

## **Abalone Recovery Priorities – Second Draft**

### Recovery Plan

Develop a pinto abalone recovery plan for Alaska. The goal will be to produce a long-term strategy aimed at helping stocks recover to a sustainable level while providing for some harvest by Alaska residents. Development of a plan should include public workshops in S.E. communities. Formal adoption of a recovery plan by the State of Alaska would provide the best foundation for long-term recovery activities.

### Habitat Suitability Modeling

A predictive habitat suitability model will be developed using results of the “knowledge mapping” process, biological shoreline data from NOAA’s Shorezone program, distance from open ocean, and kelp canopy cover. This model can be a key tool in helping focus population abundance surveys and developing projections for the relative health of abalone stocks in S.E. The model also can be used to identify the best areas for establishing nurseries and release of hatchery-produced juveniles.

### Population Surveys

Expand population surveys beyond Sitka Sound to encompass the primary range of pinto abalone in Alaska, including the outer S.E. coast from Sitka to Prince of Wales and Ketchikan to Dixon Entrance. Using “knowledge mapping” and other tools, the surveys can be focused in smaller areas to provide estimates of the relative health of the stocks.

The surveys can be stratified into four geographic areas. The habitat suitability model will help identify potential survey sites within each area into low, medium and high abalone densities. Using an optimal sampling strategy, randomly allocate survey sites within each geographic and density strata.

Data from these surveys will be analyzed to determine the extent to which: adult densities and nearest-neighbor distances are sufficient for successful fertilization; the population’s size structure (small, medium, large) is healthy; and metrics differ as a function of geography, sea otter predation and human harvests. The habitat model can be fine-tuned with these results and the state will have reliable data to use when developing management strategies.

A second set of surveys will focus on the 130 sites ADFG surveyed between 1976 and 1982. These areas will be examined following the protocols used in the earlier surveys as well as the updated methodology. The data can be used to estimate population decline and geographic contraction, and to examine the effects of otter predation and human harvest.

A longer term monitoring plan will be developed to follow changes in abalone populations, reproduction rates and intensity of otter predation.

### Management

Alaska is the only place on the West Coast that allows harvests of abalone. While the bag limits are relatively small and no commercial harvests are allowed, ADFG doesn't know how many abalones are taken and who the harvesters are. More information can be obtained by surveying local fish and game advisory committees, sport harvest organizations and dive shops can be surveyed, and Native organizations can provide feedback on subsistence harvests. Results of the population surveys certainly will help managers, but public opinion also is critical. The community workshops might be useful venues for gauging public opinion about current management strategies. Should there be any harvests until the stocks reach a sustainable level? If so, how about creating spawning sanctuaries where no harvests are allowed? How about establishing a maximum shell size to protect the most prolific spawners?

### Hatchery/Nursery

Abalone recovery programs in California, Washington and British Columbia all have utilized aquaculture as a primary tool in recovery efforts and it is important to determine its role in Alaska.

Alutiiq Pride Shellfish Hatchery's early success with producing pinto abalone larvae and juveniles is encouraging, but it is vital to continue spawning and growth trials to gather knowledge and develop standard protocols. Finding a nursery location close to the stocking area might be the best strategy to decrease transportation stress prior to release into the wild and reduce holding costs.

It will be important to closely track the real costs of the hatchery and nursery components to help determine if aquaculture could be a cost-effective recovery tool. A key issue will be the size of juvenile abalone for stocking programs; the

other Pacific Coast recovery programs are experimenting with out-planting sizes ranging from larvae to six-year-old adults.

Also important is to develop methods of tracking the success of stocking programs, such as tagging, insertion of electronic tracking devices or through genetics.

### Genetics

Introduction of hatchery-reared juvenile to the marine environment will require approval by ADFG genetics and pathology sections. The lab will require submission of samples from a number of wild abalones to test for variation within a geographic area. Samples can be collected during surveys without harming the donors.

### Abalone Recovery Symposium

A high profile symposium in Alaska on abalone recovery efforts would attract abalone experts from around the world. A decade gap between major symposiums is likely to appeal to scientists, fisheries managers, NGOs and others interested in helping troubled abalone stocks recover from over-fishing and other problems. Sharing information is the best way for everyone to move forward.

### Ocean Acidification

Research has shown that abalones are vulnerable to low pH levels in the marine environment during metamorphosis. The working group will closely follow OA trends in Alaska and ongoing research into the effects on abalone.

### Funding

Work collaboratively with ADFG on submission of an application to NOAA's Species Recovery Grants to States to fund development and implementation of a comprehensive, long-term strategy to improve the status of pinto abalone populations in S.E. Alaska. Pursue other funding opportunities as they arise.