

Gathering a future

"The hand," says Peter Greenaway, "cannot write upon itself." And so the world is divided into individual beings, not to fight each other, but so that each can influence and color and strengthen the others.

Life is pretty much a series of conjoinings and divisions. Ask any parent of a teenager, or an amoeba, or a water molecule. Or spend a day with the North Pacific Fishery Management Council, and see if what divides people isn't what also joins them together, week after contentious week. They're like an ocean fighting with itself. The fisheries of the North Pacific have gone through a joining period, having come together to displace (or absorb) foreign interests, and now they are in their inevitable divisive phase, arguing back and forth over who gets how much of what.

Fisheries development inevitably endures the same cycles. For the past few years, fisheries development work in the North Pacific, by companies and organizations, has focused on individual projects and programs that appear unrelated. A pinbone pulling machine here, a bycatch reduction effort there. An arrowtooth flounder surimi project that never did make anybody's socks go up and down.

You'll read in these pages that AFDF is engaged in a number of interesting projects that, each in their own way, pave new ground for seafood industry development. An interactive computer program could give trawl fisherman an entree into a directed arrowtooth flounder fishery, which represents the last great untapped fin-fish resource of the North Pacific. Another project is taking spec-processed high-quality salmon, produced by small salmon processors in Western Alaska, to the Midwest and Florida and the International Boston Seafood Show. The Symphony of Salmon brings the rest of the nation here, to Alaska, to taste and evaluate the newest and best in alternative salmon products. One of our biggest projects in a long time is a multi-year experiment with small-pollock escape panels in trawl gear, a project that provides ground-truth about escape panels and pollock survival for the first time ever.

What's the link?

The goal of fisheries development remains as it has always been: To extract the maximum sustainable value from the fisheries resources harvested. Basically, this means three things: Ensuring the long-term productivity of the resource, minimizing waste, and creating the highest-value products possible. Each of AFDF's projects works toward at least one of these goals—and they are the important issues at hand. Even halibut bycatch reduction in the trawl gear fisheries, a sensational and hyper-publicized issue in today's fisheries, is a political problem and not a fisheries development one. (At 4%, the trawl fisheries halibut

bycatch rate is among the lowest in the world. And even so, it's politics, not conservation, that demands that only longliners land halibut.)

Two critical challenges comprise the task of fisheries development today. First is the challenge of modernizing an over-extended industry, to bring it up to date so that it can compete in today's world economy, support its laborers and investors, and live up to tomorrow's standards for environmental healthfulness and stewardship. The seafood industry of the North Pacific prides itself on being conservatively managed, and so far it has successfully avoided most of the overfishing problems other seas have suffered. The public now is calling for increased environmental stewardship. While the goals of the environmental community and the goals of the seafood industry sometimes differ (as in the case of the pollock fishery and its interaction with the Stellar sea lion population) the objectives of both communities are the same: To maintain a sustainable marine ecosystem that supports marine mammals, plankton, fish, sea birds, harvesters and families for centuries to come.

Modernization of the industry means increasing efficiency, decreasing waste, minimizing deleterious effects on the marine ecosystem, generating economic vitality and enhancing the long-term management tools of the North Pacific.

The second most critical challenge lies in creating economic opportunity in the nation's coastal communities. Villages and towns along thousands of miles of shoreline, from Point Wales to Coos Bay, are peopled with folks who live on the economic edge, and whose businesses have few resources and fewer opportunities to modernize and compete. Western Alaska presents the biggest challenge here. How do we balance the modernization of the industry with the fact that the people with the fewest resources are the first to lose out when the industry takes a giant step forward?

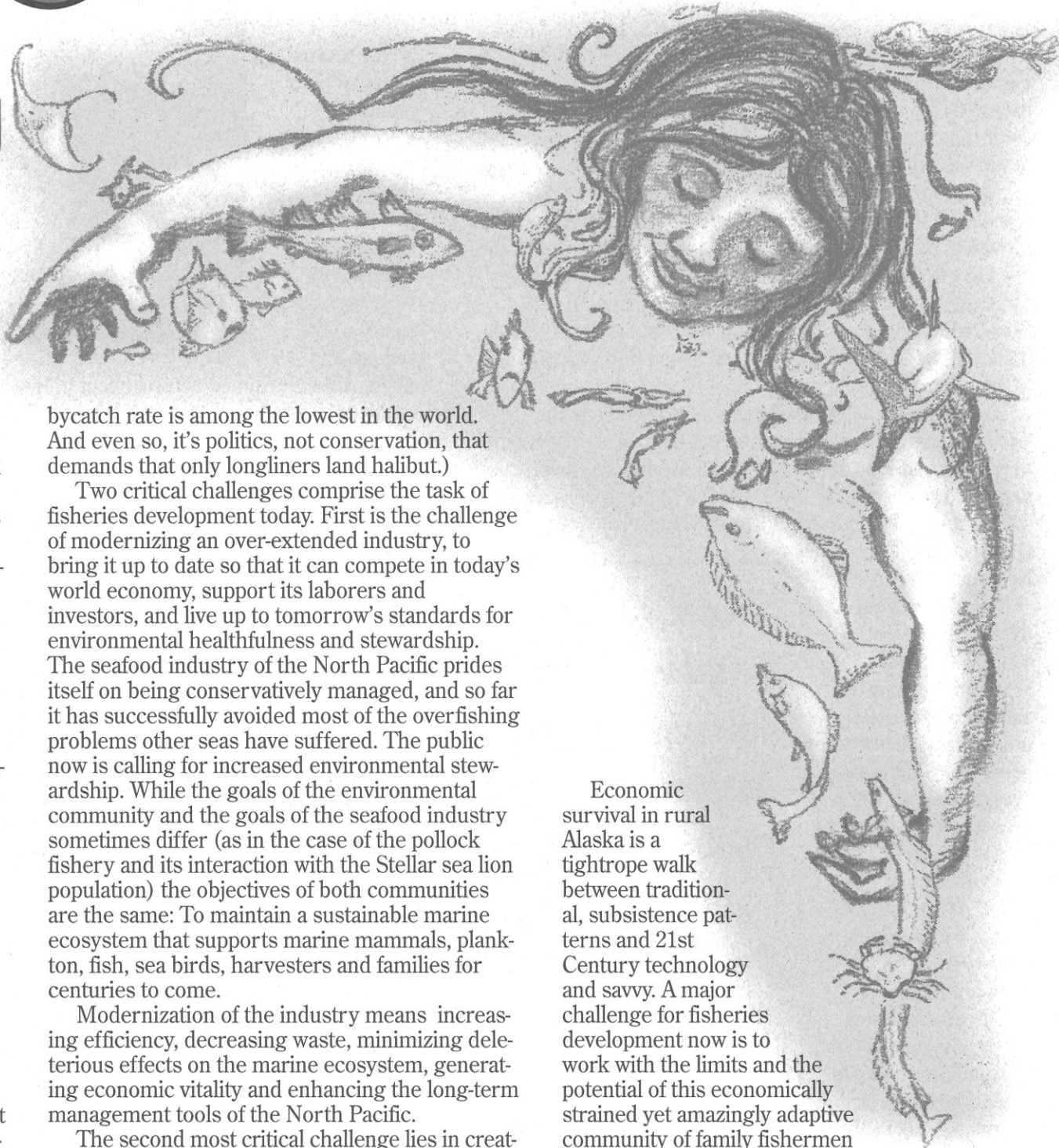
In Western Alaska, fishing is not and never has been an industry. It is a way of living, a pattern of life. Harvesting fish is one aspect of a whole, holistic seasonal cycle of activities by which Native Alaskans and rural people make their living in a harsh land. This way of living does not change when farmed fish suddenly take over the international salmon market. Fishing has been a way of life for thousands of years along Alaska's windswept coast; an abrupt shift on the commercial seafood market is not likely to induce a smooth and swift response from these communities. There are not only acute economic difficulties, but social and cultural traditions that can only evolve over time.

