SB

495

SENATOR FRED F. ZHAROFF
ALASKA STATE LEGISLATURE

P.O. BOX 405, KODIAK, ALASKA 99615 (907) 486-5259
DURING SESSION:
P.O. BOX V, JUNEAU, ALASKA 99811 • (907) 465-3473 • 465-3474

DISTRICT N
ALASKA PENINSULA • ALEUTIAN CHAIN • BRISTOL BAY • KODIAK ISLAND • LAKE CLARK/LAKE ILIAMNA • PRIBILOF ISLANDS • SHUMAGIN ISLANDS

MEMORANDUM

TO: Senator Paul Fischer
Chairman
Senate Health, Education and Social Services Committee

FROM: Senator Fred F. Zharoff

DATE: April 28, 1988

RE: CS For House Bill 495 - "An Act relating to fisheries education; and providing for an effective date."

I respectfully request that CSHB 495 be scheduled for a hearing at the committee's earliest convenience.

CSHB 495 would allow a school board to establish a fisheries education program in elementary, secondary, vocational and community schools in its district or regional educational attendance area. The program would include instruction related to the importance to the state of the commercial fishing and seafood processing industry, opportunities for jobs or careers in the industry, and skills relevant to employment in the industry. The Department of Education would develop and implement model fisheries education programs and instructional materials, and encourage and assist school districts in developing the programs.

The bill also would establish a Fisheries Education Fund in the Department of Education. This fund would consist of appropriations, federal funds, private grants, endowments, and contributions. In making grants from the fund, the department would consider programs that are designed to assist in the economic development of the attendance area served by the applicant, and give priority to programs in elementary and secondary schools. In addition, the department would be required to report to the governor and the legislature on a summary of its activities during the preceding calendar year.

Backup information for the bill is attached, as follows:

1. Department of Education fiscal note.

2. Letter of support from the University of Alaska Cooperative Extension Service.

3. Resolution supporting fisheries education from the Southwest Alaska Municipal Conference.

4. Letter of support from the Bristol Bay Borough School District.

5. Letter of support from Cordova Public Schools.

6. Brochure about Cordova Public Schools' Commercial Fisheries Apprenticeship Program.

7. Report on "Alaskan Youth Preparing for a Fishing Future in Alaska", Commercial Fisheries Apprenticeship Program, Cordova. The Cordova program is an example of the type of program that would benefit from CSHB 495 and that could be duplicated in other school districts.

8. "Renewable Natural Resources/Agriculture Curriculum" for secondary and postsecondary education, developed by the Department of Education.

9. Report on "Education and Training as a Solution to the Problem of Alaska Hire in the Alaska Seafood Industry", by A.W. Hall.

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: CSHB 495
PUBLISH DATE: _____

FISCAL NOTE

REQUEST: _____

Revision Date: _____
Title: . . fisheries education. . .

Agency Affected: Education
BRU: Adult and Vocational Education

Sponsor: House HESS
Requestor: sponsor

Components: Adult and Vocational Education Administration

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES		27.0	27.0	27.0	27.0	27.0
TRAVEL		7.0	7.0	7.0	7.0	7.0
CONTRACTUAL		10.3	10.3	10.3	10.3	10.3
SUPPLIES		.7	.7	.7	.7	.7
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	Ø	45.0	45.0	45.0	45.0	45.0
CAPITAL						
REVENUE						

FUNDING: (Thousands of Dollars)

GENERAL FUND		45.0	45.0	45.0	45.0	45.0
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS:

FULL-TIME						
PART-TIME		2	2	2	2	2
TEMPORARY						

ANALYSIS: (Attach a separate page if necessary)

See attached.

Prepared by: Karen Ryals
Phone: 465-2800
Division: Office of Adult and Vocational Education
Date: 3-21-88

Approved by Commissioner: William G. Demmert
Date: 3-21-88
Agency: Department of Education

Distribution (by preparer):
- Legislative Finance
- Legislative Sponsor
- Requestor
- Office of Management and Budget
- Impacted Agency(ies)

1.

Following is the proposed first year budget to provide leadership in implementing a grant program to develop a statewide fisheries curriculum, instructional materials, and model programs. Administrative services would include providing technical assistance, and preparation and dissemination of printed materials. The budget includes six months' personnel costs for a project assistant and quarter-time clerical support.

Line Item	Description	Amount
100	Personal Services	
	Project Assistant, .5 FTE, Range 16A	$20,000
	Clerk Typist III, .25 FTE, Range 8B	7,000
200	Travel	
	Technical assistance travel to five sites, one fisheries conference, and one economic development conference	7,000
300	Contractual Services	
	RFP advertising	800
	Printing of curriculum materials and reports	5,500
	Postage, mailings to districts, agencies	2,000
	Resource publications	500
	Telephone, long distance charges	1,500
400	Supplies	
	Stationery, desk supplies, folders, labels	700
	Total FY88 expenses	$45,000

COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF ALASKA, USDA & SEA GRANT COOPERATING

MARINE ADVISORY PROGRAM, PO BOX 10048, DILLINGHAM, ALASKA 99576

March 7, 1988

Rep. Adelheid Herrmann
Alaska State Legislature
Pouch V
Juneau, AK 99811

Dear Rep. Herrmann,

I am writing in support of HB 495 and HB 496, which support the development of fisheries education curriculum. I am commenting on behalf of the Marine Advisory Program, a subset of the School of Fisheries and Ocean Sciences at the University of Alaska Fairbanks. The region I serve includes Bristol Bay and the Alaska Peninsula/Aleutian Islands communities.

The lack of access to fisheries education has lately been a major topic of discussion in Southwest Alaska. The bottomfish boom in the Bering Sea has clearly indicated that right now, Alaskans are just not prepared to actively participate in this million dollar industry. Bristol Bay has the highest drain on high priced salmon permits leaving the region in the state, pointing out to residents that becoming a fisherman will not be an option for many local young people.

A recent meeting of the Southwest Alaska Municipal Conference focussed on the lack of access to fisheries classes and course materials within the region. A workshop at the 1987 Bristol Bay Fisheries Conference brought together educators from four school districts to assess needs for fisheries curriculum in the region. Only two of the four school districts in Bristol Bay offer any sort of fisheries classes. Many other communities are interested.

The limiting factor has been coordination and development of curriculum materials and training time for teachers who are unfamiliar with the industry. The Marine Advisory Program agents throughout the State have and are working with school districts to encourage this development. HB 495 and 496 are the tools needed to implement the programs.

Fisheries are the major source of private income in all of the coastal communities in the State. Local residents have the opportunity to become not just harvesters of the resource, but biologists processors, accountants and managers in the fishing industry of Alaska. It is vital that the State invest in this important contribution to our economy. Clearly the best way to do this is to present students with the range of opportunities and the route to get there.

Sincerely,

Paula Cullenberg
Marine Advisory Program

SOUTHWEST ALASKA
MUNICIPAL CONFERENCE
Box 89 • Unalaska • Alaska 99685

RESOLUTION 88-11

A RESOLUTION OF THE SOUTHWEST ALASKA MUNICIPAL CONFERENCE (SWAMC) SUPPORTING THE DEVELOPMENT OF FISHERIES AND SEAFOOD INDUSTRY EDUCATION AND TRAINING OPPORTUNITIES AT THE UNIVERSITY OF ALASKA.

WHEREAS, the commercial fishing industry is the largest private employer in the State of Alaska; and

WHEREAS, in the rural, coastal communities of Southwest Alaska the fishing industry is the only private source of employment; and

WHEREAS, these fisheries and the majority of the income and employment opportunities in the industry are currently held by urban Alaskans or non-State residents; and

WHEREAS, lack of trained, skilled local Alaskan residents is one of the major reasons cited by the industry in preventing local hire.

NOW, THEREFORE, BE IT RESOLVED that the SWAMC urges the University of Alaska to recognize its responsibility toward fisheries education and training in SW Alaska by:

- Designating fisheries training as a major segment of its vocational-technical program and funding;

- Establishing an industry advisory committee capable of assessing educational and training needs directly linked to employment possibilities;

- Working together through the School of Fisheries and Ocean Sciences and the Alaska Vocational Technical Institute to establish coordinated fisheries training.

NOW, BE IT FURTHER RESOLVED that the University of Alaska research and develop scholarship programs designed to allow rural Alaskans the opportunity to benefit from these training opportunities.

Phone (907) 581-1251, 581-1357

RECEIVED MAR 21 1988

BRISTOL BAY BOROUGH SCHOOL DISTRICT
P. O. BOX 169
NAKNEK, ALASKA 99633

PHONE 246-4225 OR 4265
HIGH SCHOOL

RICHARD W. LEATH
SUPERINTENDENT

*

March 10, 1988

Representative Adelheid Herrmann
Alaska State Legislature
P.O. Box V (MS 3100)
Juneau, Alaska 99811

Dear Representative Herrmann:

The staff and administration of the Bristol Bay Borough School District would like to voice their support for H.B. 495 and H.B. 496.

The economy of Bristol Bay is fish based and it is important that the school promote and educate in those areas that are important to the local people. We have just recently started development of more marine related courses and find it more important each year as the students consistently are faced with a more competitive fishery.

Passage of these two bills would provide a greater opportunity and flexibility for our district to devote more effort on the area of fishery curriculum development.

Sincerely,

Richard W. Leath
Superintendent of Schools

George T. Reynolds
School Board President

Larry Bradley
School Board Clerk

4.

CORDOVA PUBLIC SCHOOLS

BOX 140
CORDOVA, ALASKA 99574
PHONE: (907) 424-3265 OR 424-3292

March 14, 1988

Rept. Adelheid Herrmann
Alaska State Legislature
PO Box V
Juneau, AK 99811

Dear Rept. Herrmann:

I am glad to hear that you and Rept. Davidson are sponsoring House Bill No. 495 on Fisheries Education. The fisheries industry is one of the largest employers in the state, and it is appropriate to incorporate fisheries education in our schools.

A great majority of summer jobs and careers in Cordova are fishing related. This year the Cordova Public Schools, Prince William Sound Community College, and the Cordova Aquatic Marketing Association initiated a commercial fisheries vocational program which has every indication of success. Students and the community are enthusiastic. Plans to expand this initial effort to a solid three year training program are underway. Our program aims to help students gain experience and confidence in the fishing industry, plus provide a means for students to gain a limited entry permit by utilizing a portion of their wages as a down payment.

