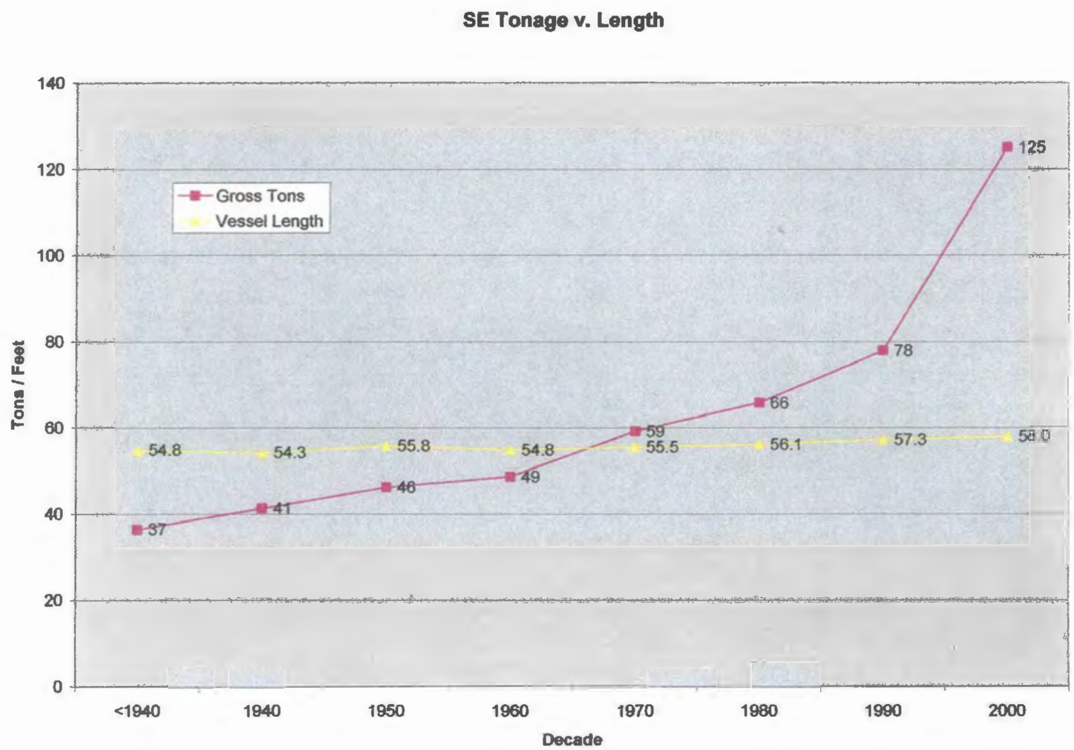
Submitted by Ryan Kapp RC 39

The 58 foot law did not limit fleet capacity.

The original intent of the 58 foot limit was to constrain the capacity of the seine fleet. Many years have passed and it can now be seen that limiting length alone did not ultimately constrict or limit fishery capacity. The salmon seine vessel has been held to 58 feet but the vessels have grown considerably in both width and depth. Today's vessels are being constructed with widths of 25-28ft and depths of 11-13ft. This is a far cry from the vessels of fifty years ago and it must have been unforeseen at the time. The chart below demonstrates the change in seine vessels over time:



The above chart shows average vessel tonnage and length in the decade that vessel was built in. The average tonnage of a vessel built before the 1960's was about 45 tons and the average tonnage of a vessel built in the last decade was 125 tons or approximately 3 times the tonnage of a boat built 50 or more years ago. The design of a 58 foot seine vessel has definitely changed over time because of the length limitation. If the limitation did not exist, or was removed after limited entry, it could be argued that today's salmon seiner would be longer instead of wider using more traditional length to width ratios. The following pages demonstrate the changes of 58 foot seine vessels and also include some vessels over 58 feet for comparison:

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The following vessel comparisons are done using the simplified method for calculating capacity: Length x Width x Depth x .0067 = Vessel Tonnage.