Economic survival in rural Alaska is a tightrope walk between traditional, subsistence patterns and 21st Century technology and savvy. A major challenge for fisheries development now is to work with the limits and the potential of this economically strained yet amazingly adaptive community of family fishermen and small processors, to use its strengths and work with its weaknesses to create a healthy, modern seafood industry that feeds people and encourages both economic and biological renewal.

A hand cannot write upon itself. It is up to individuals—each of us part of the whole—to develop a healthy system that sustains all.

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Running Strong:

Western Alaska's premier salmon -alternative to generic farmed fish

Western Alaska produces the richest, wildest of the wild Pacific salmon. Scientifically proven to contain more omega-3 oils, richer flavor and, in a lot of cases, brighter color than most wild salmon, these Western Alaska jewels of the sea are perfect for the picky seafood market.

"Seafood purveyors and restaurants are looking for something unique, and that's what Western Alaska salmon provides," said salmon processor Lloyd Stiassny after three days in a booth at the International Boston Seafood Show. Stiassny, general manager of the Native village-owned Maserculiq salmon processor in Marshall, Alaska, helped man the Boston booth for AFDF's Western Alaska Salmon Marketing Program.

The program helps small salmon producers in the Arctic-Yukon-Kuskowkim region get their best product into new retail and food service markets. Under the quality-inspected Arctic Keta® label, small coastal processors are selling their salmon to folks who have never heard of Quinhagak or Kotzebue.

In a world dominated by generic farmed salmon, Western Alaska wild salmon offers a rich, unique product with a great story behind it. "People are looking for something that differentiates their business, that sets them apart," Stiassny said. "They are genuinely interested in wild Alaska product."

He talked to hundreds of people about the qualities, benefits and perplexities of Western Alaska salmon. "Most people I talked to do know the uniqueness of wild fish from Western Alaska vs. farmed fish," he said. "But there were a lot of people from small gourmet restaurants who have only used farmed, and were not aware of the benefits of working with wild salmon. So in that sense, there is a lot of education to be done."

With a good booth setup, a brand-new full-color brochure and an intriguing story about the traditional way of life that produces Western Alaska's Arctic Keta-brand salmon, AFDF project manager Cheryl Cummings and seafood marketing expert Pat Shanahan tried to make the presence of Western Alaska salmon known among potential customers.

"The Arctic Keta salmon story helps to sell the product," said project manager Cheryl Cummings. "People get romanced by the story of this salmon harvested by families in traditional Native villages."

Taste our natural way of life, begins the Arctic Keta story printed on every brochure, poster and recipe card. *In the rugged terrain of Western Alaska, far from the well traveled parts of the state, life still revolves around the seasonal gathering of food...*

"People don't just buy food," Cummings said. "They buy stories. Why should they pay money for something they've

never seen or heard of before? Because they like the story that comes with it. Our story engages the consumer in a vicarious experience of the region, and makes them feel good about buying it. But it's really the quality of the product that makes people buy it a second time."

Brand identity

What's the difference between a commodity product and a coveted one? Brand identity. Kids don't buy tennies, they buy Adidas. AFDF helped Western Alaska producers establish a brand identity for their salmon by registering the Arctic Keta name and the "Taste Our Natural Way of Life®" slogan with the trademark office.

All Arctic Keta product is independently inspected by Surefish, Inc. for quality and consistency, according to specifications agreed upon with potential buyers. Only the product that passes inspection gets included in the program.

"Buyers know that the processors who participate in the Arctic Keta program have made a commitment to quality, and have invested a lot to make this product successful for everyone," Cummings said.

Florida debut

This April and May, Arctic Keta salmon debuts at a 9-restaurant chain in Florida during an 8-week promotion. Cummings and seafood marketing consultant Pat Shanahan flew down to participate in a press luncheon, talk up Arctic Keta on live TV, educate wait staff, and perform the hundred other chores necessary for a large-scale promotion like this.

"By the end of May, customers thousands of miles away will know what Arctic Keta salmon is," Cummings said. "That's the goal. The product speaks for itself."



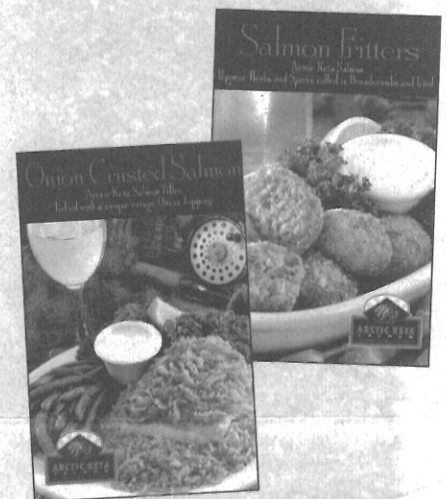
Goals:

To find new markets for salmon from Western Alaska;

To establish an identity for Western Alaska salmon, including quality standards and exclusive quality labeling; and

To generate a buying frenzy among targeted U.S. buyers for the unique qualities of Western Alaska salmon.

"People are looking for something that differentiates their business, that sets them apart. They are genuinely interested in wild Alaska product."