At the elementary school level, we incorporate fisheries concepts as part of our Sea Week program. Students and teachers decorate the school, go on field trips, listen to speakers, and utilize the sea and fishing in their classes.

Fisheries education has proven an excellent way to involve the community in our educational system. It provides a way for elder residents to pass on their knowledge to our young people, and to increase the interest of the young.

HB 495 and 496 will allow school districts to invest in the future by educating students to participate in one of our most important industries. The Cordova Commercial Fisheries Apprenticeship Program is preparing a slide/video production and some curriculum materials that we will be glad to share with other districts. The Cordova Public Schools supports HB 495-496. However, the $100,000 is just a beginning toward making Alaskan youth productive and safety conscious members of our fishing community. Dollar for dollar, the $100,000 will be returned by students able to contribute to Alaska's growth and development.

Thanks for your efforts.

Sincerely,

William Farrell, Supt.

5.

"Learning navigation is really interesting."

Neil Galosich
Junior

The Cordova Aquatic Marketing Association (CAMA) is a co-sponsor of the Commercial Fishing Apprenticeship Program along with the Cordova Public Schools. CAMA is an association of fishermen committed to the promotion of fish sales the sponsorship of CFAP and providin_ the fishing fleet with an insurance program.

CAMA assists the students in the CFAP with a Big Brother or Big Sister who answers questions and provides encouragement. CAMA helps match students and skippers for summer employment.

Commercial Fisheries Apprenticeship Program

Our goal is to better prepare students for jobs in the fishing industry by developing their confidence and skills in safety and survival, knots, anchoring, steering, nautical terminology, weather, navigation, electronics, rules and regulations and basic fisheries biology and management.

Students take classes at the high school and at Prince William Sound Community College. The classes in combination with the field trips prepare students to work in the fishing industry during the summers.

The program is open to Cordova Junior and Senior High School students and to members of the community who want to go back to school or to take individual classes.

Funds for the 1987/88 year's program are provided by the Alaska State Office of Adult and Vocational Education.

Belle Mickelson
Cordova Public Schools
P.O. Box 140
Cordova, Alaska 99574
907/424-3292

Fathom Graphics

Alaskan Youth Preparing for a Fishing Future in Alaska

Commercial Fisheries Apprenticeship Program

Cordova, Alaska

The Commercial Fisheries Apprenticeship Program (CFAP) is a three-year program designed to help students be better prepared to enter the fishing industry and get a limited entry fishing permit.

CFAP will help bolster Alaska's economy by keeping permits in the state and giving students outside of fishing families an opportunity to enter the fishing industry. Alaskan youth are preparing to fish in Alaska.

"I like the 'hands-on' approach to the class and the field trips. Because this class is small, we get a lot of individual attention from all our teachers."

Patty Hamelin
Sophomore

"I think it is a good class because it is giving us the opportunity to learn about fishing before we get jobs in the summer."

Teresa Werner
Senior

With the cost of fishing permits going up and entry into the fishing industry affected by experience as well as money, Cordova's Commercial Fishing Apprenticeship Program is meeting the problem head on with a curriculum and hands-on experience to prepare Alaskan youth for the future, their future in Alaska.

"I think the class is pretty neat because I'm learning how to be a fisherman. It's a lot easier to learn to tie a knot when someone is right there showing you."

David Glasen
Seventh Grader

State loans for fishing permits require three years of experience fishing as well as a down payment. CFAP will give students the experience necessary to obtain such a loan and help them save money for the down payment at the same time.

"CFAP is helping me learn a lot more about fishing so I'll be better prepared for a good job this summer."

David Sanders
Junior

Field trips are an important part of the instruction, allowing students to build their self-confidence in steering, anchoring, navigation, boat cookery, net mending and engine maintenance. The students learn first hand how to handle themselves on the water.

Alaskan Youth Preparing for a Fishing Future in Alaska

Commercial Fisheries
Apprenticeship Program
Cordova, Alaska

Patty Hamelin practices her steering skills on the Enchantress.

The Commercial Fishing Apprenticeship Program

by Belle Mickelson

Students in Cordova, Alaska are gearing up this year for a commercial fishing program. Cordova is a small commercial fishing town (pop. approximately 2500) on Alaska's southcentral coast. City officials recently became concerned because limited entry permits for the salmon gillnet and seine fisheries are leaving the community. So a committee was formed and a grant written to the state's Office of Adult and Vocational Education, jointly sponsored by the Cordova Aquatic Marketing Association (CAMA) and the Cordova Public Schools. The goal of this $63,800 grant is to give local students a chance to enter the fishing industry. It's a pilot program anxiously being watched by other coastal communities around the state of Alaska.

Recently, on an evening cruise on the *MIV Discovery*, a 65' charter boat, I asked students why they'd signed up for the program. "That's easy," they said, "jobs...money." They laughed.

And it's true. In Cordova in the summertime, netmending, cannery work, or a job as a crew member pays much, much more than babysitting. And yet many young people in Cordova, unless a parent has a fishing boat — just don't have a chance for these jobs. And even if they do get a summer job, it's just too expensive to think of getting their own boat and limited entry permit sometime in the near future. Some students are looking at the program as a way to get some training in marine biology, or to pay their way through college or vocational school. And after all, there's a lot of folks in Cordova with Master's and PhD degrees, who after years of schooling and other jobs, decided they'd just rather "be fishing."

The Commercial Fisheries Apprenticeship Program is designed to better prepare students for these fishing jobs. It's being set up as a three year program — though some students may want to take longer. Here are the basic components:

16-year-old Gwynn Thomas at the wheel of a Cordova gillnetter. Photo by Brian Trani, Cordova High School senior.

1. Students will take a variety of courses at the high school and community college during the school year. Many topics will be integrated into regular high school classes such as welding; (building aluminum skiffs); power mechanics (inboard/outboard motors); marine biology; vocational math (navigation); home economics (boat cookery); science (fisheries biology, oceanography, weather, wetlands); physical education (safety and survival); health (boat living); personal finances (break even analysis/income

Commercial Fisheries Program (continued)

taxes/loans/insurance); social studies (fishing issues, pollution, Coast Guard regulations); and journalism (marketing). Seamanship/fisheries is the only new course we are considering teaching at the high school. Other courses will be taught at the college such as netmending, aquaculture, electronics, diesel mechanics, fiberglas repair, seafood processing, refrigeration and fish quality, and scuba diving.

2. Each student will be assisted by a CAMA big brother or sister who will check in with students weekly throughout the year — showing students their own boats and engines, answering questions and providing encouragement.

3. Students will work on fishing vessels during the summer. A CAMA screening committee will match students and skippers.

4. A portion of the students' earnings will be set aside in a trust fund — earmarked for each student. Upon successful completion of the program requirements (coursework and crew experience), students will meet the State's requirements for eligibility to apply for low interest financing to obtain a Limited Entry Permit, vessel and gear — and these trust funds can be used for this purpose.

Field trip monies in the grant will give students numerous opportunities to go out on boats and build their self-confidence in steering, anchoring, navigation, and engine maintenance. Students have really enjoyed the two boat trips last month. The orca whales were so close we could hear them blowing. Students sampled the waters with secchi disk, van dorn bottle, sounding line, dredge, and plankton tow. They spent time in the wheelhouse learning about electronics and navigation. They also recorded weather and events in their own logbooks.

This month we're planning an overnight boat trip and an evening meeting where students can invite their parents down to the CAMA office to meet local fishers, and discuss future plans.

GED students and other members of the community who would like to go back to school are being invited to enter the program.

As program director, I'll be putting together a curriculum guide and report on the program, so contact me if you'd like to get a copy. Marilyn Leland, administrative assistant for the program, is working on insurance questions about students and boats and field trips. We're very open to suggestions and would also like to hear about other boat-oriented programs. Contact us by writing Belle Mickelson, Cordova Public Schools, Box 140, Cordova, AK 99574 or phone (907) 424-3292 (Belle) or 424-3447 (Marilyn).

Is your classroom or school involved in a project in environmental education like these that you would like to share with readers of Clearing?

Help Clearing share ideas and success stories from around the Pacific Northwest. Send your article, accompanied by black-and-white photos, to Clearing, c/o Environmental Education Project, School of Education, P.O. Box 751, Portland, OR 97207 or call us at (503) 229-4721 to discuss your idea.

Reprinted from

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environmental education
in the pacific northwest

a publication of the
Environmental Education Project of
Portland State University
Portland, Oregon

Issue No. 51
November/December 1987

THE COMMERCIAL FISHERIES APPRENTICESHIP PROGRAM

October 5, 1987

The Commercial Fisheries Apprenticeship Program is designed to help students be better prepared to enter the fishing industry--and get a limited entry permit. The program is being set up right now as a 3-year program--though some students may want to take longer. Cordova Aquatic Marketing Association (CAMA) is working with the Cordova Public Schools and the City of Cordova in this effort. Here are the basic components:

1. Students will take a variety of courses at the high school and college during the school year.

2. Students will work on fishing vessels during the summer. A CAMA screening committee will match students and skippers.

3. A portion of the students' earnings will be set aside in a trust fund--earmarked for each student. Upon successful completion of the program requirements (coursework and crew experience), students will meet the State's requirements for eligibility to apply for low interest financing to obtain a Limited Entry Permit, vessel and gear--and these trust funds can be used for this purpose.

4. Each student will be assisted by a CAMA big brother or big sister who will help them with their program. In addition, the Project Director, Belle Mickelson, and Administrative Assistant, Marilyn Leland, and all the teachers and instructors will be working with the students.

The Commercial Fisheries Apprenticeship Program is designed for success. Students will have numerous opportunities to go out on boats, try out survival gear in the pool, work on engines, design and build boats, practice boat cookery as well as learning about fisheries and marine biology, weather, Coast Guard rules and regulations, personal finance, boat loans and insurance. Important concepts will be repeated and integrated to ensure success.

If you would like to participate in the program, please fill out the following form and return to Belle Mickelson, 424-3292, Supt. Office, Box 140, Cordova, AK 99574 or Marilyn Leland 424-3559, CAMA, Box 359, Cordova, AK 99574.

