DRAFT MANAGEMENT AND DEVELOPMENT PLAN:

Sardines in BC

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This is final paper of a series of occasional papers outlining some issues in the development of the sardine fisheries of BC. Readers can provide comment and feedback to: dapepper@shaw.ca

All comments will be acknowledged and may be incorporated into the final draft of a paper from the Pacific Sardine Association entitled:

"A Management and Development Plan For the Sardine Fisheries of BC".

This paper is provided for discussion purposes only.
The views expressed herein are those of the author only
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1. INTRODUCTION

This is a draft plan that puts forward some recommendations for development and management of the sardine fishery of BC. As such it is lacking in input from many of the possible stakeholders in the fishery and may suffer from invalid assumptions. However, its purpose is to stimulate discussions among the stakeholders and allow the development of a plan for the fishery that will, ultimately, be defined by DFO.

This paper is being made available to stakeholders and comment is welcomed. It is available on the Pacific Sardine Association (PSA) website at: www.bcsardines.ca/.

This paper surveys the present situation and recognizes that the situation is dynamic, influenced by changes in the environment and biomass, in economic conditions, and in government policy. Predicting the future is hazardous at best, but done properly, the development of the sardine fishery in BC has the potential to provide many benefits to fishermen, processors and coastal communities.

2. THE RESOURCE

After an absence of about fifty years sardines have returned to BC waters. They are unusual in that they are transients, coming up the California Current in early summer to feed off Vancouver Island and then to return in late fall to spawn in warm waters off California. The previous fishery, 1924-1944, was primarily for fishmeal and the collapse of the stock, for mainly environmental factors, saw the fishery terminate. (See data in Appendix 4).

The biomass has recovered to about 1.1 million tons. Baumgartner has analyzed core samples of sardine scales and traced the rise and fall of sardine populations over two millennia. His analysis shows that the stock rises and falls in almost predictable cycles. The rule of thumb appears to be that sardines will increase for a period between 20 and 60 years, with an average of 40 years and then show the same type of behavior in decline. His analysis shows that the stocks have peaked at over four million tons. The current stock is currently estimated at 1.1 million tons. The US agencies have declared that the sardines stock has recovered and allowed a fishery to take place.

The crucial factor for BC is the amount of the stock that comes to BC waters. Historically, BC caught about ten per cent of the US catch. Ware(1999) has estimated that this is a valid estimate of the amount of fish coming to BC. Some years it will be higher, others lower, related to water temperatures off Vancouver Island. Warm water, such as an El Nino year, will bring large amounts of sardines to BC and cold years will inhibit their travel.

With the current stock at about 1.1 million tons the US has set the total-allowable-catch (TAC) in 2001 at 118,000 tons. PSARC has set the BC ceiling at about 18,000 tons for 2002. However, DFO has not set the targets for the fishery. It is expected to be less than the 18,000 tons. However, the biological elements still remain: in some years large amounts of sardines will come to BC, other years not. For this reason the review and prediction of water temperatures is a defining factor for a BC sardine fishery.

Issue*: How many sardines are in BC waters in a particular ye*ar?

Recommendation: ***Detailed sampling and monitoring of sardines should be done over an extended period to provide hard data to facilitate annual predictions of sardines in BC***.

3. THE MARKETS

The market for BC sardines is still emerging. Currently, the world market is defined into four segments:

- fishmeal
- feed for tuna farms
- bait for high seas tuna longliners
- food.

Each of these markets has a price and unique economic conditions. BC cannot compete in the fishmeal market because of government regulations against its production and in the feed for tuna farms market because of the low prices available. The market for tuna-bait has been estimated at 40,000 tons but is influenced by the demand for tuna and the availability of substitute species such as saury or mackerel. The food, market is primarily in Japan and this has some rather special factors.

The bait market is in a sense a commodity market as there are extensive substitutes and a large supply available. The Washington and Oregon producers have increased their production to around 20,000 tons and it is expected that they will begin to dominate this market an establish prices. BC producers can sell into this market and hope for a premium based upon higher quality butt this is not expected to be a large advantage. BC producers will be "price-takers". The price will be determined by US production.

