

## Understanding extreme shifts in shellfish populations of the Prince William Sound

A historical perspective by Jon Van Hyning

This paper will deal with the spot shrimp population in specific, even though it is intended to be adapted to many other shellfish populations of other locations.

The spot shrimp population drop in the later 80s and early 90s must be attributed to poor recruitment. Reduced shrimp numbers that have even a mediocre recruitment will begin to rebound after a few years. All other contributing factors are negligible compared to a major deficiency in recruitment.

During the latter 80s, it was observed that icebergs in the Port Wells area were no longer following the routes down the bay that they had taken for hundreds of years. The routes that they had long taken were mapped out by the boulders that had dropped out of the icebergs. Nothing of this magnitude happens specific to an area. Currents in the entire Sound were changing.

To understand how this could affect shellfish recruitment so dramatically, we must first understand how water flow helps or hinders good recruitment of shellfish. I find it easiest to conceptualize an ideal current for best recruitment by comparing it to a gold miner's sluice box. The riffles in a sluice box create a low turbulence area on their downstream side where heavier items such as gold drop out.

As a current follows a shore line, angled land masses and bays serve as riffles for the shellfish larva. The ones that have increased shell weigh like the gold, then drop from the water column into these low turbulent places that are often associated with estuaries.

Ideal for increasing their odds of survival to adulthood, as with a sluice box: if the current becomes erratic for an extended period (basically sloshing back and forth) you don't get less gold, you get no gold. This flushing effect has over ridden the encircling of the water back on to itself that happens behind the riffles.

To understand how this could happen to a water body as large as the Prince William Sound, we need to go to Hinchinbrook entrance and see how traditional and non-traditional gulf currents can affect pressures and flows in the entrance.

As most mariners understand the primary Gulf current arches around the North Gulf coast in east to west direction. What is not well understood is the water pressures just south of this arching flow. During times of shellfish abundance the pressures from

these more southern currents are relatively light. The water moving past the Hinchinbrook entrance has created a vacuum effect and is pulling water into the Gulf. Cape Hinchinbrook has created a pronounced riffle, that first pulls planktonic shellfish away from shore and then curls them around and deposits them, hopefully near an estuary area.

The pulsing of southern pressures can still be felt during these time of plenty but are working to the advantage of the shellfish. The pulsing pressures exaggerate the riffle effect into a sort of shellfish larva pump.

During times of low shellfish abundance either the arching Gulf current has weakened or the more southern pressures have strengthened. As these southern pulsing pressures moved north the pumping riffle effect became erratic. Prior to the Hinchinbrook vacuum effect beginning a stop and go cycle that lasted over 12 years until it shut down completely the vacuum effect in the latter 90s.

Effects of this were observed as it related to a strong river-like current flow that comes out of Columbia Glacier and the Valdez Arm at a depth of over 200 fathoms. Traditionally this current flow heads directly south for the entrance that has an active vacuum effect pulling from the Sound. During the 12-year transition period, Hinchinbrook entrance became an on and off switch. This current began to head west between Glacier and Story Island in the same on and off sporadic fashion happening at Hinchinbrook entrance. This then exposes the driving forces behind the flushing phenomenon that crippled the spot shrimp recruitment. This deep water current now flows steadily west between Glacier and Story Island feeding the spot shrimp recovery. These new, consistent currents are not the same as the currents of old. They are travelling at different angles and velocity, meaning all new upstream populations will need to be established before shrimp populations downstream will receive proper recruitment.

This could very well explain the slower population development in the southern portion of the Sound. Keep in mind reduced fishing for this area will have no effect on increased recruitment as those shrimp originate elsewhere.

I prefer the reader to reach their own conclusions. Mine would be, the spot shrimp populations of the Sound would be very similar to today, if no shrimp pots had ever been set.

