, plus labour, for a finished and powered hull.

Several of their designs, in fact, have been built by amateur boat builders. I was thus very intrigued, although my wife was not at all happy when she found me pacing our backyard with a tape measure trying to figure out if I could build a new fishing boat on her lawn!

I contacted Susanne Altenburger, Phil's wife and a designer in her own right, and Ecotrust Canada, which agreed fo fund the vessel's research and development. We had already participated in Ecotrust Canada's first Climate Smart workgroup in which we calculated the greenhouse-gas emissions of our fishing operation. The carbon footprint of our vessel, with an annual catch of 1.2 million pounds, was about 70 tonnes. The vast majority of our greenhouse gas emissions come from the diesel engine powering the *Helen II.*

With crude oil soaring beyond $130 per barrel and expected to reach $200, a new more sustainable vessel could reduce fuel consumption and greenhouse gas emissions, a win for both the environment and fishermen.

Susanne travelled to Vancouver Island in the middle of a nasty wind and rain storm to investigate the adaptation of their Bolger design to the West Coast. I gave her a tour of the Ucluelet waterfront, and introduced her to the local boat builders, marine engineers and fishermen on Vancouver Island. She and Phil then spent time during the winter designing detailed blueprints for a 31-foot prototype workboat that could be built in a coastal community and tested for seaworthiness in our North Pacific conditions.

The design uses a plywood-epoxy-foam composite for the hull that is cheaper than steel and aluminum. Its simple design significantly reduces shipwright labour costs. Bolger has proven, through the operation of several working vessels, that their slender hull design allows vessels to reach speeds of twenty knots with about half the horsepower of conventional vessels of the same size.

Some design characteristics of their vessel, such as a shallow draft and drop keel, are not common on this coast, but Phil and Susanne have produced a video that shows just how seaworthy these shallow-draft vessels can be. Flat-bottom designs often provide a much better working deck than deep-draft vessels, an important consideration when fishermen

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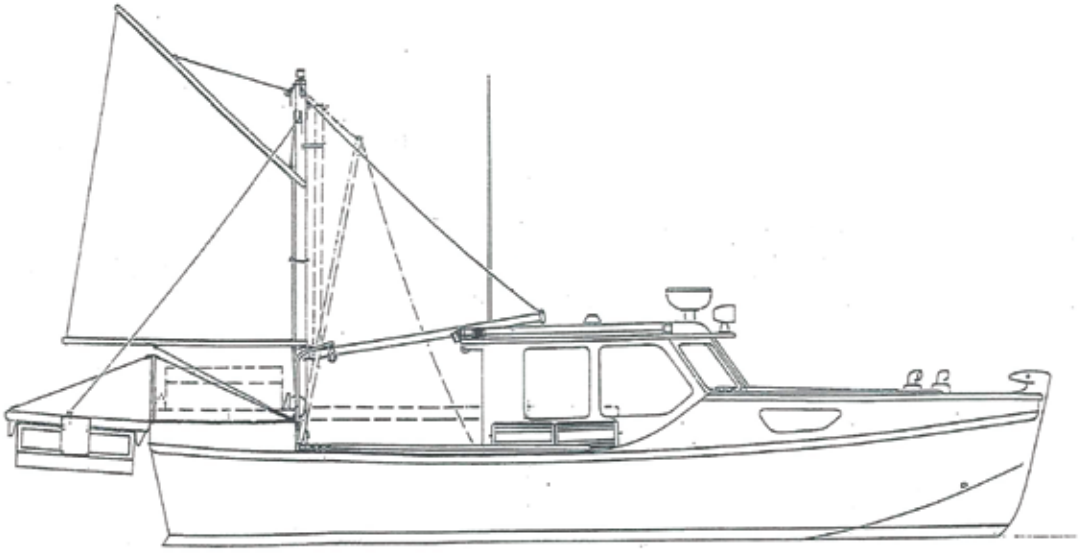
"Many fishermen believe a future exists for a highly nimble small-boat fleet that is diversified in several fisheries and that can efficiently delivery high-quality, sustainable seafood to conscientious consumers."

DAN EDWARDS,
UCLUELET FISHERMAN

BLUEPRINT / Phil Bolger & Friends designed a 31-foot prototype workboat for Ecotrust Canada based on sustainability criteria including fuel-efficiency, renewable materials, safety and low-cost, local construction.



"I'd really like to see one of these boats built."

ERIC CASWELL, SHIPWRIGHT, PIONEER BOATWORKS IN UCLUELET

spend 20 hours at the roller for weeks on end.

Convinced of the design's possibilities, Ecotrust Canada is now actively seeking funding and clients who might be interested in building the 31-foot prototype workboat.

Eric Caswell, shipwright and proprietor of Pioneer Boatworks in Ucluelet, is very impressed with the design detail. "What I really like about Bolger's design is that they are really well laid out and the reasons why they designed things in a certain way are explained," says Caswell. "I'd really like to see one of these boats built." He is now pricing out the cost of building the vessel.

After several years of very little uptake on their sustainable design ideas in their home port of Gloucester, Susanne and Phil are now receiving a lot of interest from the local fishing community, particularly as the cost of fuel has skyrocketed. Suddenly, a vessel which is fuel efficient, easy to build and less costly than conventional designs is getting the attention it deserves.

Needless to say, a lot of water has passed under the *Helen II* since I became interested in the design I first saw in the *National Fisherman*. I still dream of someday being able to replace her with a vessel that has been specifically designed for the hook-and-line integrated groundfish fishery in BC. Phil and Susanne are still looking at ways to customize the design for my own particular needs, such as distinct holds for different species and a hold capacity under the deck of 50,000 pounds, all within the length restriction of 57 feet.

With people like Phil and Susanne grappling with the functional and sustainable design of vessels and Ecotrust Canada willing to fund this valuable research, I feel confident that there is still a future for those of us who want to catch fish for a living.

ONLINE RESOURCES
Profile of Philip C. Bolger / www.hallman.org/bolger
Wikipedia - Phil Bolger / en.wikipedia.org/wiki/Phil_Bolger
Hydrogen-powered vessels / www.shipgaz.com/magazine/issues/2006/18/1806_article.php

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