Vessel built: Pre - 1940
58 x 14.5 x 6.4 = 5382
5382 x 0.0067 = 36

36 tons

Vessel Built 1966
58 x 17 x 7.5 = 7395
7395 x 0.0067 = 50

50 tons

Vessel Built 1979
58 x 19 x 9 = 9918
9918 x 0.0067 = 66

66 tons

Vessel Built 1981
58 x 22 x 10.5 = 13398
13398 x 0.0067 = 90

90 tons

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Vessel Built 2008
58 x 25 x 12.5 = 18125
18125 x 0.0067 = 121

121 tons

Vessel Built 1981
65 x 22 x 10.5 = 15015
15015 x 0.0067 = 101

101 tons

Vessel Built 1989
73 x 23 x 9.8 = 16454
16454 x 0.0067 = 110

110 tons

Vessel Built 1976 / 1989
65 x 21.5 x 8.9 = 12438
12438 x 0.0067 = 83

83 tons

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After looking at the previous examples it becomes apparent limiting length alone does not control fleet capacity. Below is a selection from a fishing publication article referring to a recently built 58 foot vessel:

..."We built her as big as we could. **We built an 85-footer that's only 58 feet long**," he says. Still, she's a small boat, and to help dampen the pitching and rolling motion, there's a bulbous bow and rolling chocks.
... It wasn't easy working up the lines for a boat that deep and wide without ending up with something that looks like a shoebox. ..."It was tricky getting a 26-foot beam into a boat and make it look like something."
Working within the constraints of a 58-foot overall length... "you end up standing the bow stem almost vertical," and it's hard to bring the stern in at all...
Not being able to lean the bow out to accommodate a goodly amount of flair or taper in the hull lines leading back to the transom means **you are not going to have as shapely a hull form as you would for a longer boat, a hull that would track much easier through the water. However... "That's the nature of a super wide boat."** (Vessel names and Sources of quotes have been removed. Bold type added for emphasis)

The few 58 foot vessels constructed today now have greater capacities than many vessels longer than 58 feet but are less efficient moving through the water. Is there still a need for a 58 foot limit on salmon seine vessels? Vessels have been allowed to get wider and deeper but not longer. Why? Hull efficiency is an important thing today because fuel prices are soaring and adding width, even with a bulbous bow, is not as efficient as adding length to a vessel. The following are facts of design from the Navy concerning hull efficiencies and length to width ratios:

2.1 Displacement Ships

2.1.1 Hydrostatic Displacement: Ships

2.1.1.1 Historical Origin

It is impossible and unnecessary to present here a history of the development of the displacement hull form. Let it suffice to point out that this hull concept dates to prehistoric times.

2.1.1.2 Dominant Physics

The lift/drag performance of displacement ships at high speeds is dominated by wave making drag. A displacement form moving through the water pushes the water aside as it moves. This disturbance of the water requires energy, specifically propulsive energy from the ship.
Two major parameters affect the wavemaking resistance of the ship: Speed and Slenderness.
Ship wavemaking drag increases rapidly with increasing speed. It is not possible to state a specific law for this increase - a law that holds true for all ships - but it is common to refer to a cubic increase in drag with speed. Specifically, it is commonly understood that ship propulsive power will increase as the cube of ship speed. Thus a doubling of ship speed will require an octupling ($8=2^3$) of installed power.
[1] Transport Factor is a measure of merit developed by Dr. Colen G. Kennell of the David Taylor Model basin. Dr. Kennell's paper "Design Trends in High Speed Transport" was distributed to workshop attendees. Transport Factor is defined as:
TF = 1.6878 / 550 * 2240 * (Full Load Displ. in Long Tons) * (Speed in knots) / (Total Installed SHP)
This cubic relationship is close to true for "normal" speeds. But at very high displacement speeds the curve becomes even more steep. It is common for naval architects to limit their investigation of displacement ships to a speed length ratio of about 1.30. (Speed length ratio is the ratio of ship speed in knots divided by the square root of the ship's length in feet. This is also known as the

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Taylor quotient Tq, after ADM David W. Taylor.) Above a speed-length ratio of 1.3 the increase in drag with increasing speed becomes greater-than-cubic.