NAME_____

ADDRESS_____

PHONE_____ GRADE_____

☐ I would be available to take a Seamanship/Fisheries class next semester:

_____ During the school day
_____ After school
_____ Evenings

☐ I can't sign up for the full program right now, but I'm interested in taking some of the courses.

☐ I am interested in fisheries because_____

_____

COMMERCIAL FISHERIES APPRENTICESHIP PROGRAM CURRICULUM

Courses at the High School

Welding (building aluminum skiffs)	John Goodrich
Power Mechanics (inboard/outboard motors)	Tom Trani
Marine Biology	Roger Trani
Vocational Math (navigation)	Don Morgan
Home Economics II (boat cookery)	Veronica Dunn
Science (grades 7-10 fisheries oiology, introduction to ocean life, geological and physical oceanography, weather and wetlands)	Tom Trani & Jim Casement
Physical Education (9th grade safety and survival)	Sharon McHone, Virginia Anderson & Jim Casement with help of Rick Steiner, Alaska Seagrant
Health (boat living)	Jim Casement
Personal Finances (Break even Analysis/ Income Taxes/Loans/Insurance)	Brian O'Leary
Social Studies (fishing issues including pollution, Coast Guard regulations)	Tom Church & Brian O'Leary
Office Practices II (marketing)	Susan Harding

Courses at the College

Courses may be taught at the high school--one course/semester depending on student interest--but most will probably be taught as short courses after school or on weekends over a three-year period. Tuition will be paid for students registered in the program.

Seamanship (Boat handling, anchoring, rigging, fueling, etc.)
Net Hanging and Construction
Overview of Commercial Fisheries (processing, gear types, stocks, fishing strategies)
Aquaculture
Electronics
Diesel Mechanics/Maintenance
Fiberglas Repair
Hydraulic Systems
Seafood Processing, Refrigeration & Fish Quality
Scuba Diving

All classes will involve numerous field trips, community speakers from the fishing industry and actual work experience. Students will select courses that interest them and are of value to their fisheries interests.

The program is also open to members of the community who may want to go back to school or take individual classes.

The Commercial Fishing

Apprenticeship Program

will help keep

ownership of permits

in Alaska

This will bolster our economy!

Project Director Belle Mickleson and CFAP students David Sanders, Teresa Werner, David Glasen, Marcos Vogelpohl, Neil Galosich, (back row) Jim Bass, Andy Billings, Patty Hamelin, Josh Billings, Roger Havens and Jerry LeMasters get ready for another field trip.

It takes three years of

experience on a fishing vessel

and

a down payment

to qualify for

a State Loan

You can only purchase a permit

with a State Loan or a CFAB loan.

In 1988

the cost of permits

is approximately

$80,000 for a gillnet

$110,000 for a seine

and

$30,000 for a set net

CFAP students David Glasen and Julie Quales check items for their survival kit when aboard a fishing vessel.

The Commercial Fishing

Apprenticeship Program

trains Alaskan Youth

in

welding, power mechanics,

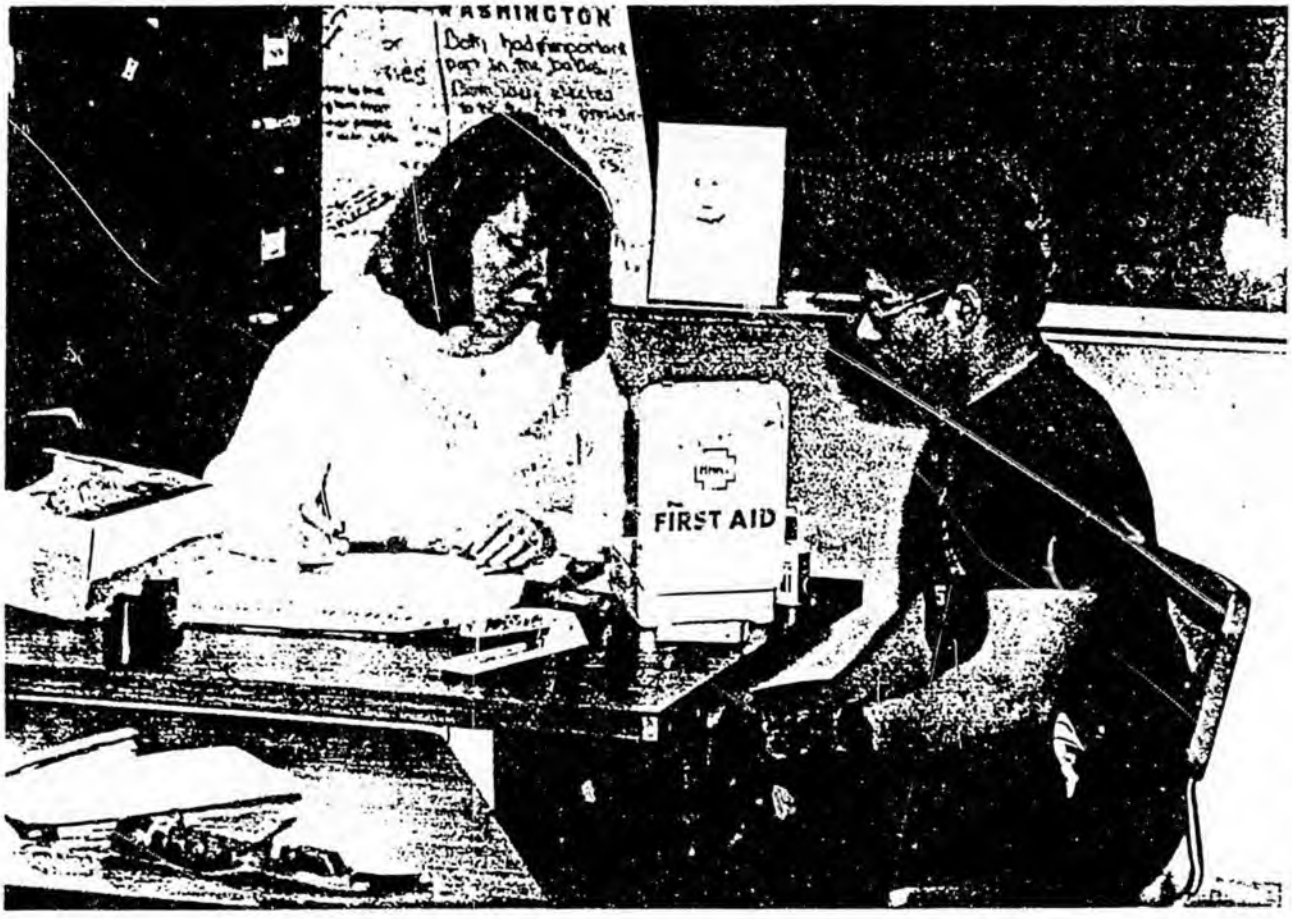
biology, navigation, cookery,

safety and survival,

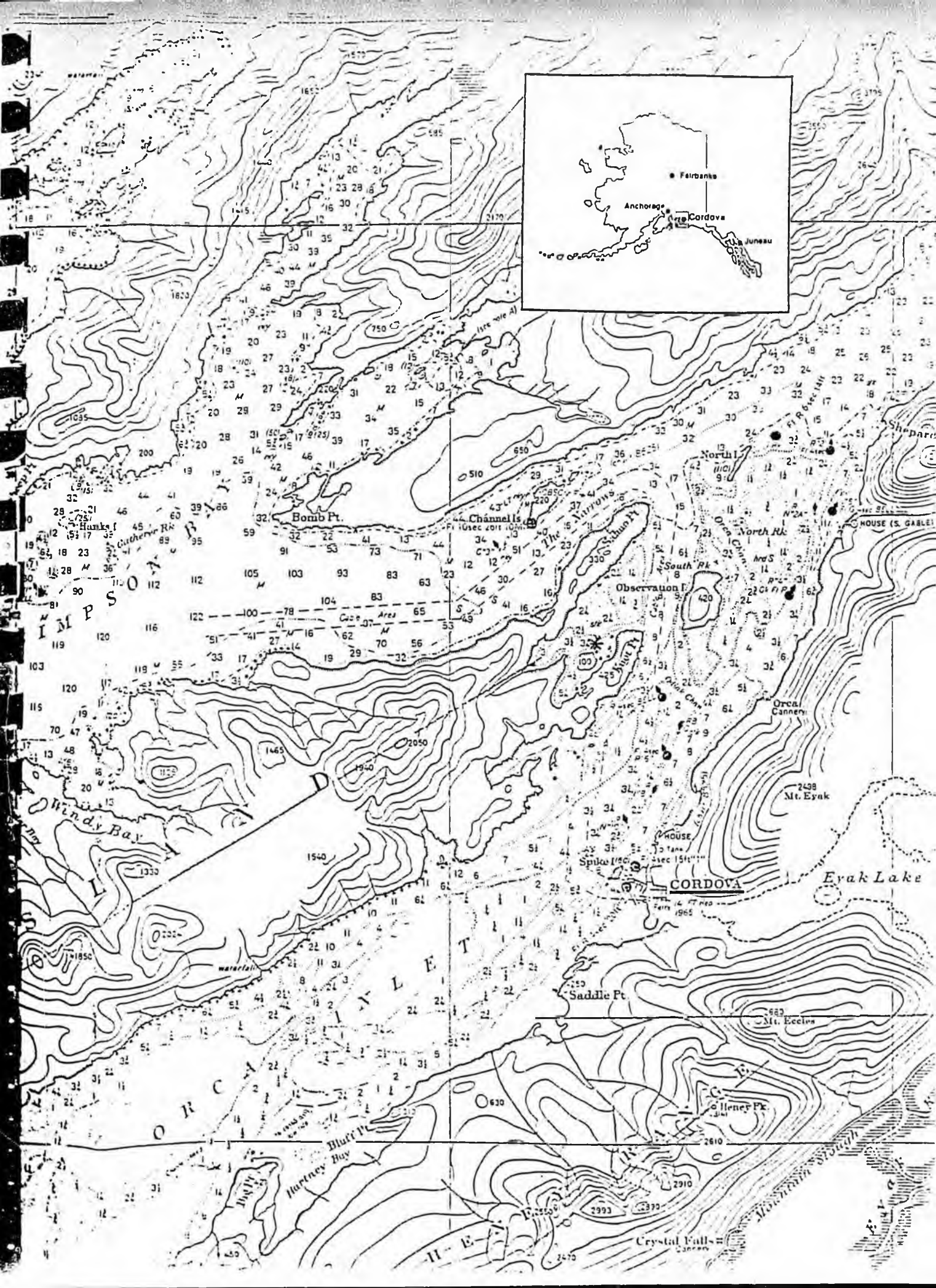
taxes and loans,

and

marketing



CFAP student Roger Havens with CAMA Adminstrative Assistant Marilyn Leland go over the necessary first aid equipment for a fishing vessel.