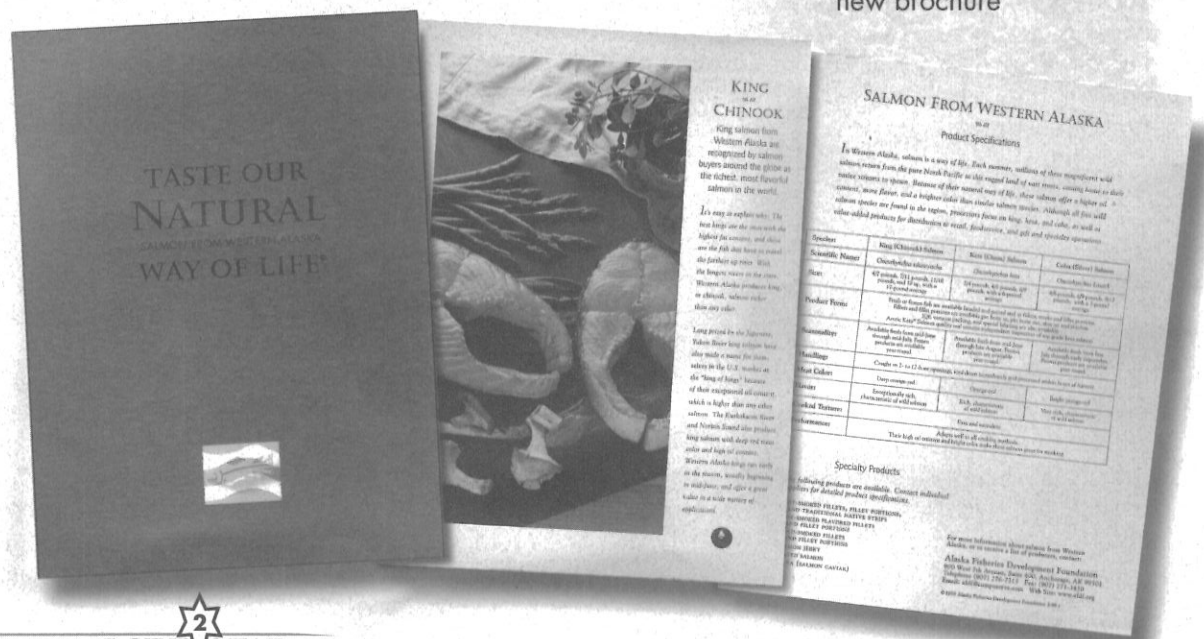


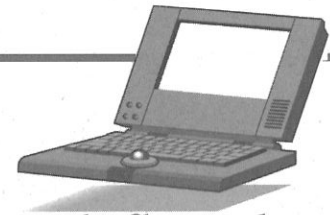
Support:

The Arctic Keta® program provides quality-inspected product, brochures, recipe cards, staff education and a lot of support for companies interested in test-marketing this product.

For information, call Cheryl Cummings at, (907) 276-7315.

Below is a peek at the new brochure





Digitizing the deep:

Can a computer program unlock the arrowtooth flounder fishery?

Project goal:

This project demonstrated a prototype computer-based expert system designed to help harvesters and fishery managers target the best fishing methods by area, speed, depth, time of day and other factors.

Findings:

The computer program has great potential as a research tool, management tool and also by the fleet to help reduce bycatches. However, to be useful it needs to be expanded. A comprehensive database would require significant commitment from the National Marine Fisheries Service and the National Oceanic and Atmospheric Administration. Until that happens, the expert system as created will probably remain a prototype.

Collaborators in AFDF's "Digitizing the Deep" project demonstrated their prototype computer program to fishermen in March, showing for the first time how an interactive expert system can answer questions like, "At this time of year, what area will yield the most arrowtooth flounder with the least bycatch, and at what depth and tow speed?"

The system isn't usable yet—it's based on incomplete data and a lot of confidential information—but so far the project has demonstrated that a computer-based expert system of this kind could be extremely useful for harvesters and fishery managers in unlocking some of the bycatch problems in the North Pacific.

Chris Bublitz of the University of Alaska Fairbanks Fishery Industrial Technology Center (FITC) along with Brenda Norcross and Franz Mueter of the University's Institute of Marine Sciences, have worked with historic catch data, including time, area, depth, tow speed, catch mix and other factors, of groundfish catches in the Gulf of Alaska. The computer program allows users to ask questions like, "Will reducing my tow speed in this area decrease my halibut bycatch?"

Fishermen liked it

"There is definite interest among trawlers for this program," said Al Burch of Alaska Dragger's Association. "If this program could be broadened to include cod, pollock, rex and rock sole, where we could avoid the high bycatch areas, it would definitely be used."

Burch and other Kodiak fishermen are requesting disk copies of their own catch data from NMFS, and plan to feed it to Bublitz to create their own personalized version of the program using only their own vessel's data. The fleet, he agreed, is enthusiastic about having an on-board computer

program that could help them decrease bycatches and better target the species they want.

"Once a few boats get hold of it, there's going to be a lot of interest. The guys will update it daily."

The obstacles

The first obstacle is that the program is based on a lot of confidential information collected from logbooks and observer data by the National Marine Fisheries Service. There are strict limits on how this information can be used. For demonstration purposes, all the data are skewed so that the outputs lose their identity. But to be usable, the program would have to be designed according to the "onesy-twosy rule," Norcross said.

"Say there's one processor in a port and you publish their data, everyone knows what he is doing. If there are two processors in a port and you publish the data, everyone knows what both of them are doing, but not who is doing what. However, they know what each other is doing. Therefore, you need to have data on at least three. Then everyone knows what all are doing, each one knows only what the other two are doing collectively, and no one knows what an individual is doing."

Researchers are grappling with questions about how confidential data may / may not be used in research. Burch, however, said Kodiak trawlers are more interested in using the information as a tool than about protecting the data from each other.

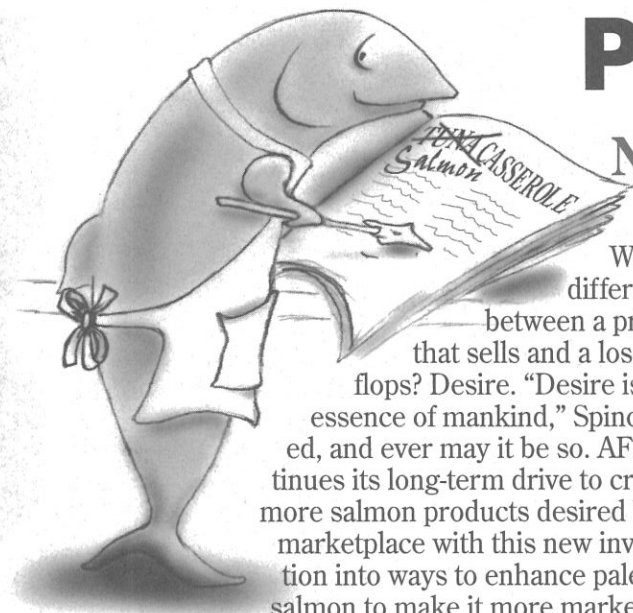
"I haven't heard any problems from fishermen about confidentiality," he said. "There was frustration that confidentiality is being used as an excuse to not go forward with it."