Speeds greater than 1.3 are present in some displacement hull designs. The dominant question is "how important is wavemaking?" for the particular design. If one can make the wavemaking problem of lesser importance overall, then one may more readily consider speeds higher than Tq=1.3. The tool (or "one tool") for this is ship slenderness. A slender ship disturbs the water less, and thus has less wavemaking drag. It also has more surface area and thus more frictional drag, but this does not suffer the same steep growth with speed as does the wavemaking drag. Slenderness is measured as the Length over Displacement ratio ($L/\nabla_{1/3}$).

Is the 58 foot limit still important in today's fishery? It forces boats to be modified or constructed in a way which makes them less efficient than allowing boats with more conventional length to width ratios. The inefficiencies of a wider hull design were recognized by the Board in allowing bulbous bows to extend beyond the 58 foot limit to try and gain efficiency. This was a good thing but, under that same premise, why not remove the limit entirely and open up even more options for fishermen to gain efficiencies in their business?

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EVOLUTION OF SEINE VESSEL CONSTRUCTION AND DESIGN

Old Seiner Built 1914

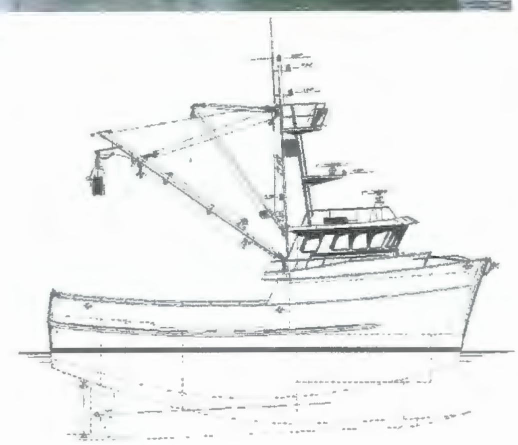
In the early years most seiners were of wooden construction and built to a length of 58 feet because a rule put in place many years ago said they had to be. There were a few longer boats "grandfathered" in but not really that many. As time went on the boats changed.

Seiners built with a "traditional" house.

58 foot boats made of wood that were originally built to be 14 or 15 feet wide in time became 16 or 17 feet wide. Fiberglass and steel construction with widths of 19- 22 feet came next and most recently 24 to 26 feet. All the while there were lots of boats built less than the 58 foot limit.

Seiners smaller than 58 feet

Boat designers began to use a "raised fo'c'sle" design. This increased length to the deck space without sacrificing accommodation space. More recently, as an alternative to the large expense of new construction, vessels that were built at, for example, 18 feet of width are now being widened.



"Raised Fo'c'sle" seiners

Why, after all of this transition and change took place, is a limit on vessel length still necessary? Clearly the limit was never about vessel capacity because nothing kept boats from becoming wider and deeper. The limit on length should have been done away with long ago. When the law was first written did the authors realize what these vessels would morph into?

- The new wide designs are a more inefficient than longer boats which is why most add a bulbous bow. Why not build longer?
- If a "raised fo'c'sle" design was created due to a need for additional deck space. Why not build longer?
- Boats were allowed without limitation to be wider and deeper. Why not build longer?

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The 58' limit on salmon seiners related to length limits in other fisheries.

Many seiners in Southeast Alaska also participate in fisheries other than seining. As a matter of fact, according to CFEC data, around half of the SE seine fleet also participates in other fisheries during the year. The long legacy of the 58 foot limit for salmon seining has influenced regulation in these other fisheries. The state has incorporated 58 and 60 foot vessel length limits into fisheries all around the state such as:

- Sablefish in Prince William Sound
- Cod fisheries in Cook Inlet, Kodiak, Chignik, South Alaska Peninsula, Aleutian Islands, and Bering Sea.
- King and Tanner crab fisheries in the Aleutians, Chignik, and South Peninsula.