Fairbanks
Anchorage
Cordova
Juneau
Bomb Pt.
Channel Is.
The Narrows
Observation I.
North I.
North Rk.
South Rk.
Hunks I.
Gutchemir Rk.
Orca Channel
Orca Cannery
Mt. Eyak
CORDOVA
Eyak Lake
Spike I.
Saddle Pt.
Mt. Eccles
Windy Bay
Hartney Bay
Bluff Pt.
Crystal Falls
Mountain Slough
IMPSON
ORCA
WILLE

PRINCE WILLIAM SOUND

COMMUNITY COLLEGE

COPPER BASIN - CORDOVA - VALDEZ

ALASKA

COURSE OUTLINE
for
COURSE APPROVAL

Course Title: Fishing and Fisheries I
Credits: 3
Prerequisites: Interest in fishing as a career

Date: January 12
Course Outline
Developed by:
Belle Mickelson

Course Objectives: To better prepare students for jobs in the fishing industry by developing their confidence and skills in safety and survival, knotting, anchoring, steering, terminology, weather, navigation, electronics, rules and regulations and basic fisheries biology and management.

Course Content By Topics: (Topic Outline) The course will include an overview of the fishing industry, safety and survival, fish and fisheries--plus textbook and actual experience with nautical terminology, knots, seamanship, marine engines, weather, navigation, electronics, vessel requirements and an introduction to rules of the road.

Readings (Students):

Text:

Additional Readings:

Text/Materials (title, author date of publication, etc.): Boating Skills & Seamanship, U.S. Coast Guard Auxiliary; The North Pacific Deck Hand & Alaska Cannery Workers Handbook, Abacore Press; Fisheries of the North Pacific, R.T. Browning, Safety Notes for the North Pacific Fisherman, University of Alaska Sea Grant.

Teaching Method: Lecture, labs and field trips where students have a chance to practice what they're learning.

Requirements and Grading: Logbook of boat time; attendance; weekly quizzes; final exam and practicum.

Course Schedule: January 26-April 29 · riday 7:45-8:40 a.m.; field trips equivalent to 3 additional hours/week late ... d weekends.

Marine Technology 194

JANUARY 1988

SUNDAY		WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
24 / 31	25	27	28	29	30

25 — COURSE 6 BEGINS

27 — Unit 1 — The Fishing Industry

28 — 29 — Safety and

FEBRUARY 1988

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2	3	4	5	6
7	8	9	10	11	12 (Lincoln's Birthday)	13
14 (Valentine's Day)	15 (Washington's Birthday observed. BANK HOLIDAY)	16	17 (Ash Wednesday)	18	19	20
21	22	23	24	25	26	27
28	29					

3 — Survival Unit 2

9 — 10 — 11 — Marlinspike Unit 3 — 12

15 — 16 — Seamanship — 17 — 18 — Nautical Terminology Unit 4 — 19

24 — Vessel Requirements Right of Way Unit 5

Jigging sticks and lures were used by Eskimos to fish through the sea ice in early spring for tomcod and sculpin. The hooks and even the sinkers were brightly colored to attract the fish, which once caught, were brought to the surface with the aid of a second stick to pull the line. This type of fishing was often very productive, and frequently was done by old people, women and children.

MARCH 1988

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2 Seamanship Unit 6	3	4	5
6	7	8	9 Seamanship (con't)	10	11	12
13	14 NET MENDING 7-9pm Ninilchik High School	15	16 Fish & Fisheries Unit 7	17 St. Patrick's Day	18	19
20	21	22	23 SPRING BREAK Marine Trade Fair	24	25	26
27 Palm Sunday	28 MARINE ENGINES 4-6pm Cordova Outboard	29 7-9pm Cordova Outboard	30 Fish & Fisheries (con't)	31		

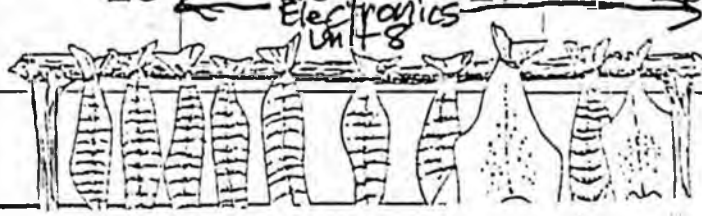
consumption by the people ... larger villages, sell their ca...

Lures were lowered in shallow water then jigged about to attract larger fish, which were then caught with spears barbed to hold them. Lures usually were carved to resemble fish, and often were decorated ...

First National Bank

APRIL 1988

WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1 Good Friday	2 Passover
3 Easter Sunday	4 SPLICING 7-9pm	5 Fish & Fisheries (con't)	6	7	8	9
10	11	12 Weather (Unit 8)	13	14 Navigation (Unit 8)	15	16
17	18	19 Coast Guard Review Session	20 Coast Guard Boating Test & Safety	21 Navigation (con't)	22	23
24	25	26 Electronics Unit 8	27	28	Fisheries & Navigation/ Electronics Exam	30



First National Bank of Anchorage

FISHING AND FISHERIES I

Unit 1. The Fishing Industry — 1/2 week

Competency: Identify employment in fishing and fisheries

Tasks: Identify educational and occupational opportunities

Locate resources for finding employment
Confer with prospective employers
Identify work in:

a. fisheries enhancement
b. hatcheries
c. commercial fishing
d. canneries
e. cold storages
f. factory trawlers
g. equipment and facility maintenance
h. fish and game biology
i. fish and wildlife protection
j. sports fishing
k. fisheries laboratories

Resources: Local skippers and The North Pacific Deckhands & Alaska Cannery Workers Handbook.

Competency: Identify the economic importance of fishing to Alaska

Tasks: Identify the relative dollar value of the Alaskan fishing industry to the state

Point out locations of major Alaskan fisheries and fishing ports on a map

Identify potential expansion in the fishing industry, including:

a. Salmon farms
b. Oyster farms
c. Other shellfish and finfish mariculture developments
d. Bottom fishery

Discuss the importance of marketing fisheries resources to the viability of Alaska's fishing industry
Identify the importance of seafood in the life and economy of Alaska
Contrast methods, vessels and gear involved in the Alaska commercial fisheries
Explain how fisheries managers attempt to regulate the fisheries to the mutual benefit of the resource and the fisherman
Compare and contrast the following fisheries:

a. salmon
b. halibut
c. herring
d. king crab and tanner crab
e. bottom fish
f. shrimp and other invertebrates
g. shellfish

Identify different species within each fishery
Identify economic rises and falls for each fishery

Unit 2. Safety and Survival — 2 weeks

Competency: Practice personal safety and accident prevention

Tasks: Prepare for vessel emergencies

Explain emergency procedures for: fire, collisions, capsize, foundering, man-overboard and personal injuries:

a. Alert crew
b. Issue personal flotation and immersion protection devices
c. Administer first aid to prevent shock and control bleeding
d. Administer CPR
e. Don survival suit; describe other PFDs
f. Launch and operate lifeboat and life raft
g. Close emergency fuel shutoff valves
h. Extinguish Class "C" fire; learn about fire extinguishers
i. Act as lookout to keep person in sight who has been lost overboard
j. Secure engine room to prevent spread of fire
k. Send out distress signals
l. Use of IPERBs
m. Sound abandon-ship alarm, if necessary

Describe accident prevention measures on boats & in the harbor
Practice cold-water survival skills
Treat victims for hypothermia
Practice first aid
Prepare for helicopter rescue
Practice liferaft survival
Practice survival suit survival
Practice shore survival techniques
Identify sources of water and food in a wilderness setting

Unit 3. Marlinspike Seamanship — 1 week

Competency: Practice proper use of knots and lines

Tasks: Describe the types and structure of line/rope

a. Laid line
   1. Left hand laid
   2. Right hand laid
b. Braided line
   1. Hollow
   2. Core

Identify the following types of rope & compare & contrast the uses for each

a. Manila
b. Nylon
c. Dacron
d. Polypropylene
e. Cotton

Demonstrate whipping

Identify the following knot parts

a. Standing part
b. Bight
c. Turn
d. Round turn
e. Bitter end

Tie each of the following knots:

a. Overhand
b. Figure-eight knot
c. Two half-hitch
d. Square knot
e. Clove hitch
f. Anchor bend
g. Sheet bend
h. Double beckets
i. Bowline
j. Timber hitch

Demonstrate the following splices:

a. Short splice
b. Eye splice

Coil and throw line

Utilize blocks and tackle

a. Block structure
b. Mechanical advantage

Unit 4 Nautical Terminology — 1/2 week

Competency: Use the proper vessel terminology at sea and in port

Tasks: The student will demonstrate the ability to locate or identify on a vessel or a picture the following vessel locations:

a. Port
b. Starboard
c. Aft
d. Bow
e. Amidships
f. Below
g. Overhead
h. Forecastle
i. Deck
j. Topside
k. Bilge
l. Waterline
m. Stern
n. Rubrail

The student will demonstrate the ability to use the following terms to describe a location outboard from a vessel.

a. Dead ahead
b. Starboard bow
c. Abeam, starboard beam
d. Starboard quarter
e. Aft, astern
f. Port quarter
g. Port beam
h. Port bow

The student will demonstrate the ability to identify the following dock types.

a. Dock
b. Wharf
c. Pier
d. Finger Pier
e. Slip
f. Mooring

The student will demonstrate the ability to identify the following harbor structure explain their usage.

a. Dolphin
b. Piling(s)
c. Jetty
d. Breakwater

The student will demonstrate the ability to explain the function and operation o following vessel repair facilities.

a. Dry dock
b. Grid
c. Cradle
d. Travel hoist

The student will demonstrate the ability to identify , describe, sketch and use the fo ing vessel hardware.

a. Davits
b. Cleat
c. Bitts
d. Chock
e. Hawse pipe
f. Thimble
g. Shackle
h. Stays, booms, etc.