RC 36

**WHO IS LIKELY TO SUFFER?** No one.

**OTHER SOLUTIONS CONSIDERED?**

**PROPOSED BY:** Whittier Advisory Committee

(SC-05-F-006)

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**PROPOSAL 314 - 5 AAC 55.022(b)(5). General provisions for seasons, bag, possession, and size limits, and methods and means for the Prince William Sound Area; 5 AAC 02.210(5). Subsistence shrimp fishery; and 5 AAC 77.553(2). Personal use shrimp fishery.** Amend these regulations as follows:

Repeal the requirement for a shrimp harvest record for sport, personal use and subsistence users fishing for shrimp in Prince William Sound.

5 AAC 55.022(b)(5) shrimp: may be taken from April 15-September 15; no bag, possession or size limits; [A HARVEST RECORDING FORM IS REQUIRED AS SPECIFIED IN 5AAC 75.016]; no more than five pots per person, with no more than five pots per vessel may be used to take shrimp; all shrimp pots must have at least two adjacent vertical sides, or near-vertical sides, excluding tunnels, completely composed of uncovered net webbing or rigid mesh; pots that do not have a definable side, including round pots, must have net webbing or rigid mesh panels covering a minimum of 50 percent of the vertical, or near vertical , surface of the pot; the net webbing or rigid mesh on all pots must be large enough to allow the passage of a maximum 12-inch long, seven-eighths inch diameter, round wooden peg without deforming the opening , except for the selvage;

5 AAC 02.210(5) a person may only take shrimp from April 15 – September 15 [UNDER THE AUTHORITY OF A SUBSISTENCE FISHING PERMIT ISSUED BY THE DEPARTMENT UNDER 5 AAC 02.015];

5 AAC 77.553(2) REPEALED

**ISSUE:** Beginning January 1, 2001 a shrimp harvest record was required for sport, personal use and subsistence users fishing for shrimp in Prince William Sound. The harvest record requires anglers to report date and areas fished, number of pots and time fished, and harvest. This information is collected to estimate effort and harvest of shrimp by non-commercial users throughout Prince William Sound (PWS). In addition to the permit requirement, new shrimp regulations approved by the Board of Fisheries at the 2000 meeting included a reduction in the number of pots to no more than 5 per person, with a maximum of 5 pots per vessel; and the establishment of a shrimp season from April 15-Sept. 15. After collecting three years of permit data from the PWS shrimp fishery, the harvest trends appear to correspond to data as reported in the department's *State Wide Harvest Survey* (SWHS). By the time the PWS shellfish board meeting is held in 2005-2006, the department will have collected four years of data that can be compared to SWHS estimates. The department will be able to make a recommendation to the board if continuation of the harvest reporting form regulations are necessary, or if the data needed to manage and monitor the shrimp fishery can be collected from the SWHS estimates and the harvest form regulations can be repealed.

**WHAT WILL HAPPEN IF NOTHING IS DONE?** A harvest record will continue to be required along with its cost to the department.

SUBMITTED BY DIANNE DAVIS 229  
PROPOSALS FROM THE 2006 STATEWIDE SHELLFISH MEETING

**WILL THE QUALITY OF THE RESOURCE HARVESTED OR PRODUCTS PRODUCED BE IMPROVED?** No.

**WHO IS LIKELY TO BENEFIT?** The department and anglers fishing for shrimp in PWS.

**WHO IS LIKELY TO SUFFER?** Nobody

**OTHER SOLUTIONS CONSIDERED?** Continue collecting data with the permit

**PROPOSED BY:** Alaska Department of Fish and Game (HQ-05-F-245)

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**PROPOSAL NO. 314**

**ACTION: Carried**

**DESCRIPTION:** Repeal the requirement for sport, subsistence, and personal use shrimp permits.

**DISCUSSION:** The board compared data collected from harvest records and the Statewide Harvest Survey. This would change how the information is collected and does not weaken the ability of law enforcement to enforce shrimp pot regulations.

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**PROPOSAL 323 - 5 AAC 58.022(a)(12-13). Waters; seasons; bag, possession, and size limits; and special provisions for Cook Inlet – Resurrection Bay Saltwater Area; 5 AAC 58.026(b). Shellfish harvest recording form required; and 5 AAC 77.508(a), (b)(1). Personal use permit for shellfish.** Amend these regulations as follows:

Repeal the requirement for a shellfish harvest record to take hardshell clams in Kachemak Bay. For the purposes of this proposal “hardshell clams” means Pacific littleneck clams (*Protothaca staminea*) and butter clams (*Saxidomus giganteus*).