AFDF will publish a final report on this project in July. See full story on AFDF's web site: www.afdf.org

PALE-MEATED SALMON

Pale but Hale

New opportunities for salmon producers



What's the difference between a product that sells and a loser that flops? Desire. "Desire is the essence of mankind," Spinoza spouted, and ever may it be so. AFDF continues its long-term drive to create more salmon products desired by the marketplace with this new investigation into ways to enhance pale-meated salmon to make it more marketable, to

enhance its flavor and texture, and to help increase the overall value of Alaska's salmon.

What makes the hale salmon so pale? Nature. Some are naturally just lower in pigment and in oils, but just as palatable and functional in recipes. Traditionally, pale-meated salmon have been canned but, what with dive-bombing canned salmon markets, AFDF seeks to help the pale-meated pink and chum salmon find some new career paths.

The best opportunity for pale-meated chums and pinks: as an ingredient in prepared foods, according to previous research done by AFDF and a number of other outfits. "There's a huge market for a versatile ingredient in secondary processed foods," said Chris Mitchell, AFDF executive director. "There's just no question that this portion of Alaska's salmon pack could yield far higher revenues if it were just produced in a form that secondary food processors can use."

AFDF teams up with The Alliance Group and the University of Alaska's Fishery Industrial Technology Center (FITC) for this project. From previous studies at AFDF, we have learned that a variety of secondary food processors—sandwich, salad, pasta and soup/sauce manufacturers—are interested in exploring salmon as an ingredient in their finished products. We have established a general set of product profiles specifying color, flavor, texture, format, additives and ingredients, and pricing. The challenge now: to work with some of Alaska's wild pink salmon pack of 1999 to produce sample amounts of product according to customers' specifications, and walk the new product through the manufacturing process in potential customers' plants.

Color, for example, is a big issue for secondary food processors. Unlike customers of canned salmon, they need their ingredients to be uniform in color. And they need product in a usable format—a convenient retort pouch or in a cooked refrigerated/frozen format, most likely.

"We are interested in building on the pouched salmon technology that already has been developed," Mitchell said. "We know from secondary processors that the pouched salmon is a great idea but there's too much moisture in it and the flesh is not firm enough for most food manufacturing processes. So we'll be experimenting with ways to improve upon what's already available."

For more information contact Chris Mitchell, 907-276-7315

Project goal:

To create higher-value markets for a portion of Alaska's salmon pack that now is undervalued.

The Target:

Tuna is the product this project is attempting to clone. AFDF understands from its contacts in the marketplace that a new and more alluring product such as salmon would be an attractive draw to consumer.

The project began this spring, and continues into early 2000. This project is funded by a grant from the Alaska Science & Technology Foundation.

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United Salmon Association

Wards Cove
Packing Company

ANCO Foodservice

Surefish

Hot & getting Hotter: The Symphony of Salmon™ cooks

Alaska salmon is hot and getting hotter. Once the king of the can, Alaska salmon now sings a symphony of tunes. At this year's Symphony of Salmon, held on a -10° day in Anchorage, throngs of people melted a path to the Glacier BrewHouse door to swing to the Back Street Blues Band and gnosh on the hottest and the coolest of wild Alaska salmon's new products.

Take a look at all the new, non-traditional salmon dishes, listed at right: Emily's Velvet-Smoked Rosemary & Sage fillets; Arpeggio's Smoked Salmon Caviar; a salmon salad pack with vegetables and white beans made by Northern Discovery Seafoods. This year's 23 retail, food service and gift/specialty entries in the Symphony of Salmon new-products contest show off what's best about Alaska wild salmon: rich flavor, beautiful presentation, and a cornucopia of uses.

"These products have enormous potential," said Phil Lempert, the Today Show's "Supermarket Guru" and one of six judges for the 1999 Symphony of Salmon contest (see list of judges at left.) Grand prize winner was the "Lox Sampler Package," by Anchorage-based Trapper's Creek Smoking Company, a tray of center-cut cold-smoked sockeye, silver and halibut. Judges liked its complex flavors. "It's hard to accomplish a delicate, complex flavor profile that really brings out the fish without any taste of smoke," said judge Pat Shanahan.

"It's a primer to get people into seafood," Lempert said about the Lox Sampler Package. "It's a great idea."

Trapper's Creek's package also won first place in the Gift/Specialty category. Taking first in the retail was Salmon Mediterranean "New Seafood Classics Varieties™," made by AquaCuisine, a medley of cooked salmon pieces with pre-cooked pasta—a MRE (meal ready-to-eat, in the vernacular) with a 60-day shelf life that AquaCuisine calls revolutionary.

"The concept and packaging are on the money," said judge Michael Klein of the Salmon Mediterranean. "It hit a lot of chords."

Trapper's Creek also won first prize in the food service category with a "Kippered Bits and Pieces," another smoked salmon collection that company president Andrea Wahry says is a perfect ingredient for salads, soups, pastas or pizza topping.

Speaking of pizza....

No contemporary family table is complete without one. This year SeaBear Smokehouse took the People's Choice retail award with their "Smokehouse Pizza," a 9-inch thick-crust pizza topped with smoked chum salmon. The pizza was the fave among the 250 or so folks milling about the sample tables and diligently filling in their People's Choice ballots at the Symphony event.



Al Levensohn

Eyes flew open wide at Ocean Beauty Seafoods' "King Salmon Florentine Roulade," a boneless, skinless fillet stuffed with spinach, sweet cream and herbs. "I'd serve that in my own restaurant," said Al Levensohn, executive chef of the tony Westin Alyeska Prince Hotel, who prepared the 23 entries for the official judging segment of the contest, and helped BrewHouse

chef Farroukh Larijani at the BrewHouse the following day.

Copper River Seafoods won the people's choice in the gift/specialty category with its "Copper River Smoked Salmon Under Glass," a tasty variation on the smoked salmon theme.

"The People's Choice award is almost never the same as the top award given by the official judges," said AFDF's Chris Mitchell. "The official judges grade each product on quality, packaging, marketability and value. The people just taste and vote for whatever they like. It's interesting to see the difference."



Advice from the judges

The judges spent three hours tasting, inspecting, evaluating and contemplating the Symphony entries in private on the day before the public tasting, in a process they called both fun and exhausting. From their various points of view, these chefs, buyers, restaurateurs and marketing specialists had some pretty specific advice for producers of Alaska salmon products. They offered four

major instructions to salmon producers:

Sell the sizzle. Make consumers want to buy your product.