The food market is small and currently concentrated in Japan. The Japanese stocks of sardines are in decline and the availability of fresh sardines has decreased substantially. The consumption of frozen sardines is a new phenomenon and requires development. The prices received are good but quality is a feature of this market. Japanese consumers appear to require large fish with a high fat content and high quality. Development of this market has potential for BC producers.

Issue: ***An increase of BC production requires markets. The various niches have different price structures but the food market is where BC has a competitive advantage, market penetration is needed.***

Recommendation: ***Penetration of the bait and food market will depend upon quality. BC producers should focus upon a quality product and development of the food market.***

4. THE INDUSTRY

The BC processing industry has undergone extensive re-structuring and consolidation. Reduced throughput in all species is a fundamental problem. The fishing sector has been similarly affected but the license buy-back has shrunk the fleet. Nonetheless, the fishing sector is in need of more revenues. In addition, one of its major markets, Japan, is in recession and the depreciation of the Yen means BC producers receive less for their various products.

The key economic feature of an expansion of the sardine fishery is the excess capacity in the fishing and processing sector. This means the existing infrastructure can process sardines without any additional capital costs in vessels and plants. Over-capitalization is a traditional bug-a-boo in fisheries but a reasonable guess is that there will be no need for increased capital expenditure to accommodate increased sardine production. The experience of the industry in herring roe fishery allows an almost seamless adaptation to a sardine fishery.

Issue: ***The excess fishing and processing capacity in the industry provides for an expanded sardine fishery without increased capital expenditure. The decline of the Yen will put pressure on the industry to lower costs.***

Recommendation: ***New entrants can expect high costs associated with learning how to fish and process sardines for the various markets. They should be aware of "start-up" costs and adjust their margins accordingly.***

5. CURRENT ISSUES: PSARC, DFO, NATIVE TREATIES, COASTAL COMMUNITIES

There a wide range of issues connected with an expansion of the sardine fishery. We can examine some in more detail and derive a possible useful recommendation.

a) PSARC. This body sets the TACs annually. However, the US "model" (technically, a formula) which estimates the biomass is in need of revision. This has started in a "think-tank" forum in the US. Similarly, PSARC has just developed its own model to estimate the amount of sardines in BC. This model will need refinement as more data becomes available.

b) DFO. The department has undergone a certain amount of bureaucratic trauma perhaps culminating in the Report of the Institute for Dispute Resolution noting that DFO needs to change, especially in its method of consultation. To its credit, DFO has recognized the problem and proposed some solutions. The development of the sardine fishery will be one test of its resolve to do things differently (and perhaps correctly).

c) NATIVE TREATIES. There is only one major treaty (the Nishga treaty) signed in BC and while there are treaty negotiations on other native claims they appeared to stalled. Thus, the role of natives in the fisheries and their claims to it are uncertain. DFO has attempted to "grasp the nettle" of Native claims in the fisheries and has derived an Aboriginal Fisheries Strategy (ABS). In effect, DFO gives fish resources to Natives when it perceives some sort of reasonable claim to them. It is expected than an expansion of the sardine fishery will result in permits to Natives, either to individuals, Bands or communities. Without discussing the merits of the ABS policy it has been highly controversial in the industry. In the case of sardines, it appears to be within the Minister of Fisheries prerogative to issue permits as he desires. This authority will allow the Minister to determine the composition and size of the fishing fleet.

d) COASTAL COMMUNITIES. Coastal communities, which are dependent upon natural resources, are suffering. Sardines offer the potential for some relief in the increase of fishing and processing jobs from an expanded sardine fishery

Issue: ***The complexity of the issues surrounding the sardine fishery make it necessary to approach expansion in an integrated manner to reconcile the various problems and issues.***

Recommendation ***: DFO and the stakeholders should develop and extensive consultation and discussion process to develop a comprehensive management plan. This plan would have certain measurable objectives and satisfy the criteria of transparency and fairness.***

6. LICENSING AND EXPANSION OBJECTIVES

The crux of fisheries management centers on licensing. There are a variety of regimes that essentially give some form of "property right" to a common property resource. The type of regime selected depends upon a number of factors. The two classic criteria are that it is 1) politically acceptable and 2) administratively feasible. However, the result can be a slapdash system that results in inequities and continual wrangling. DFO has formed a License Appeal Board to deal with imperfections in the various systems of licensing and regulation. What is needed in the sardine fishery is a method of selection of permits that is seen to be "fair and transparent". Unfortunately, these are subjective values. One man's "fairness" is another man's grievance.