The student will demonstrate the ability to identify and locate the following terms vessel or a drawing of a vessel.

a. Keel
b. Transom
c. Stem
d. Bilge
e. Waterline
f. Freeboard
g. Draft
h. Stringers
i. Gunwale
j. Ribs or frames

The student will demonstrate the ability to identify and describe the purpose of th lowing vessel features.

a. Bridge
b. Pilot house
c. Chainlocker
d. Port (not a direction)
e. Hatch
f. Cockpit
g. Coaming
h. Scuppers
i. Bulkheads
j. Watertight bulkheads
k. Hold
l. Bulwark
m. Galley
n. Head
o. Mast
p. Sheer

The student will demonstrate the ability to define the following terms and other ter directed by the instructor.

a. Stow
b. Make fast
c. Haul out
d. Cradle
e. Painter
f. Toe rail
g. Ship-shape
h. Swabs
i. Gangway
j. Ground tackle
k. Athwartships
l. Windlass
m. Boom
n. Topping lift
o. Helm
p. Scuttlebutt

Unit 5. Vessel Requirements/Right of Way — 1 week

Competency: Locate and identify requirements for vessel operations

Tasks: Demonstrate the ability to locate and identify the requirements for commercial vessel operation as follows:

a. Motorboat
b. Motor vessel
c. Navigation lights and shapes
d. Backfire flame control
e. Special operating requirements
f. Boarding
g. Work vest
h. Crew requirements

Describe reasons for carrying the following optional equipment:

a. Anchors
b. Bilge pumps
c. Extra line
d. Charts
e. Flashlight

Competency: Use the rules of the road

Tasks: Identify marine vessel boundaries
Identify terms and definitions related to marine charts and rules of the road
Use steering and sailing rules including:

a. Rules when approaching sailing vessels
b. Rules for vessels meeting, nearing a bend, leaving berth
c. Rules for passing a vessel head on
d. Rules for vessel meeting, nearing a bend, leaving berth
e. Rules for passing a vessel head on
d. Rules for overtaking a vessel
e. General prudential rule

Identify special situation lighting and signals
Plot a course on a chart and convert true bearings to compass bearings
Identify day markers and fog signals
Identify distress signals

Competency: Use marine lights and sound signals

Tasks: Explain when marine lights are needed
Identify rules for the following situations

a. steam vessel underway
b. steam vessel towing and pushing
c. sailing vessel and vessels in tow
d. small vessels
e. pilot vessels
f. fishing vessels
g. stern lights
h. anchor lights
i. signals to attract attention

Sound signals for the following situations:

a. steam vessels underway
b. sailing vessels underway
c. vessels at anchor
d. vessels towing or being towed
e. speed in fog

Unit 6. Seamanship/Marine Engines — 3 weeks

Competency: Use a tide book, nautical charts, and coast pilot

Tasks: Determine heights & times of high and low tides for a given location
Explain how to estimate tide height at any time
Use the "Rule of Twelve" to determine tide level at any point in tidal cycle
Identify symbols used on nautical charts
Plot and find directions and distances on a chart
Read current tables

Competency: Get a vessel underway

Tasks: Develop and follow a check list for getting underway
Engage bilge and engine room blower and bilge pumps
Maintain proper level of coolant in expansion tank
Determine if all navigation lights are functioning
Tighten engine mounts
Inspect fire-fighting equipment for wear, location and type
Secure deck equipment, lashings, hausers, or mooring lines
Inspect personal flotation devices for number, fit, integrity and location
Inspect survival suits for number, fit, integrity, location and type
Inspect vessel for fuel leakage
Prepare list of equipment to be checked for oil leakage
Secure watertight doors, hatches, vents, and skylights
Bleed air compressor of water
Check and maintain batteries
Determine fuel levels
Inspect water level indicators for cleanliness
Test radio equipment
Inspect antennas
Determine if hydraulic steering equipment is free of air and water
Determine that rudder stuffing box is functioning properly
Tighten propeller stuffing box
Determine if proper voltage is being generated
File a float plan

Competency: Maneuver a vessel

Tasks: Obtain and explain a current weather forecast
Observe the rules of the road
Follow safe boating practices
Maintain adequate safety margins in regards to weather and sea conditions
Handle vessel in a variety of sea conditions while underway
Handle vessel in a variety of sea conditions while actively fishing

Competency: Anchor vessel

Tasks: Maneuver vessel to anchorage
Anchor vessel by using anchor winch or windlass
Secure anchor on bottom
Retrieve and secure anchor and stack (tier) anchor chain in locker

Competency: Dock a vessel

Tasks: Assign tasks and stations for vessel mooring
Maneuver to dock
Secure mooring lines to dock and/or other vessels
Secure engine room and secure propeller shaft
Release towing gear

Competency: Conduct deckhand duties

Tasks: Wear proper clothing for duties
Hand or hoist equipment and supplies aboard
Cast vessel off
Coil lines
Work riggings such as nets, slings, hooks, cables, booms, and hoists
Stand lookout, steering, and engine room watches
Operate dories, dinghies, and skiffs
Attach accessories, such as floats, weights, and markers to nets and lines
Pull and guide nets and lines onto vessel
Wash deck, conveyors, knives and other equipment, using brush, detergent and water
Wash and clean RSW tank and chill system with chlorine or iodide
Lubricate, adjust, and maintain engines and equipment

Competency: Conduct basic inboard & outboard engine troubleshooting

Tasks: Put together a tool box with spare parts and tools
Do a routine engine check before leaving dock
Identify engine parts and describe their function
Identify causes of outboard and inboard engine problems
Perform pre-season and post-season routine maintenance on outboard and inboard engines

Unit 7. Fish & Fisheries

3 w

Competency: Identify Alaska's water resources

Tasks: Discuss the origins of the oceans
Examine the geology of Alaska's sea bottom
Point out major tidal areas in Alaska
Discuss possible effects of water pollution on Alaska's water resources

Competency: Understand basic fish biology

Tasks: Explain basic salmon development: from egg to adult fish
Explain basic salmon anatomy
Discuss basic salmon migration patterns and behavior

Competency: Identify attributes of Alaska's commercial fish species

Tasks: Identify attributes of salmonids including:
a. External anatomy
b. Internal anatomy
c. Classification
d. Distinguishing characteristics
e. Life histories including:
1. Embryology
2. Life history stages
Use plankton net in studying microscopic water life
Use hand dredge for examination of bottom samples
Use seines for identification of small forage fish
Identify Alaska's underutilized marine resources

Competency: Identify the life cycles of Pacific salmon

Tasks: Explain the hatching process of salmon
Explain the life process fo salmon fry
Explain the life processes of adult salmon
Explain the reproductive phase of salmon
Explain the importance of dead salmon to stream replenishment
Discuss the issue of man-made hindrances to salmon reproduction

Competency: Net Fish

Tasks: Explain principles and techniques associated with various net fisheries
Locate quarry using equipment available
Operate and maintain net fishing equipment such as dip, diver, gill, hoop, la
pound, trap, reef, trammel, and travel nets
Operate and maintain seine equipment such as purse seine, haul, drag c
seine and power skiffs
Insert and attach hoops, rods, poles, ropes, floats, weights, beam runners, ot
boards, and cables to form, reinforce, position, set, tow, and anchor
required

Tow net to location and anchor in place
Attach appropriate flags and lights to buoys to mark and identify nets
Haul net with appropriate gear
Remove catch using appropriate techniques and equipment such as dip net, brail buckets, hydraulic pumps, conveyor, lifting net, blocks, tackles, and dumping catches
Clean, store and transfer catch appropriately
Sort and clean fish, throwing undesirable and illegal catch overboard
Stow catch in hold or transfer to tender
Repair fishing nets and gear
Investigate costs of net repair machine
Complete minor repairs to engines and equipment
Wash deck and equipment

Competency: Identify the importance of improving fish quality

Tasks: Explain the importance of improving fish quality
Identify whom improving fish quality benefits
Identify methods for improving fish quality including:
a. intrinsic quality
b. extrinsic quality
Explain ways fish quality is lost including:
a. bacterial decomposition
b. enzymatic breakdown
c. chemical changes
d. physical damage
e. dehydration
f. contamination

Competency: Handle fish correctly aboard the vessel

Tasks: Explain the importance of good handling practices
Relate catching rates to correct fish handling
Correctly bleed and gut fish
Wash fish
Store fish on the vessel
Unload fish from vessel
Identify whom improving fish quality benefits
Compare prices for fish "in the round", "roll dressed, "J" cut, princess dress, western dressed

Competency: Practice vessel sanitation

Tasks: Explain the importance of vessel and product sanitation
Use sanitation tools
Use chemical sanitizers
Sanitize refrigeration equipment
Identify potential sanitation problems

Competency: Store fish aboard the fishing vessel

Tasks: Explain the importance of chilling seafood
Identify ways to store fish without refrigeration
Ice fish
Store fish with chilled sea water
Store fish with refrigerated sea water
Freeze fish at sea

Competency: Understand the important state and federal regulations and regulator agencies pertaining to fisheries

Tasks: Identify the role of the Board of Fisheries
Identify the role of fishery advisory committees
Explain the role of the International Halibut Commission
Explain the role of the Alaska Department of Fish and Game
Explain the role of the Alaska Division of Fish and Wildlife Protection
Explain the regulatory role of the U.S. Coast Guard
Identify rules pertaining to catch and size for local fishery

Competency: Understand fish management practices

Tasks: Assess fish stock
Discuss ideas of sustained yield fishery
Identify the consequences of fishery over-exploitation
Discuss the future of local and statewide fisheries
Trap and strip fish
Maintain rear ponds
Stock lakes and streams
Rehabilitate waters
Explain how to rescue fish
Survey fish
Remove rough fish
Improve spawn areas
Discuss enforcement of proper fishing harvest laws
Discuss of management by Cordova office of ADF&G