Romance the packaging. Tell buyers what's special about your product.

Give consumers more information. What are they getting? How should they handle and prepare it? Don't assume they know everything they need to know about your product.

Easy on the smoke. Some products tasted more of smoke than of salmon.

"Most of the producers need to focus more on the consumer they're trying to target," said Lempert. "Sure, your product is great, but how are you going to get people to fall in love with it?"

From a practical standpoint, said premium seafood buyer Klein, make sure you are giving your customers everything they need—not only a high-quality product, but all the information, ease of use, and interest in the product that will make them feel comfortable with using it.

"Don't just sell fish," Klein said. "Sell the unique story of your salmon."

Check out our web site (www.afdf.org) for more information, including the following:

A list of participants with contact information;

Photos of this year's and last year's winners;

Photos and pricelist for Symphony of Salmon Memorabilia and Logo Items (like our 13-inch dinner plates!).



Grand Prize

Lox Sampler Package

Trapper's Creek Smoking Company

Retail

1st - *Salmon Mediterranean New Seafood Classics Varieties™* - AquaCuisine

2nd - *Classic Char-Grilled Salmon* - Gorton's

3rd - *Salmon Jerky-Regular* - Trapper's Creek Smoking Company

Food Service

1st - *Kipperd Bits and Pieces* - Trapper's Creek Smoking Company

2nd - *Morey's King Salmon Spread* - Morey Fish Company

3rd - *King Salmon Florentine Roulade* - Ocean Beauty Seafoods, Inc.

Gift/Specialty

1st - *Lox Sampler Package* - Trapper's Creek Smoking Company

2nd - *Arpeggio's Smoked Salmon Caviar* - Arpeggio's

3rd - *Smoked Salmon Sport Chew™* - Alaskan Dried Foods

Pet Products

1st - *Alaskan Select Salmon for Cats* - D.C. Cuisine

2nd - *Yummy Chummies Salmon Crunchies (Smoked)* - 4-Paws

3rd - *WAGS (Wild Alaska Grown Salmon) Premium Pet Treats* - Zoic Resources, Inc.

People's Choice

Retail - *Smokehouse Pizza* - SeaBear Smokehouse

Food Service - *King Salmon Florentine Roulade* - Ocean Beauty Seafoods, Inc.

Gift/Specialty - *Copper River Smoked Salmon Under Glass* - Copper River Seafoods

Pet Products - *Yummy Chummies Salmon Crunchies (Smoked)* - 4-Paws

1999 Judges

Phil Lempert: Phil is a food correspondent for NBC News' TODAY Show, a syndicated newspaper columnist and a contributing Editor for USA Today. He's written Supermarket Shopping, and hosts "Shopping Smart", a weekly live call-in radio show which airs in over 90 cities nationwide. www.supermarketguru.com.

Roger Berkowitz: Roger is the President and CEO of Legal Sea Foods of Boston, one of the most successful seafood restaurant firms in the entire country with awards like "Fine Dining Hall of Fame"—Nation's Restaurant News, and "Best Seafood Restaurant in America"—NBC Today Show.

Michael Klein: Michael is Merchandising Manager of specialty foods for the world-famous Harry & David Catalog. In 1994, he formed The Culinary Muse, a firm focused on marketing specialty food products through retailers and manufacturers.

Pat Shanahan: Pat of Strategic Planning & Communications consults with the seafood industry regarding marketing communications, marketing planning, new product development and consumer trends. She manages the new product seminars for show organizers at the International Boston and San Francisco Seafood Shows.

Carl Salamone: Carl is the Seafood Director for Wegmans Food Market; a major northeast 56-store grocery chain headquartered in Rochester, New York. A Wall Street Journal article named it "Best Supermarket in the World."

Attila Szabo: Attila has been in the restaurant and hospitality business for 14 years and is the Senior General Manager for Simon & Seafort's Saloon and Grill, a Restaurants Unlimited™ property in downtown Anchorage.

1999 Alaska Symphony of Salmon™



1999 Participants

Food Service

Ocean Beauty King Salmon Florentine Roulade
Ocean Beauty Seafoods, Inc.

Icicle Spicy Salmon Shooters
Icicle Seafoods, Inc.

Alder Smoked Sockeye Portion
Copper River Seafoods, Inc.

Morey's King Salmon Spread
Morey Fish Company

Alaskan Heritage Oven Ready Smoked Salmon™
Alaskan Dried Foods

Kipperd Bits and Pieces
Trapper's Creek Smoking Co.

Retail

Portlock Brand – Basil Tequila Salmon
Icicle Seafoods, Inc.

Premium Alaskan Salmon Poached in Dill Sauce
Trident Seafoods

Velvet Smoked Wild Alaskan Salmon – Rosemary & Sage
Emily's Kitchen

Marinated Planked Salmon
Deep Creek Custom Packing, Inc.

Fire Paté
Kasilof Fish Company

Classic Char-Grilled Salmon
Gorton's

Salmon Jerky - Regular
Trapper's Creek Smoking Co.

Salmon Mediterranean New Seafood Classics™
AquaCuisine, Inc.

Smokehouse Pizza
SeaBear Smokehouse

Alaskan Heritage Smoked "Swim Jim" Coho Salmon
Alaskan Dried Foods

Gift/Specialty

Arpeggio's Smoked Salmon Caviar
Arpeggio's

Alaskan Ap'ertif – Smoked Wild Alaska Salmon Salad
Northern Discovery Seafoods, Inc.

Copper River Smoked Salmon Under Glass
Copper River Seafoods, Inc.

Smokehouse Buffet Tower
SeaBear Smokehouse

Lox Sampler Pack
Trapper's Creek Smoking Co.

Smoked Salmon Caviar Paté
Ugashik Wild Salmon Co.

Smoked Salmon Sport Chew™
Alaskan Dried Foods

Pet Products

Yummy Chummies – Dog Treat
Yummy Chummies – Cat Treat
Yummy Chummies Salmon Crunchies – Smoked
4-Paws

Alaska Select Salmon for Cats
Alaska Chum Chips
D.C. Cuisine

The Original Alaska Salmon Cookie
Lupe Ray's

Iditabone
Mactad Productions

Alaskan Salmon Snackers
Twin Rocks Enterprises, Inc. - Cohoe Micro Bakery

WAGS (Wild Alaska Grown Salmon Treat)
Zoic Resources, Inc.

Surviving the Great Escape

Even though escape panels sharply reduce bycatch of undersized pollock, should mortalities from injuries be figured into catch estimates?