Licensing, or the allocation of permits, should have a larger purpose beyond the ordinary objectives of politics and administrative acceptability. However, there are also other constraints in the process, such as the ABS policy of DFO which mandates permits to Natives and the Emerging Fisheries Policy which mandates priority to those who were early participants in the fishery. But even with all these constraints, licensing should accomplish larger objectives, such as the maximization of benefits to the economy of BC.

DFO may also have its own objectives, such as assisting the salmon seine fleet, and may impose these "hidden" objectives upon the ultimate design of a licensing regime which includes selection and performance criteria. Certainly included will be aspects of cost-recovery and Observer programs. Nonetheless, the need is for selection criteria that are "fair and transparent" which must answer to some worthwhile objectives focused on the long term. The selection of applicants for permits and the design of the licensing regime should be done with great care. That task is made easier if there is a comprehensive plan with measurable objectives in the sardine fishery.

Issue: ***selection of applicants for permits and the design of the licensing regime has a number of constraints but a comprehensive management plan would assist in satisfying the criteria of a "fair and transparent" process. The criteria of "politically acceptable" and "administratively feasible" as elements of licensing can be satisfied with a comprehensive plan with clear objectives.***

Recommendation*: A precursor to the selection of permit -holders and the design of a licensing regime is recognition of the need for a comprehensive long term development plan.*

7. MANAGEMENT AND DEVELOPMENT ISSUES

The management of a fishery is a complex undertaking. While it possible to take courses in napkin-folding and other endeavors it is not possible to take a course in fisheries management. It is a skill learned "on the job". As such it suffers from a myriad of inconsistencies and inefficiencies. Fisheries management systems (setting of catches limits, licensing etc.) have evolved over time with the hammer of the industry striking the anvil of DFO. The fundamental problem is that there has never been a consensus on what the fisheries are for. That is, what are the objectives of the fishery in the short and long term?

Fisheries have been seen as a means of economic development at various times with variable results. They can achieve certain social and economic objectives. The rationale is that the largest benefit to society can be achieved by allocating fishing rights to those who have the lowest opportunity cost. That is, those with little or no opportunities for alternate employment. In short, they come off the welfare rolls and make a contribution to GDP. The benefits (in the form of licenses) may have gone to others but the increased benefits are not as great.

Fisheries in BC have never been seen as a development vehicle. But the plight of the coastal communities dependent upon natural resources is well known. The sardine fishery presents a small opportunity to be used as a regional economic development tool. In what form it may take is uncertain but the opportunity is there.

Issue***: Fisheries have been used with occasional success as a economic development tool. The BC coastal communities could profit from sardine fishing and processing focused in their areas.***

Recommendation***: the management plan for sardines should consider the impact of allocating permits on coastal communities or their residents.***

8. CONCLUSIONS AND RECOMMENDATIONS

The foregoing analysis has presented some specific issues and recommendations for an expanded sardine fishery. It is obvious that an expanded sardine fishery will require extensive consultations among the stakeholders for a management regime that is acceptable to all. From a review of these issues discussed previously we can state a general issue and an overall recommendation:

Issue*: There is no long-term management plan for an expanded sardine fishery.*

Recommendation*: Stakeholders in the sardine fishery should design a management plan that has measurable objectives subject to an annual review. The principle of accountability should be incorporated.*

The previous issues and recommendations are also included here:

Issue 1*: How many sardines are in BC waters in a particular ye*ar?

Recommendation: ***Detailed sampling and monitoring of sardines should be done over an extended period to provide hard data to facilitate annual predictions of sardines in BC***.