Competency: Manage salmon

Tasks: Identify agencies involved in management of Alaska's salmon
Explain different methods for assessing the fishery
Identify the goals of salmon management

Resources: James Brady and Sam Sharr, Alaska Department of Fish & Game; Suzumoto, Prince William Sound Aquaculture Corporation

Unit 8. Weather/Navigation/Electronics — 2 weeks

Competency: Describe local weather patterns

Tasks: Identify local weather stations & reports
- Explain current barometer readings
- Describe cloud patterns
  - a. Cirrus
  - b. Alto
  - c. Stratus
  - d. Cumulus
  - e. Nimbo
- Measure wind direction and speed
- Characterize storm warnings
- Describe typical weather patterns in Prince William Sound

Competency: Read navigational charts

Tasks: Describe magnetic variation and deviation
- Explain compass compensation
  - a. Electrical problems
  - b. Internal adjustments
  - c. External adjustments
- Practice reading gyro-compass headings
- List sources of nautical charts
- Explain latitude and longitude
  - a. Original of navigational grid
  - b. Rough determination of positions
  - c. Identifying and finding positions
- Read chart symbols
  - a. Symbols of man-made shore structures
  - b. Symbols of natural shore features
  - c. Bathymetry and bottom features
  - d. Hazard symbols
  - e. Symbols of navigational aids
- Pilot using dead reckoning, using time, distance and speed
- Use various forms of running fixes including:
  - a. 45-90
  - b. 22 1/2-45
  - c. 26 1/2-45
- Pilot using a cross bearing
- Use navigational aids, tide and current charts and equipment

Competency: Use modern electronic systems

Tasks: Use echosounders and depthfinders, including:
- a. Differentiating among types
- b. Interpreting signals

Use Radio Direction Finders (RDF), including:

a. Identifying range of equipment available
b. Installing loop antenna
c. Using RDF aboard small craft
d. Identify marine radio beacon stations and systems
e. Plotting radio bearing and finding position with RDF

Use radar including:

a. Installing, identifying components of, and operating radar
b. Using radar as a navigational aid
c. Interpreting radar signals
d. Piloting using radar
e. Monitoring radar beacons (RACON)
f. Identifying radiation hazards
g. Installing and using radar reflectors

Use Loran C or Omega including:

a. Explaining hyperbolic navigation systems
b. Differentiating among groundwaves and skywaves
c. Characterizing Loran C and Omega receivers
d. Navigating with Loran C

Use Sonar

a. Installing, identifying components of and operating Sonar
b. Interpreting Sonar signals
c. Navigating and finding fish with Sonar

Commerical Fisheries Apprenticeship Program students on a recent field trip aboard the United States Coast Guard Cutter Sweetbrier, stationed in Cordova, Alaska.

Students observed navigational aides being serviced as well as navigation, steering, and other skills.

At an Open House held Nov. 19, Bob and Nell Galosich talk with program coordinator Belle Mickelson about the Fisheries Apprenticeship Program. (Cordova Times)

Courses stress safety, seamanship

By Rebecca Horn

With an eye toward summer employment for high school students and a goal of increasing the number of locally-owned limited entry permits, the Cordova Fisheries Apprenticeship Program will begin offering classes in January at the high school.

Program director Belle Mickelson described the project as a three-part program. "For any program to go well it has to be well-rounded. The apprenticeship program will have a good course where students are drilled on safety and seamanship, a big brother/big sister aspect, and summer employment on local fishing crews," said Mickelson.

"We're also designing courses at the college level to offer to the community to round out the program."

"We hope local fishing people will get involved in one of two ways," Mickelson said. "Either

See APPRENTICE, p. A-6

APPRENTICE *from p. A-5*

as big brothers or big sisters to students, or by hiring students on their crews for the summer."

She added that because of the hectic pace of the summer season, the big brother/big sister part of the program would occur more during the winter. "We'd like the big brother or sister to take their students down to their boat if they have some engine work to do, or some painting. Most just talk fishing."

The big brother or sister is not encouraged to hire their students for their summer crews. "We want this to build into a support network for the student, so they have another adult to talk things over."

The most unusual aspect of the program is the potential for students to buy their limited entry permits after completion of the course curriculum. "We're suggesting that students put back half of their summer's salary into a trust fund," Mickelson explained.

"At the end of a three-year program, they'll be able to approach the state with a substantial amount of money and three years experience and training. We think this is just an incredible opportunity for students coming out of high school," said Mickelson.

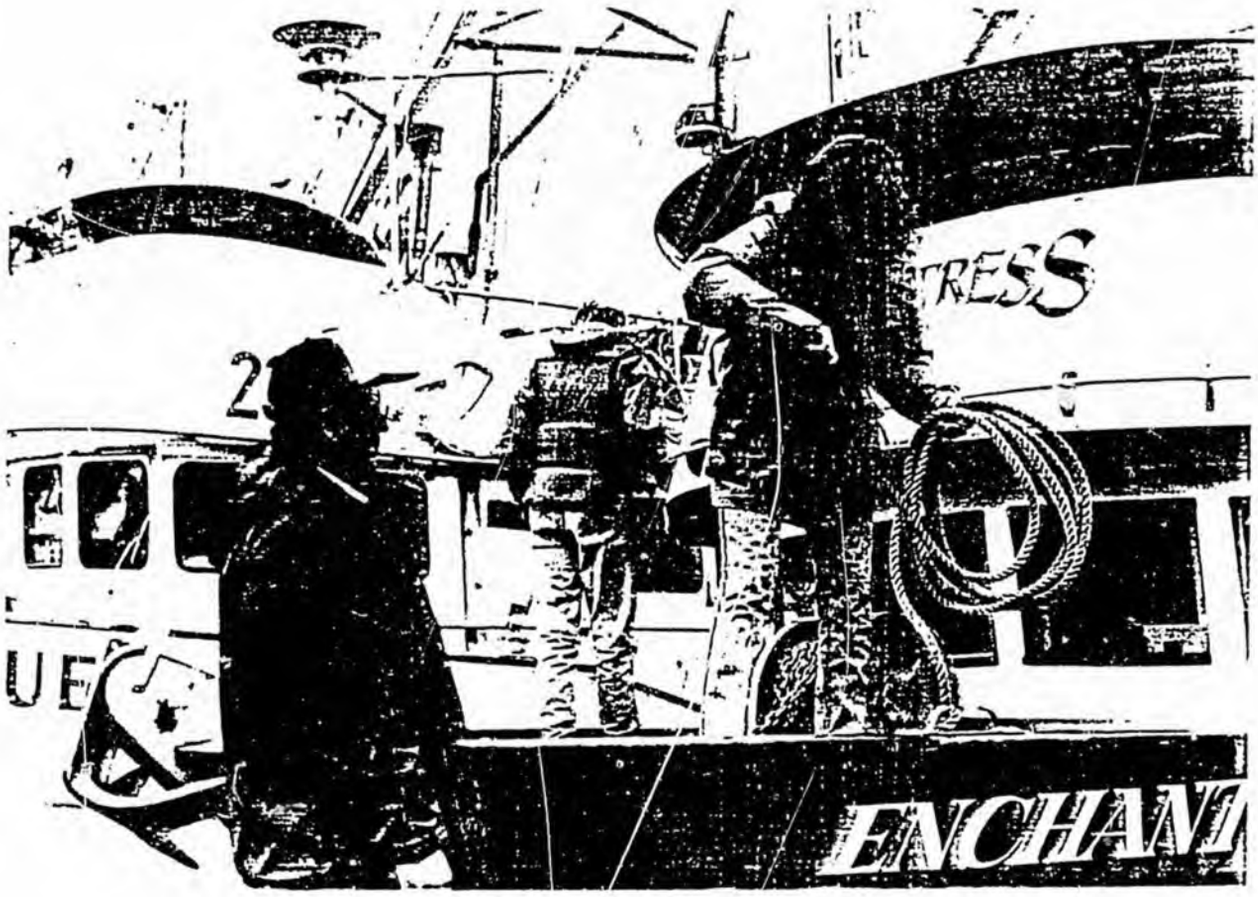
Other coastal communities are watching the success of Cordova's program, she said. "Many communities have been concerned about the number of permits leaving the community. A program like this is a good way to keep the permits in the community, and to encourage young people to get involved in the fishing industry."

Courses in the program's curriculum will cover marine biology, marine welding and personal finance. "A lot of these are just basic skills that people living in a coastal community need for daily life," Mickelson said. "A lot has already been covered, but we're just making sure that things like weather, safety and seamanship are integral parts of the program."

The program might serve as an incentive for some students to stay in school. "We're hoping to provide motivation to keep these kids in school," said Mickelson. "To be a successful fisherman or woman, you need your English and math skills because fishing means doing lots of bookkeeping, preparing or at least understanding taxes, and reading to stay on top of new techologies."

"One thing we want to do in addition to the classes, is take students out on field trips," she added. "We want to make the program as much hands-on as possible, so they'll have a chance to coil the rope, steer the boat, plot the chart. I don't think you really learn it until you've done it yourself."

The Cordova Fisheries Apprenticeship Program is jointly sponsored by Cordova Public Schools, the City of Cordova, and the Cordova Aquatic Marketing Association.



Skipper Pete Blake instructs Teresa Werner and Josh Billings on the correct way to coil the rope as they untie the boat prior to departure.