**ISSUE:** The harvest record requirement was to provide effort and harvest by location within Kachemak Bay and species composition of the harvest but compliance in reporting on the permit was found to be poor and estimates of harvest composition and location from the permits biased.

**WHAT WILL HAPPEN IF NOTHING IS DONE?** A permit requirement for digging hardshell clams in Kachemak Bay that produces biased fishery data will remain in place.

**WILL THE QUALITY OF THE RESOURCE HARVESTED OR PRODUCTS PRODUCED BE IMPROVED?**

**WHO IS LIKELY TO BENEFIT?** The public and the department will benefit from funds being expended on other programs that better assess clam effort and harvest in Kachemak Bay.

**WHO IS LIKELY TO SUFFER?** No one.

**OTHER SOLUTIONS CONSIDERED?** Increased enforcement of the permit program may improve compliance.

**PROPOSED BY:** Alaska Department of Fish and Game (HQ-05-F-242)  
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**PROPOSAL NO. 323**

**ACTION: Carried**

**DESCRIPTION:** Repeal requirement for sport, subsistence, and personal use hardshell clam permits.

**DISCUSSION:** The board considered this a housekeeping proposal. Permit data was considered unreliable due to noncompliance of reporting. The department is using other survey methods to determine harvest effort by location. There is a significant cost to the department to administer this permit.

RC37













Submitted by: Alaska Department of Fish and Game at the request of board member Kluberton.

Date March 21, 2012

PROPOSAL 350

5 AAC 38.076 ALASKA SCALLOP FISHERY MANAGEMENT PLAN

(d) A vessel may be registered to take scallops in only one scallop registration area at a time[.] except that the department may permit a vessel to register for one additional registration area as follows:

1) Prior to entering or leaving a scallop registration area for which the vessel is validly registered, the vessel permit holder must contact the department office responsible for management of the registration area as specified in (l) or as specified on the area registration.

2) A "certified" scallop observer, as defined in 5 AAC 39.143 must be on board the vessel. The certified observer must have been briefed by the department prior to leaving port for both the registered area and the additional registration area the vessel intends to fish.

3) Prior to checking out of, or in to, a registration area the scallop observer must verify the total pounds of processed or unprocessed scallops on board the vessel; a vessel changing registration areas may not have any unprocessed scallops on board.

4) In addition to (p) of this subsection, a CFEC permit holder will ensure that all harvest from a registration area is reported on an ADF&G fish ticket prior to checking out of a registration area and will provide, prior to leaving the registration area, the fish ticket number and harvest reported on each ticket to the department office responsible for management of the registration area.

March 21, 2012

Alaska Dept. of Fish and Game  
Boards Support Section  
PO Box 115526  
Juneau, AK 99811

RC 39

RE: Misc. Business

Dear Karl Johnstone, Chair and Board of Fish Members,

I would like to request that for the 2014/2015 Board Cycle that you reorganize the schedule. I would request that the December and January meetings consider the Southeast proposals and the February meeting consider the Prince William Sound proposals. I am asking for this change in schedule as many of the fishermen who participate in the crab fisheries in Southeast during the timing of the February Board of Fish meeting also participate in the finfish fisheries of Southeast Alaska. Under the current schedule fishermen have to choose between participating in the process with the associated loss of income or participating in their livelihood/fishery.

I am aware that this change in schedule should not be taken lightly so am requesting that the Board accept this idea for further consideration at the October 2012 work-session. By publicly noticing this item on the agenda for consideration, this allows Alaska Dept. of Fish and Game, Advisory committees and the public a chance to consider and comment on the possible benefits or drawbacks to such a change to inform the Board before a final decision is made.

Thank you for your consideration.

Sincerely,

*Mitch Eide (email signature)*

Mitch Eide