PROJECT RESULTS

Complex research collaboration between a multitude of groups, working toward a single goal, can be successful if well organized;

Extraordinary numbers of small pollock escaping the trawl gear;

Even though most small pollock survive escapement, approximately 46 to 84% of them may die later;

The smaller the pollock the higher their mortality after escaping from trawl gear;

Many of the fish that died showed significant bruising, probably sustained while inside of the trawl and during escapement through trawl meshes.

These results apply only to small pollock catches (< 1.5 t) during daylight hours at specific water temperatures.

Bottom diagram:

Top-panel cover herding fish that are passing through square meshes. Tows were conducted with the rear gate open until the end of the tow. The caging system was comprised of two cages attached to the terminal end of the cover.

A midafternoon mist hangs like laundry over Ouzinkie Narrows, on the north side of Kodiak Island as the F/V Peggy Jo pulls away from the crowded dock like a Volvo out of a tight parking spot. Scent of salt air, diesel, wet creosote and a fair wind mix on deck as Kodiak recedes behind the stern ramp and the ship noses into a wadded-up dishrag of sea.

Researchers aboard the *Peggy Jo* went on, that May week in the Gulf of Alaska, to conduct ground-breaking research of the survival rates of under-sized pollock escaping through square-mesh panels in commercial trawl gear. While the effectiveness of escape panels in trawl gear had been proven, in previous field tests of this multi-year project, never before had the escaping pollock tots been collected and monitored for longer than a day or two after capture.

"This truly is key research," said team leader Ellen Pikitch of the Wildlife Conservation Society. "The industry is investing so much in escape panel technology to reduce bycatch of small pollock. But the missing piece of information is: do the escapees survive? That's a critical question, because if they escape from trawls and swim off to die uncounted, that's worse than doing nothing."

The setup

The 100-ft. *Peggy Jo*, skippered by Brian Beaver, towed pelagic trawl gear fitted with an escape panel affixed either to the codend or to the forward extension (intermediate) segment of the net (see illustration). A specially designed top-panel cover was fitted over the escape panel, and served to "herd" escaping fish into a collection cage attached to the rearward end of the cover. Each cage was a web-sided stainless-steel cube, 1.7 meters on a side, designed with front and rear gates held open with latch releases. Each was fitted with marker buoys so it could be retrieved after release from the trawl gear. Low-light third-wire video cameras, affixed to the panel cover, codend and the cage system, videotaped escapees moving through the panel cover and the collection cage while researchers watched on monitors in the wheelhouse.

As the trawl gear moved through a school of pollock, small fish escaped through the square-mesh panel and were seen entering the panel cover. The fish would swim along with the cage for a few moments, even when both gates were open, before falling back into the open sea—their optomotor reflex at work. When the researchers decided to close the back gate to begin collecting escapees, they would trigger the latch release device from the wheelhouse, and then could watch on the video screen as the back gate closed and—most of the time—latched. Pollock would begin collecting in the cage.

The goal usually was to collect at least 150 or 200 fish in the cage before triggering the front gate to close. About two minutes later, a timer released the cage from the trawl gear, the cage floated free, and the Kodiak-based *Three Bears* retrieved the cage and towed it ever so slowly to a quiet bay nearby. There the pollock were observed by divers twice a day for the next 14 days.

While the *Peggy Jo* ran its trawl experiments, a Kodiak seiner *Mythos* harvested a control group of pollock by seine net. These pollock were gently transferred into holding cages and also slowly towed to the observation bay, where they were anchored alongside the experimental cages of trawl escapees, and also were monitored for 14 days.

"Watch 'em go!"

Whenever the *Peggy Jo* hit a school of pollock, little escapees fired through the 93-mm square mesh by the hundreds, crowding across the video screen tighter than Duke fans in a sports bar. Escape panels placed in the intermediate, forward of the codend, pre-sort the catch, allowing under-sized pollock to swim free even after the cod end is packed with fish.

"In some cases, the numbers of fish escaping at any single moment was astounding," wrote Dan Erickson, a researcher from the University of Washington Fisheries Research Institute. At one point, 493 escaped pollock were caged in one minute. Most of the fish that escaped through the 93-mm. square meshes were smaller than 38 cm.; very few fish larger than 40 cm. were able to pass through the meshes.

Counting casualties

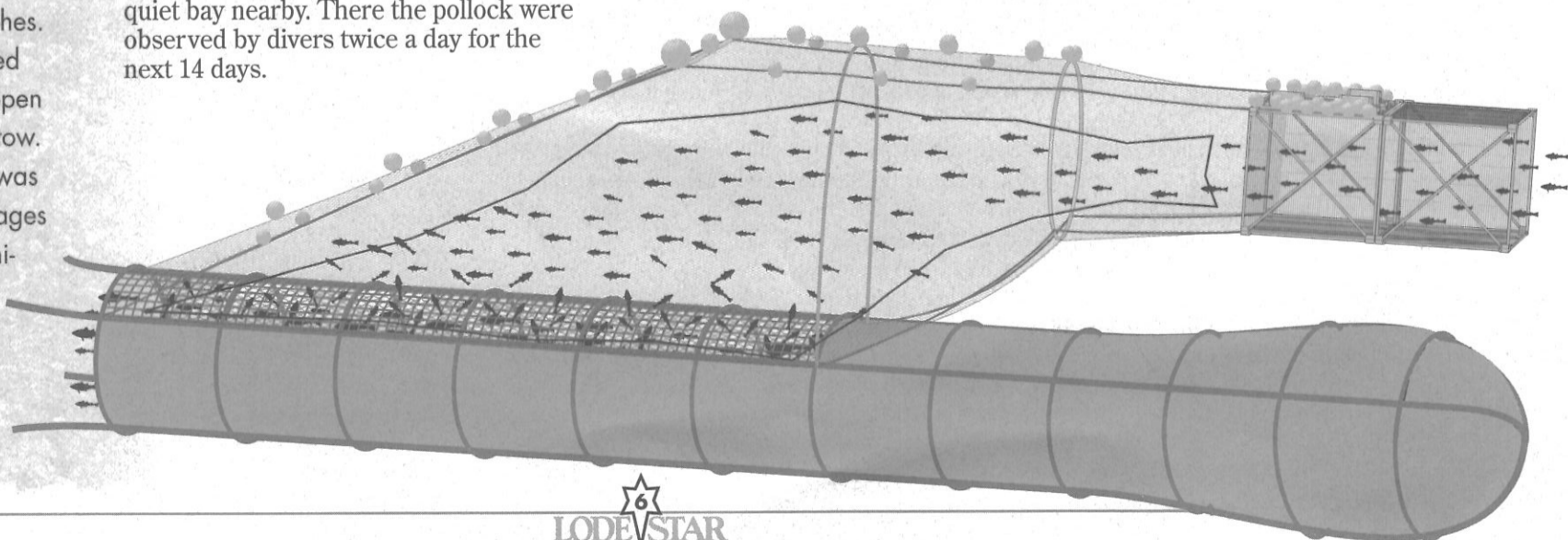
The question of survival of the small pollock that escape is more troubling. This was the first study to follow mortality rates of pollock escapees for longer than a day or two, and results were surprising.