THE CORDOVA TIMES

Prince William Sound's Oldest Newspaper
Established 1914

50 CENTS | CORDOVA, ALASKA, THURSDAY, MARCH 3, 1988 | VOL. 74, NO. 9

win dual meet

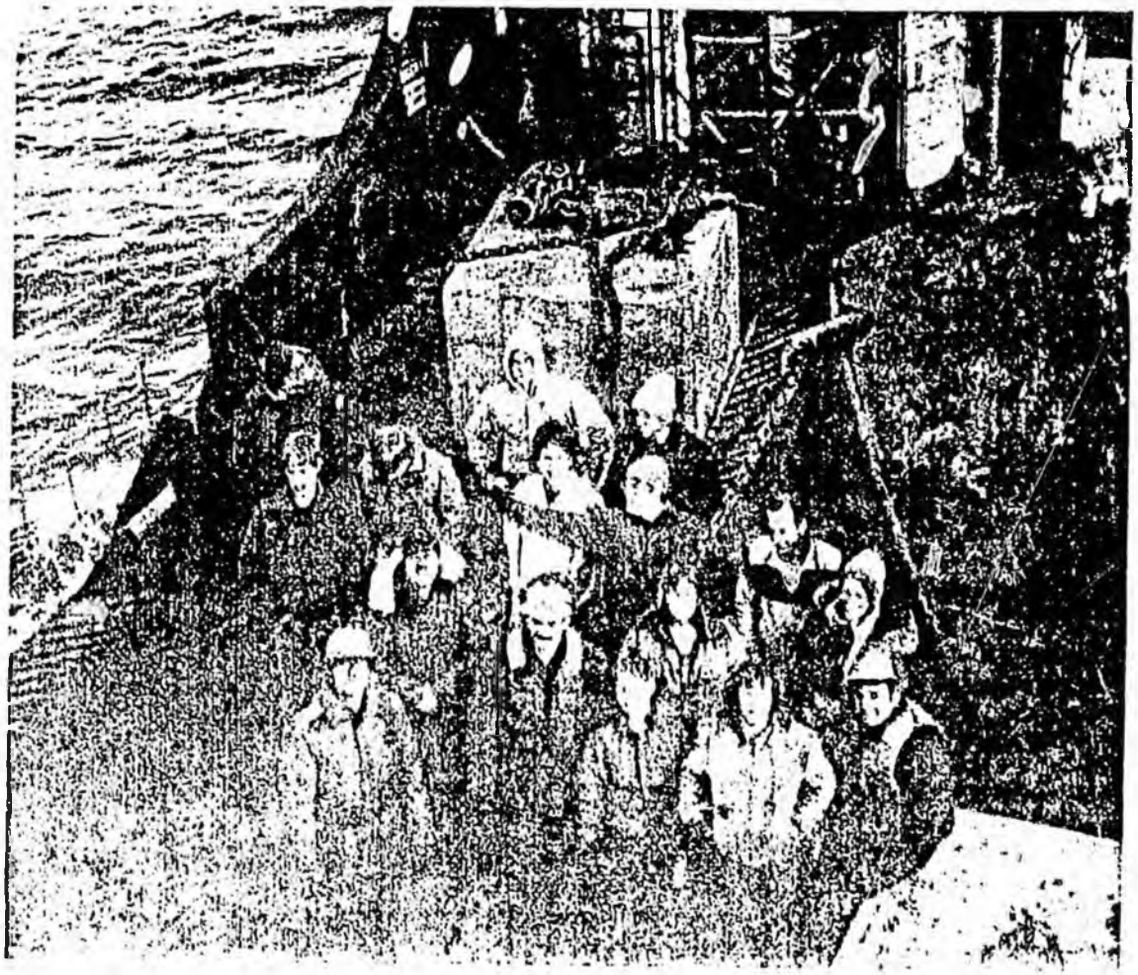
p. A-6

Local glaciers described

p. A-9

Cordovans Comment on future

p. A-3



Students from the Fisheries Apprenticeship Program gather on the deck of the Coast Guard buoy tender Sweetbrier during a recent field trip. Those pictured include Dave Sanders, Teresa Werner, David Glaser, Marcos Vogelpohl, Nail Galasich, instructor Belle Mickelson, Jim Bass, Andy Billings, Patty Hamelin, Josh Billingshir Havens, Jerry LeMasters and the Sweetbrier's Lt. Cmdr. John Cook. The class meets daily before school and has several more field trips planned.

Two field trips on the Discovery enjoyed by students

By Rebecca Hom

Nine students from Cordova High School received a first hand look at marine biology aboard the vessel Discovery last Thursday night. The trip to Windy Bay on Hawkins Island introduced those students interested to the Commercial Fisheries Apprenticeship Program.

The students conducted experiments in water turbidity, algae growth using secchi disks, and water ph. They also got to see several orcas (killer whales), sea otters and seals.

The unique program, co-sponsored by the Cordova Aquatic Marketing Association (CAMA), Cordova Public Schools and the City of Cordova, is designed to prepare students for entry into the fishing industry. They will enroll in courses at the high school and Prince William Sound Community College and, in the summers, will work as apprentice crewmembers on local fishing vessels.

When asked by program director Belle Mickelson what the students liked most about the program, the unifed response was, "JOBS!" Local fishermen Ken Adams, Dan Bilderback, Pete Nippell and Ricki Ott accompanied the students on Thursday's trip to talk about the "fishing life" and discuss opportunities in the commercial fishing industry.

An unexpected opportunity for the students to see some marine rescue techniques occurred when the crew of the Discovery assisted a small pleasure boat, owned by Dr. Larry Ermold. The vessel had hung up on a rock in Windy Bay but was successfully pulled off and, apparently, only sustained minor damage.

On Thursday morning, a larger group of general science students from Cordova High School enjoyed a four hour field trip on the Discovery. The vessel will be leaving Cordova shortly for Southeast Alaska where it will host sportfishing clients.

Students lower the Van Dorn bottle — a tool used to collect subsurface water samples — with instructions from Belle Mickelson, director of the Commercial Fisheries Apprenticeship Program.(Photo by Rebecca Hom)

Students Melanie Guerrero and Dea Church work with Ricki Ott, a local gillnetter and fisheries and marine biologist, on some of the samples taken during their field trip.(Photo by Rebecca Hom)

Belle Mickelson and Ricki Ott exclaim and point at several orcas (killer whales) seen near the vessel.(Photo by Rebecca Hom)

Alaskan Youth Preparing for a Fishing Future in Alaska

Prepared for
Commerical Fisheries Apprenticeship Program
by Graphic Arts II
Cordova High School

Renewable Natural Resources/ Agriculture Curriculum

Secondary and Postsecondary Articulated Curriculum

State of Alaska
Steve Cowper, Governor

Developed by the
ALASKA DEPARTMENT OF EDUCATION
Adult and Vocational Education

William Demmert, Commissioner

Karen Ryals, Acting Director for Vocational Education

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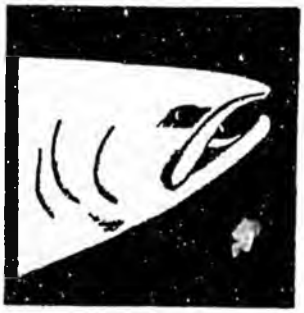
Alaska Department of Education 1988

Table of Contents

Fishing and Fisheries



(A) Denotes more advanced competency or task.

I. Work with the Resource.

Competency: **Identify employment and educational opportunities in fishing and fisheries**

Tasks:
Identify educational and occupational opportunities
Locate resources for finding employment
List prospective employers
Identify and implement SOEP, Coop, or OJT
Identify work in:

a. fisheries enhancement
b. hatcheries
c. commercial fishing
d. canneries
e. cold storages
d. equipment and facility maintenance
e. fish and game biology
f. fish and wildlife protection
g. sports fishing
h. fisheries laboratories

II. Use the Resource.

A. Safety

Competency: **Practice personal safety and accident prevention**

Tasks:
Prepare for vessel emergencies
Explain emergency procedures for: fire, collisions, capsize, foundering, man-overboard and personal injuries:

a. alert crew
b. issue personal flotation and immersion protection devices
c. administer first aid to prevent shock and control bleeding
d. administer CPR
e. don survival suit
e. launch and operate lifeboat and life raft
f. close emergency fuel shutoff valves
g. extinguish Class "C" fire
h. act as lookout to keep person in sight who has been lost overboard
i. secure engine room to prevent spread of fire
j. send out distress signals
k. sound abandon-ship alarm

Use cold-water survival skills
Treat victims for hypothermia
Apply first aid
Explain preparation for helicopter rescue
Use life raft survival
Explain survival suit use
Identify shore survival techniques
Identify sources of water and food in a wilderness setting

Competency: **Use boating safety and seamanship skills**

Tasks:
Explain the basic terms and principles of seamanship
Use basic knot techniques
Describe boating laws
Explain navigational aids and charts
Use nautical equipment including:

a. barometers
b. CB
c. compasses
d. dividers
e. fathometers
f. loran
g. marine radios
h. radar
i. sextants
j. sonar

Use marine VHF, using proper procedures, etiquette, and channels
Obtain and explain a current weather forecast
Recognize changes in weather conditions
Recognize importance of US Coast Guard
(A) Complete a USCG license course

B. Seamanship.

Competency: **Use a tide book, nautical chart, and coast pilot**

Tasks:
Determine tide for a given location
Explain how to determine tide from a known tide level
Use the "Rule of Twelve" to determine tide level at any point in tidal cycle
Identify symbols used on nautical charts
Plot and find directions and distances on a chart
Read current tables

Competency: **Check out and get a vessel underway**

Tasks:
Develop and follow a check list for getting underway
Engage bilge and engine room blowers and bilge pumps
Maintain proper level of coolant in expansion tank
Determine if all navigation lights are functioning
Tighten engine mounts
Inspect fire-fighting equipment for wear, location, and type
Secure deck equipment, lashings, hausers, or mooring lines
Inspect personal flotation devices for number, fit, integrity, and location
Inspect survival suits for number, fit, integrity, location and type
Inspect vessel for fuel leakage
Prepare list of equipment to be checked for oil leakage
Secure watertight doors, hatches, vents, and skylights
Bleed air compressor of water
Check and maintain batteries
Determine fuel levels
Inspect water level indicators for cleanliness
Test radio equipment
Inspect antennas
Determine if hydraulic steering equipment is free of air and water
Determine that rudder stuffing box is functioning properly
Tighten propeller stuffing box
Determine if proper voltage is being generated
File a float plan

Competency: **Maneuver a vessel**

Tasks:
Observe the "rules of the road"
Follow safe boating practices
Pilot using dead reckoning, time, distance, and speed
Use various forms of running fixes including:
a. 45-90
b. 22 1/2-45 c. 26 1/2-45
Pilot using a cross bearing
Use navigational aids, tide and current charts and equipment
Maintain adequate safety margins regarding weather and sea conditions

