HOW DO DOCKS AND FLOATS IMPACT SALMON?

Let's make up a back-of-the-envelope model using some rough approximations.

Kitsap County, excluding Bainbridge, has 216 miles of shoreline

216 x 5280 feet in a mile = 1,140,480 linear feet of shoreline

Assume nearshore habitat extends out an average of 100 feet so. Thus, total nearshore habitat is 114,048,000 sq. feet in area.

Assume an average dock is 8 feet wide and 50 feet long = 400 sq. feet in area.

Assume there is, on average, one recreational dock (it's not fair to count things like ferry terminal docks or yacht basin docks because they can't be removed) every quarter mile; so 4 x 216 = 864 recreational docks that are actually regulated under the law being considered. 864 docks x 400 sq. feet/dock = 345,600 sq. feet of dock over 114,048,000 sq. feet of habitat. So divide 345,600 by 114,048,000 and you get the result that docks cover .003 of the habitat – in other words, a little over 1 quarter of one percent or 3 parts in 1000.

This actually overstates the amount of light blocked by docks because ambient light does enter the water under the dock. It's certainly not the case that it's pitch black under a small recreational dock. It's also the case that a substantial portion of the dock is generally so near the shore or even over the shore that it can't affect the nearshore environment. However, we will mention these facts but ignore them in the model.

It's not reasonable to assert that this .003 fraction reflects an effect that kills 3 salmon in 1000. What's reasonable would be to assume that whatever the possible negative effect of dock shade on salmon health might be, it would be a very small factor compared to quality of spawning streams, ocean conditions, predators such as seals, etc. So let's assume that dock shade does actually harm salmon in some minor way. A reasonable guess as to the impact of this harm would be that it is, at most, a one percent factor in the health of the average salmon. So we can multiply our .003 fraction by .01 to get that the total possible serious harm to the health of the average salmon caused by dock shade is .00003 or 3 parts in 100,000.

So let's think about this in a real-life situation. A lot of salmon return to Chico creek each year but the actual count is not known. Let's say the number is 30,000. Given our model, we can reasonably calculate the total harm of all the recreational docks in Kitsap county on the annual Chico creek salmon run as .00003 x 30,000 = .99. In other words, a little less than one salmon a year. So, if we were to remove all the recreational docks in Kitsap county we could reasonably expect the annual salmon run in Chico creek to increase from 30,000 fish to 30,001 fish. How much money would this fish cost the citizens of Kitsap county each year?

People might disagree with the assumptions in this model but even fairly drastic revisions in the model don't make much difference in the final outcome. Let's say there are 5 times as many docks as originally assumed – so 20/mile on average. Then removing this much larger number of docks would result in 30,005 salmon in Chico creek. Let's say we keep the same number of docks but assume they are twice as large - so the effect is .006 instead of .003 – then we have 2 more salmon/year.

There is no science that readily comes to mind that would invalidate this model.

This admittedly quick-and-dirty model agrees with the observation that each year 30,000 or so salmon swim by some of the most highly developed real estate in Kitsap county -- real estate in Dye's Inlet with lots of small recreational docks -- and the fish don't appear to be affected at all.

You can do the same sort of math for the harm done by pilings or the possible harm of chains on floats – except that the harm is much smaller because the surface area affected is smaller. If you assume, for example, that there are 5 pilings per dock and each piling disturbs 2 square feet of environment, you can do this division (10 sq. feet x 864 docks/114,048,000 sq. feet of habitat) = an effect of .000076 or about 8 parts in a million. If you assume that this has a 1% harmful effect on the average salmon you could save 8 salmon out of each 100,000,000 by removing all the pilings – or one salmon in each 12.5 million.

At that rate, you would add one salmon to the Chico creek run each 417 years. Of course, the right way to do this model would be to add the harm done by pilings to that done by docks, since we are assuming that docks and pilings come together. However, if the harm caused by pilings is due to direct physical disturbance, which is how it is described in the Battelle research, then it's very hard to come up with any model that would argue that pilings have an important effect on the nearshore.

Prepared by the Kitsap Alliance of Property Owners
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