The research team recorded injuries both to the commercial-sized pollock that came up in the trawl gear. Meanwhile, Chris Bublitz of FITC videotaped and documented injuries to the small escapees that were held in the observation cages. Almost all the pollock, large and small, that encountered the trawl gear sustained scrapes to snout, lips and gill cover. On the day after their trawl experience, many of the escapees hung lethargically in their cages, some of them vertically or even upside down. Most that made it through four days post-escapement were in good shape, and visibly recovered their well-being.

Of all the escapees that died, most of them died in the first four days. Smaller fish showed higher mortalities than larger fish—but this size range (25 - 35 cm.) also succumbs to high natural mortality in the open sea.

Overall, mortalities from both escapement and the 14-day caging process were higher than expected. Mortalities ranged from 46 to 84% for fish that wriggled through codend meshes, and 47 to 64% for fish that swam through the intermediate panels. This is a pretty high death rate, compared to other species. (Atlantic cod, for example, are relatively hardy and show far higher survival rates.)

In comparison, mortalities of seine-caught control group fish varied from 2% to 59%. The researchers believe that the highest mortality of the seine-caught fish was caused by the seining process, rather than by caging and transporting the



The Problem:

The success of longlining is largely dependent upon bait, yet Alaskan longliners are still using the same natural baits that New Englanders used in Captains Courageous. If we look back over the last century, we see major advances in vessels, fish detection, navigation, lines, hooks and automated baiting equipment, but almost no advances in the understanding, manipulation and utilization of bait. In an era where human foods are enriched, processed, flavor-enhanced, functionally altered and niche-marketed, it is surprising that so little work has been done on baits.

Great bait

Why Pacific cod don't eat potato chips

First, chips don't hold up after eight hours in the water, like the new artificial bait does. Second, they are more expensive than artificial bait, and third: nobody dropped one in the water while the artificial bait experiments were going on.

Susan Goldhor and Radu Giurca, of the Center for Applied Regional Studies (CARS) in Boston, have been working with Mimi Fielding and Hal Cook from MARCO Marine of Seattle to develop an artificial bait manufactured from MARCO's proprietary matrix combined with seafood processing wastes. This AFDF project aims to make profitable use of processing offal, to help save longliners a lot of money in bait costs every year, and to create a new industry in Alaska: manufacturing bait for the 3,000-vessel longline fleet.

"I talked to a longline skipper recently," said Richard Drake, AFDF project manager, "and asked him what are the top three things he looks for in a bait. He said, 'length of time it stays on hook, the attractiveness to the target fish, cost.' If successful this bait will address all three—and it does so using processed fish wastes. Why not save the food grade fish for luncheon specials, keep the millions of dollars currently spent on bait here in the state, and provide some manufacturing jobs in the process? It's all about process."

What will Pacific cod eat?

They'll eat bait made from pollock. In experiments conducted by the project research team at the Alaska Sea Life Center, Pacific cod caught live and held in seawater tanks

went after manufactured bait, particularly bait that had been soaking eight hours, like a seagull goes after french fries.

The team tested several liquid attractants, then incorporated the most successful of those into MARCO's patented matrix to make solid baits. The liquid baits were introduced to the fish through a nipple, while solid baits were affixed to a monofilament line; each set-up was connected to a motion-activated electrical switch. When the fish touched or mouthed the bait, the switch rang the bell.

"A single ring didn't mean much, because the fish might accidentally brush the apparatus with its tail," Goldhor said. "But when the fish were really attracted to the substance, the bell would ring almost continuously. For one formula, each fish rang the bell so often that we stopped all four of those trials early."

The team also pre-soaked samples to mimic long soak times in commercial longline operations. When the fish were presented with one of the pre-soaked formulas, Goldhor said, the bell just wouldn't stop ringing.

Field trials this summer

Dan Erickson, a fish biologist with the Wildlife Conservation Society, will design and lead the field-trial portion of the study. The team will conduct a series of field trials aboard a longliner, adjusting the formulas between each trial.

"We still need to test the catchability of the bait under commercial fishing conditions," said Cook, manager of MARCO's Longline Division. Eventually, he said, the goal is to develop species-specific bait that could help longliners reduce bycatch.

The Artificial Bait project is funded by a grant from the Alaska Science & Technology Foundation. Full-length story on the web at www.afdf.org

fish. One group accounted for all the high mortality figures. If that group is excluded, seine-caught pollock mortalities ranged from 2% to 15% after 14 days in the observation cages.

No clear solution

Pikitch and Erickson documented that, with an investment of a few thousand dollars, pollock trawlers can greatly reduce the amount of small pollock in their catch. But is reducing the small-fish bycatch a good idea if they die uncounted?

Pikitch and Erickson's report advises that we interpret their results cautiously. "First, these tables do suggest that perhaps 64% (on the average) of the escaping fish may survive," they write. But — "Extensive modeling is needed to clearly evaluate the effects of these escape-mortality levels to the fishery before conclusions are made."

In one sense, it's a case of the answer to one set of questions introducing a multitude more questions. But this important research has given the industry a clearer understanding of how small pollock interact with trawl gear, and how they survive escape panels, than we have had before.

Collaborators in this project:

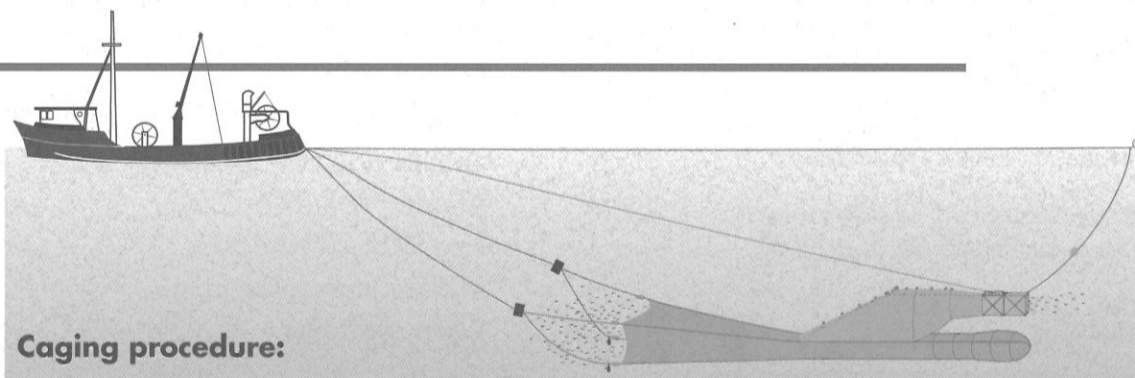
Dan Erickson
University of Washington, Fisheries Research Institute

