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RC 372 WATER PROTECTORS

Herring Synthesis, by Tom Thornton et al., 2010, describes a variety of adaptive management techniques developed by Tlingit culture over the course of millennia. What follows is an excerpt from *Herring Synthesis*.

dried in sun or just in the air. When the roe is dry, they remove it from the wicker and keep it to use. ... In addition to fish, raspberries are preserved and eaten with herring roe, thus making a *tolkuska*. (Klebnikov 1976, orig. 1861, quoted in Schroeder and Kookesh 1990:5).

We learned nothing of the wicker basket method of harvest. Perhaps there were other local technologies developed to harvest herring which have not been documented.

Local and Traditional Knowledge and Adaptive Management

The variety of techniques Natives developed to harvest herring and their year-round use of the species suggests that it was a staple resource, rather than a luxury, and also focal point of cultural development. Along with salmon, it has been said that “Herring are the ‘staff of life’ for them” (Salisbury 1962:155). Critical fishing technologies, knowledge, and skills were built up through interactions with herring and efforts to enhance supply and regulate demand at various scales suitable to the particular locality. This knowledge, innovation, and social learning (Berkes 2008) allowed Native peoples of Southeast Alaska to harvest herring sustainably from pre-contact times to the present. This process of “strategic learning-by-doing or quasi experimental approach to the management of natural resources encouraged by institutional flexibility” is termed by Armitage et al. (2007:328) as *adaptive management*.

It should be noted that just as humans have adapted to herring populations, so have herring adapted to human populations, and not merely through avoidance. This is discussed more fully in the Life Cycle section, but a single example may be introduced here. Herring have long been associated with fish processing and storage facilities, where fish waste is discharged. If conditions are not otherwise unsuitable, herring will move into these areas to feed on fish remains discarded by processors. However, as

regulations on waste have tightened, and facilities have become less productive, the patches of herring associated with the gurry discharge have correspondingly dispersed (see Management Chapter for specific comments). As schooling fish, herring seem to possess a “swarm intelligence” that governs their movements and patterns of behavior in unique and powerful ways. But few investigations have been carried out to see how certain mass responses may be related to human and environmental factors.

Native and non-Native fishermen alike have had to do the best they can to understand, cultivate, and manage herring resources in their seasonal, patchy abundance through various techniques of capture, storage, distribution, and consumption. Although not all these techniques are strictly concerned with conservation of herring, they were designed either to help sustain the species or to make the most efficient use of it, which in turn, insured a sustainable supply.

Today, many production techniques, such as rendering herring oil and the air drying of eggs, have all but disappeared from local culture due to modern conveniences like freezers, or the availability of alternative products, such as seal oil or commercial cooking oil. While Natives appreciate the modern technology and conveniences, some have mixed feelings about the loss of traditional skills involved in herring egg production:

The ones that were dried, it was amazing how they were dried and all you had to do was soak them and then boil them, and they were almost the same as when they were fresh. Hardly anybody does that anymore because everybody has freezers. And if you have freezers, you have a freezer you don't need to dry it. But I think someone should do it anyway just so we can keep that knowledge that this is how it's always been. (Fred Hope)

Similarly, Native communities have lost managerial control of the herring fisheries, for which they had evolved a wide range of tools to conserve herring populations for sustainable use. Despite recent “co-management” developments, such as the Memorandum of Agreement between Sitka Tribe of Alaska and the State of Alaska (2002) and various participatory avenues for input to fisheries management, Natives collectively have very little effective control over the fate of herring. What is more, it is assumed that there was no effective system of controls in the past based on traditional resource management techniques, which is not the case.

Table 2.1 summarizes the key traditional resource management strategies exhibited by Southeast Alaska Natives in terms of supply and demand techniques, with examples drawn from the analysis above. Techniques to manage supply include technologies of preservation and storage, trade and exchange, habitat conservation, habitat cultivation, return of selected egg deposits, transplantation, and efficiency innovations. On the demand side, key techniques include territoriality, mobility, prescriptions and prohibitions, prey choice, substrate choice, and sabotage or sanction of high-demand harvesters or hoarders.²

It may be that most of these techniques went unrecognized because they were conducted quietly in a non-confrontational way. For example, The Watchman figure,

² Of course most non-Native observers failed to recognize Tlingit resource management strategies and some feared that their efficient harvesting tactics might jeopardize the resource. In the case of herring an isolated example of this perspective is that of Evermann's (1913), an early and ardent advocate for fisheries conservation, who observed, “In this connection, citation is made of the doubtful practice of the Indians at Auk Bay and other places of putting brush in the water each spring during the spawning season for the purpose of securing herring eggs which they dry and make use of as a food delicacy. The adhesive tendency of herring eggs makes it an easy matter to thus secure large quantities with but comparatively little effort. Countless millions of eggs are in this manner destroyed by the Indians. It is doubtful whether this practice of the Indians should longer be permitted.”

Note, it is also about this time that Legislation is introduced to the territorial legislature (and perhaps Congress as I recall) to ban the reduction of herring, or harvesting other fish for non-food purposes. So there is this attitude of “non-wastefulness” at the time, which gets twisted in cultural context and comes out in rather perversely in Evermann's statement....which is clearly referring to a food use.

Table 2.1 Tlingit Herring Resource Management Strategies

Supply Side	Demand Side
<i>Preservation and storage</i> (drying, freezing, etc to temporally redistribute supply)	<i>Territoriality</i> (to prevent damage to spawning stocks and their habitats)
<i>Trade and exchange</i> (e.g., herring eggs for eulachon oil to spatially redistribute supply)	<i>Mobility</i> (e.g., redistribute people in relation to resources threatened with overexploitation)
<i>Habitat conservation</i> (e.g., of spawning grounds to insure sustained reproduction)	<i>Prescriptions and taboos</i> (quieting the spawning area, inviting the herring in, not harvesting eggs after dark, "The Watchman," etc.)
<i>Habitat cultivation</i> (e.g., placing branches or other substrate to increase spawning in certain areas)	<i>Predator control</i> (e.g., of sea lions preying on spawning herring)
<i>Return of viable egg deposits</i> (e.g., placing thinner egg deposits back in the productive "band" of intertidal area for hatching)	<i>Prey choice</i> (e.g., switching to seal oil when herring become too sparse to harvest; or choosing not to harvest an egg deposition)
<i>Transplantation</i> (of eggs to new areas or to restore old areas)	<i>Substrate choice</i> (switching from kelp to another substrate if kelp beds are stressed)
<i>Efficiency innovation</i> (consumption of "mash," etc.)	<i>Sabotage/sanction of hoarders</i> (e.g., freeing herring from overcrowded pounds that wastefully destroy fish)

discussed above, was usually obeyed among his own group, based on his accepted expertise, authority, and wisdom concerning how a particular watershed or spawning ground should be regulated to benefit the group as a whole. Thus, only rarely did he have to resort to more physical tactics to limit fishing or other activities that might be detrimental to the herring supply. But this is not always the case, particularly when there was competition or conflicting demand between groups. In Klawock there are clear cases of territorial behavior. Outsiders that disturbed or fished too close to the spawning grounds would be sanctioned. Clara Peratrovich remembers an incident from the mid twentieth century:

Years ago, right in the main spawning ground there was only one boat that used to bait fish, seine, and they called him Big Andy. He was a big guy. Well,