Issue 2: ***An increase of BC production requires markets. The various niches have different price structures but the food market is where BC has a competitive advantage, market penetration is needed.***

Recommendation: ***Penetration of the bait and food market will depend upon quality. BC producers should focus upon a quality product and development of the food market.***

Issue 3: *The excess fishing and processing capacity in the industry provides for an expanded sardine fishery without increased capital expenditure. The decline of the Yen will put pressure on the industry to lower costs.*

Recommendation: ***New entrants can expect high costs associated with learning how to fish and process sardines for the various markets. They should be aware of "start-up" costs and adjust their margins accordingly.***

Issue 4: ***The complexity of the issues surrounding the sardine fishery make it necessary to approach expansion in an integrated manner to reconcile the various problems and issues.***

Recommendation ***: DFO and the stakeholders should develop and extensive consultation and discussion process to develop a comprehensive management plan. This plan would have certain measurable objectives and satisfy the criteria of transparency and fairness.***

Appendices

Appendix One

Schedule of stakeholder consultations with DFO.

Sardines traditionally appear in BC waters with the advent of 12-degree C water in mid-July. This year (2002) they are expected earlier because of a potential warming trend from a possible mild El Nino. A IFMP will have to be in place for fishing and processing to commence. This date determines a schedule of stakeholder consultations. The industry will be focusing upon the herring roe fishery in March and many stakeholders will not be available for consultations. A possible timetable is as follows:

January 15- DFO announces consultations under Emerging Fisheries and IFMP policies.

February 4- Consultations commence with major industry participants including Native organizations

February 28 - First round complete.

March 31 - Results of First Round published

March 15 - Second Round of consultations start - Public and coastal communities

April 15 - Final Round starts

May 15 Draft Management Plan released to industry

May 31 - final comments from stakeholders on Draft Plan

June 1 IFMP released.

Appendix two
Integrated Fisheries Management Plan

These are available at:

Appendix three

Summary recommendation of the Institute for Dispute Resolution and DFO "Backgrounder" on DFO Consultations Process.

Th report is available as a pdf file at:
http://www-comm.pac.dfo-mpo.gc.ca/english/consult/decision.htm

The "Backgrounder" is available at DFO as "Backgrounder"
(BG-PR-00-19e, June 8, 2000)

Appendix four
Data

Here are some selected data on sardines.

The US model estimating the biomass:

PACIFIC SARDINES: Stock Biomass and Recruitment

Biomass= >age1	(in metric tons)	CI=Confidence Interval	
	(in ,000)	95%	
Recruitment=age 0			

		STOCK BIOMASS	(MT)	
YEAR	Area1	Total Area	Lower CI	Upper CI
83	5,056	5,056	2,957	10,099
84	12,816	12,878	9,063	21,181
85	20,961	21,439	15,573	33,385
86	29,917	31,484	24,446	44,926
87	72,083	75,573	59,772	108,304
88	105,088	114,408	94,477	152,212
89	160,457	178,912	148,464	239,814
90	175,762	208,108	173,068	282,917
91	222,968	258,856	198,733	394,671
92	331,202	416,435	308,879	643,578
93	482,639	438,385	336,054	655,658
94	511,541	635,350	511,046	912,435
95	537,008	720,733	580,872	1,013,478
96	483,698	789,746	654,219	1,076,120
97	435,700	765,450	644,562	1,032,142
98	693,865	738,098	601,127	1,030,048
99	693,865	1,084,814	818,716	1,654,253
2000	718,662	1,182,465	934,879	1,896,204
2001				

US Model for TAC

BIOMASS	CUTOFF	FRACTION(%)	US DIST	HARVEST GUIDELINE (mt)
1,182,465	150,000	15%	87%	**134,737**

	RECRUITMENT	(numbers)
Total Area	Lower CI	Upper CI
141,403	88,847	246,958
226,169	147,229	371,294
219,856	155,365	352,332
846,294	615,775	1,287,227
832,040	617,653	1,190,540
1,461,068	1,063,523	2,219,947
1,158,867	810,564	1,894,887
4,709,570	3,090,489	8,018,753
5,902,130	3,685,261	10,226,905
4,105,231	2,593,962	7,299,626
8,927,805	6,324,826	14,328,381
10,906,645	7,633,095	16,934,560
6,785,885	4,781,041	10,792,603
5,565,890	3,820,403	9,088,025
8,135,807	5,105,778	13,574,897
19,021,736	12,389,294	3,311,696
11,581,850	6,558,572	22,728,400
13,584,794	6,940,772	28,942,209

METRIC TONNE = 2206.4 POUNDS