There are also 60 foot limits in these federally managed fisheries:

- BSAI Cod fisheries
- Aleutian Islands Pollock.
- C class IFQs
- Gulf of Alaska Pacific Cod fisheries

The fisheries for these species above are not seine fisheries. They are harvested by trawl, pot, jig, or long line. There are vast differences between these harvest methods and seining. These other harvest methods give some advantage to a larger vessel over a smaller one in the actual harvesting of fish.

- **Trawling** involves towing a net on cables directly behind the vessel. The fish are caught in the net when the vessel overtakes them. Larger boats have an advantage as they generally have more horsepower and better sea keeping ability so therefore they can keep fishing in conditions where it is no longer feasible for smaller, less horsepower, vessels to continue fishing because they lack the power to tow the net at the proper speed.
- **Pot** fishing is done by setting traps on the sea floor to catch the fish or shellfish. The fish is harvested by pulling the trap to the vessel and emptying it. Larger vessels have the ability to keep pulling their traps and harvesting in weather that may be too rough for smaller vessels to do the same.
- **Jig** fishing is done by positioning the vessel over fish and putting hooks down in the water to catch the fish. The larger vessel is able to maintain harvesting in worse weather compared to a smaller boat.
- **Long lining** involves setting a line with many baited hooks attached to it which catch the fish. The harvest occurs when the line with the hooks attached to it is drawn aboard the vessel. The large vessel has ability to keep harvesting in rougher weather than the smaller vessel due to better sea keeping ability.

In contrast, **seining** involves manipulating a net between the vessel and its skiff which holds the other end of the net in place. The net is then towed upon to hold its position to trap the fish that swim in between the vessel and skiff. The vessel and skiff then come together so the net encircles the fish, the net is brought in, and the bottom of the net is closed up to prevent the fish from escaping. The

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harvest takes place when the fish in the bunt end of the net are brought aboard the vessel. In this method the harvesting of the fish more depends on the proper functioning of the net rather than the size of the vessel involved. For a seine to be fished effectively it requires more finesse than power. The net harvests the fish, not the boat. Larger boats may be safer in rough seas but they still have the same difficulties operating a seine when weather is not cooperative. Larger boats catch more wind and are harder for a skiff to assist when weather conditions worsen. The larger boat drifts faster which causes the purse line to "fly" greatly reducing the nets ability to catch fish. If anything a bigger boat is more likely to break things like purse lines and cork lines in these conditions than a smaller vessel.

The other difference between these fisheries is in the way they are managed. The salmon seine fishery is managed by forecasting returns based on parent year escapement and other variables. During the season the return is constantly evaluated and the season is opened and closed in various areas based on observed escapements. The fishermen all use the same gear in the same areas for the exact same amount of time. The other fisheries are managed by a quota based on biomass estimates completed for each particular fishery. The fishery is opened and is closed when the allowed quota has been reached for that season. Also, many of these other fisheries take place during times of the year when the weather conditions are not as good as they are during the summer salmon season. Some of these fisheries are on an IFQ system so the fisherman with quota shares can go fishing when it is appropriate to do so.

Because the harvest methods, management, and economies of the other fisheries are vastly different compared to salmon seining it is hard to tell exactly where they fit in as an argument for or against removing the 58 foot limit for seining in Southeast Alaska because whether or not the limit is removed for salmon seining the other fisheries will remain unchanged. Additionally, many of the fisheries mentioned above are not done by fishermen who seine in Southeast. The fisheries with the most participation by those who also seine in Southeast are long lining for halibut and sablefish.

Alaska's sablefish and halibut fisheries

An outgrowth of the 58 foot restriction is the federal 35, 60, and 125 foot categories which National Marine Fisheries Service used to determine when observers needed to be aboard vessels and to prevent a full scale reorganization of the fleet which might have resulted from rationalizing the sablefish and halibut fisheries. The 58 foot limit influenced this and thus a 60 and 125 foot limit was used for regulation of observer coverage. But observer coverage is changing to include vessels under 60 feet. Electronic observer coverage may come into play as well. Once observer coverage is expanded the 60ft regulation may no longer be necessary because every fisherman has personal quota so the size of the vessel the fisherman catches it on should not matter.