Ellen Pikitch
Wildlife Conservation Society

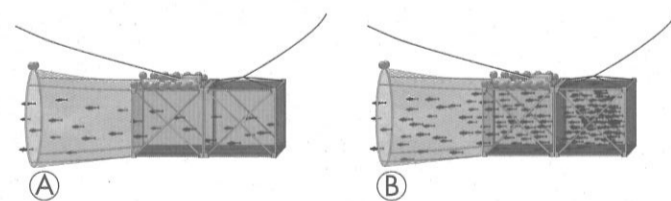
Chris Bublitz and Cat Klinkert
University of Alaska, Fishery Industrial Technology Center

Petri Suuronen and Esa Lehtonen
Finnish Game and Fisheries Research Institute

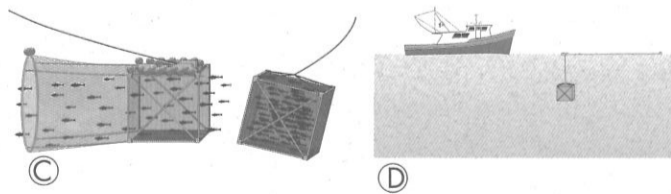
Full color diagrams can be found at www.afdf.org



(A) At any desired moment, the rear gate of the caging system was closed by activating the latch-release device through a third wire system from the wheelhouse.



(B) The front gate was closed using the third wire system after sufficient numbers of fish were observed inside of the cage.

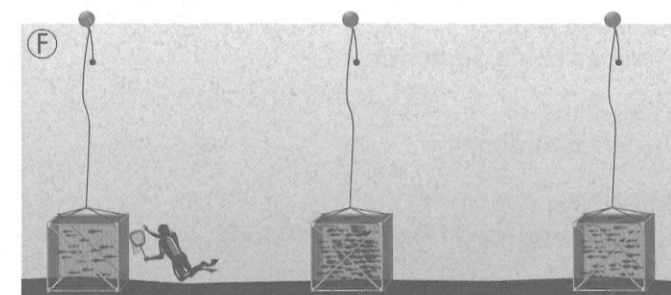


(C) The collection unit containing escapees was detached from the release unit.

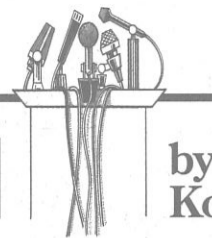
(D) The collection unit fell (or rose) to a depth of approximately 50 m.



(E) The collection unit was transported to the cage-staging site.



(F) Cages were attached to a groundline. Divers collected dead fish once or twice per day, and photographed fish in all cages.

by Jan
Konigsberg

Our Biological Permanent Fund

Before Prudhoe Bay, Bristol Bay was the darling of the economy. Now Alaska's wealth is no longer charted by cans packed, but by barrels shipped. These days in particular, Oil is prince and Fish is the pauper. Alaska's fisheries, especially salmon, are in trouble, yet sympathy and succor from the state's leadership seem in short supply. The state's political leaders seem unable and unwilling to steer a course through the maze of industry problems, apparently believing that the economic value of the industry is not sufficiently high to warrant greater attention. They do so at the state's peril.

Salmon management concerns led the drive to Alaska's statehood. By and large, statehood solved the problem of dwindling salmon stocks. Unfortunately, this seems to have been the last major fisheries problem the state has addressed. Solutions to other fisheries problems have proved elusive. Moreover, yesterday's "solutions," such as limited entry and hatcheries, have arguably become today's problems.

One reason fisheries problems are particularly difficult is that fish are literally commodities-on-the-run, imposing far more uncertainty than the other extractive industries face. Also, because the industry is such a fragmented collection of factional interests, it is not unified when it comes to proposing and advancing solutions in the political system. One faction's solution is often another's problem and politicians find themselves in the cross-fire, preferring to retreat rather than lead.

When Oil asks for relief, help is ordinarily regarded as an investment in the future, but when fishing is on the ropes, aid is characterized as welfare—a drain on the future. When the price per barrel of Alaska crude oil fell to its lowest ever (adjusted for inflation) several months ago, the legislative and executive branches flew into a tizzy, calling a special budget forum of state business leaders. A half-day was devoted entirely to the oil industry, whereas the seafood industry's sole representative was squeezed in at the end.

Nothing could be more topsy-turvy. Oil provides revenues, but the seafood industry provides the greatest number of private-sector jobs in the state—nearly 35,000 jobs. In many coastal communities, it is the major employer and often the only private-sector employment available. Oil is important, but oil will run out. Properly and conservatively managed, fish are Alaska's biological Permanent Fund (barring some unforeseen catastrophe to marine productivity caused by climate change).

Fisheries development is probably the most daunting of all economic development challenges facing Alaska into the next century. The future of much of rural Alaska will depend upon how we develop Alaska's fisheries. The challenge of fisheries development is two-pronged: sustaining fish populations and deriving the optimum economic value from Alaska's fisheries. Meeting this challenge will be a test of perseverance—refusing to regard problems as intractable—and creativity—refusing to be bound by traditional beliefs, poli-

cies, practices, and technologies. Alaska Fisheries Development Foundation plays an important role in meeting this challenge.

Historically, fisheries development has emphasized increasing harvest and utilization of fish stocks. Americanization of the Alaskan groundfish fishery would not have succeeded without the surimi manufacturing process pioneered by AFDF. But today, fisheries development must concern itself with creating greater value from stagnant and, in some cases, declining volumes of wild fish through product development and/or increased utilization of the harvested biomass (without ruling out capitalization to increase the volume of farmed seafood, where appropriate).

In the next millennium, fisheries development institutions will be judged by their success in sustaining marine productivity and optimizing fisheries production and value over time. Conservation must be one of the highest priorities. North Pacific fisheries development has the potential to be the nation's showcase. Because of the importance of Alaskan fisheries to the state and the nation, and the need to maintain the health and abundance of marine fisheries, AFDF is prepared to encourage and coordinate Alaskan fishing interests toward more substantive engagement in marine conservation matters. AFDF's demonstrated capacity for discerning, distilling, and presenting opportunities to industry during periods of transition will enable it to meet the current challenge.

Jan Konigsberg consults with AFDF on institutional development.

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*"Let us grow
accustomed to
seeing in the present
all of the past and
all of the future."*

—Juan Ramón Jiménez



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