Competency: **Use the rules of the road**

Tasks:
Identify marine vessel boundaries
Identify terms and definitions related to marine charts and rules of the road
Use steering and sailing rules including:
a. rules when approaching sailing vessels
b. rules for vessels meeting, nearing a bend, leaving berth
c. rules for passing a vessel head on
d. rules for overtaking a vessel
e. general prudential rule
Identify special situation lighting and signals
Plot a course on a chart and convert true bearings to compass bearings
Identify day markers and fog signals
Identify distress signals

Competency: **Use modern electronic systems**

Tasks:
Use echosounders and depthfinders to:
a. differentiate among types
b. interpreting signals
Use Radio Direction Finders (RDF) to:
a. identify range of equipment available
b. install loop antenna
c. use RDF aboard small craft
d. identify marine radio beacon stations and systems
e. plot radio bearing and finding position with RDF
Use RADAR including:
a. install, identify components of, and operate RADAR
b. use RADAR as a navigational aid
c. interpret RADAR signals
d. pilot using RADAR
e. monitor RADAR beacons (RACON)
f. identify radiation hazards
g. install and use RADAR reflectors
Use LORAN C or OMEGA including:
a. explain hyperbolic navigation systems
b. differentiate among groundwaves and skywaves
c. characterize LORAN C and OMEGA receivers
d. navigate with LORAN C

Use SONAR
- a. install, identify components of, and operate SONAR
- b. interpret SONAR signals
- c. navigate and find fish with SONAR

Competency: Use marine lights and sound signals

Tasks: Explain when marine lights are needed
Identify rules for the following situations:
- a. steam vessel underway
- b. steam vessel towing and pushing
- c. sailing vessel and vessels in tow
- d. small vessels
- e. pilot vessels
- f. fishing vessels
- g. stern lights
- h. anchor lights
- i. signals to attract attention

Sound signals for the following situations:
- a. steam vessels underway
- b. sailing vessels underway
- c. vessels at anchor
- d. vessels towing or being towed
- e. speed in fog

Competency: Get along with other members of crew

Tasks: Explain common causes of strife aboard vessels
Explain the importance of getting along with others while at sea
Utilize stress-reduction techniques
Utilize communications techniques
Practice communications techniques with others
Explain how to take a grievance to the captain

Competency: Anchor vessel

Tasks: Anchor vessel by using anchor winch or windlass
Secure anchor on bottom
Retrieve and secure anchor and stack (tier) anchor chain in locker

Competency: Dock a vessel

Tasks: Assign tasks and stations for vessel mooring
Maneuver to dock
Secure mooring lines to dock and/or other vessels
Secure engine room and secure propeller shaft
Release towing gear

C. Building, handling, and maintaining gear

Competency: Build, mend and repair nets and lines

Tasks: Define terms related to net and line construction and repair
Build, mend and repair lines including:
- a. corkline
- b. leadline
- c. weedline
- d. breastline

Melt, tape, or whip line ends to prevent unraveling

Mend nets by:

a. using 1, 2, and 3-bar hole repair
b. trimming problem area
c. initiating starter knot
d. using pick up sider and bar
e. maintaining proper net length with repair

Patch nets by:

a. trimming problem area
b. splitting edges
c. squaring repair patch
d. lacing twine

Complete complicated net and line repairs

Competency: Operate and maintain gear hydraulics

Tasks:
Define basic principles of hydraulics
Diagram vessel hydraulic systems
Use proper hand signals while operating hydraulic equipment

Competency: Maintain and operate processing equipment

Tasks: Explain the maintenance and operating procedures for:

a. freezing equipment
b. canning equipment
c. ice-making equipment
d. auxiliary power generating equip.
e. seafood cleaning equipment
f. conveyor and product handling equip.
g. chilling and cooling equipment
h. testing and quality control equipment

D. Vessel operation and maintenance.

Competency: Conduct deckhand duties

Tasks:
Wear proper clothing for duties
Hand or hoist equipment and supplies aboard
Cast vessel off
Coil lines
Work riggings such as nets, slings, hooks, cables, booms, and hoists
Stand lookout, steering, and engine room watches
Operate dories, dinghies, and skiffs
Attach accessories, such as floats, weights, and markers to nets and lines
Pull and guide nets and lines onto vessel
Wash deck, conveyors, knives, and other equipment, using brush, detergent, and water
Lubricate, adjust, and maintain engines and equipment

Competency: Maintain vessels

Tasks:
Arrange for grid, dry docking, or haul-out
Change brushes in auxiliary engines
Change lube oil and fuel filters on auxiliary engines
Determine if motor bearings are excessively worn
Clean electric motor
Prepare list of hoses, valves, connections, gaskets, and tanks needing repairs
Determine if const-a-voltage regulator is functioning properly
Determine if drive belts on air compressors are excessively loose
Tighten panel box fittings to prevent vibration
Clean keel cool strainers, oil coolers and oil strainers in marine gears

Drain water out of fuel traps
Tighten fuel and oil line connections on engines
Inspect day tanks containing fuel for leaks
Lubricate deck and engine room equipment
Determine vessel's manning requirements
Splice eye into line
Wash down vessel's superstructure and decks
Inspect and maintain hull, keel, and rudder assembly

Competency: Prevent marine corrosion problems

Tasks:
Explain how electrolysis causes marine corrosion
Design appropriate bonding systems for vessel components
Wash, brush, and paint problem areas

E. Other duties and skills.

Competency: Prepare meals aboard the vessel

Tasks:
Plan menus
Order supplies
Store food properly
Prepare a balanced meal
Clean galley deck, woodwork, cabinets, dishes, glasses, flatware, trays, pots and pans
Practice safety with oil stoves
Use a microwave
Use a fire extinguisher

Competency: Maintain and analyze records related to fishing

Tasks:
Maintain trip record
Maintain ship's log
Maintain business ledger
Record catch
Record income
Record fish sales records
Keep expense records
Use checking account
Reconcile bank statement
Inventory assets
Analyze profits and losses including:
a. variable and fixed costs
b. opportunity cost
c. return to labor, management investment
Determine net worth
Apply skills to SOEP, Coop, or OJT

(A) Competency: Secure loans from bank and state agencies

Tasks:
Differentiate among types of credit:
a. commercial credit
b. production credit
c. state loans

Explain the procedure for obtaining a limited entry permit
Keep records related to loan

(A) Competency: Compute the tax liabilities of a fisherman

Tasks:
Calculate estimated tax payments
Calculate depreciation of vessel and other equipment
Calculate investment credit
Calculate sale and exchange of assets
Calculate deduction and substantiation

F. On-board fish handling.

Competency: Understand the importance of fish quality

Tasks:
Explain the importance of maintaining on-board fish quality
Maintain fish quality

Competency: Handle fish correctly aboard the vessel

Tasks:
Explain the importance of good handling practices
Relate catching rates to correct fish handling
Correctly bleed and gut fish
Wash fish
Store fish on the vessel
Unload fish from vessel

Competency: Practice vessel sanitation

Tasks:
Explain the importance of vessel and product sanitation
Use sanitation tools
Use chemical sanitizers
Identify potential sanitation problems

Competency: Store fish aboard the fishing vessel

Tasks:
Explain the importance of chilling seafood
Store fish without refrigeration
Ice fish
Store fish with chilled sea water
Store fish with refrigerated sea water
Freeze fish at sea

G. Marine products processing.

Competency: **Process fish**

Tasks: Describe both shore-based and floating processing operations
Use processing procedures including:

a. assembly-line processing
b. beheading
c. gutting
d. skinning
e. scaling
f. cleaning
g. icing
h. chilling and cooling
i. crating
j. canning
k. cooking
l. drying
m. smoking
n. foil wrapping
o. freezing
p. maintaining quality control
w. shipping live

Explain steps involved in roe processing

Competency: **Handle and process marine products**

Tasks: Store fish products using icing and refrigeration
Clean seafood
Use quality control in processing
Keep seafood cool, clean, moist and moving
Pack fish eggs for shipping
(A) Trace marine products from the ocean to the retailer
(A) Explain economics of seafood processing
(A) Explain marketing considerations involved in proper seafood handling

Competency: **Maintain fish quality during storage and shipping**

Tasks: Explain the importance of chilling seafood
Define fish processing and refrigeration terms
Identify fish processing sanitation principles and procedures
Determine how long various marine products can be preserved by refrigeration
Identify potential chemical, biological and bacteriological problems in the fishing industry

a. conduct bacteria tests
b. identify problems by sight and smell
c. dispose of contaminated marine products
d. recognize how to anticipate and prevent sanitation problems before they occur

Explain upper and lower refrigeration temperature limits for the various marine products

a. recognize potential sanitation problems
b. explain disinfecting procedures
c. plan stock rotation to insure freshness
d. control temperature during processing

Control/modify atmosphere storage of product
Freeze product
Ship processed product

Competency: **Sanitize seafood plant**

Tasks:
Explain the importance of cleaning and sanitizing seafood plant
Use cleaning equipment
Use chemical sanitizers
Control pests
Maintain personal health and hygiene

H. Actively fish.

Competency: **Net fish**

Tasks:
Explain principles and techniques associated with various net fisheries
Locate quarry using equipment available
Operate and maintain net fishing equipment such as dip, diver, gill, hoop, lampara, pound, trap, reef, trammel, and travel nets
Operate and maintain seine equipment such as purse seine, haul, drag, or beach seine and power skiffs
Insert and attach hoops, rods, poles, ropes, floats, weights, beam runners, other boards, and cables to form, reinforce, position, set, tow, and anchor net as required
Tow net to location and anchor in place
Attach appropriate flags and lights to buoys to mark and identify nets
Haul net with appropriate gear
Remove catch using appropriate techniques and equipment such as dip net, brail buckets, hydraulic pumps, conveyor, lifting net, blocks, tackles, and dumping catches
Clean, store and transfer catch appropriately
Sort and clean fish, throwing undesirable and illegal catch overboard
Stow catch in hold or transfer to tender
Repair fishing nets and gear
Complete minor repairs of engines and equipment
Wash deck and equipment

Competency: **Line fish**

Tasks:
Define line fishing terms
Explain principles and techniques associated with various line fisheries
Lay out gear
Attach:
a. hooks
b. bait
c. sinkers
d. anchors
e. floats
Anchor bottom line for bottom fishery
Cast line into water and hold, anchor, or troll for troll fishery
Retrieve gear onto boat deck by hand, reel, or winch
Haul line by hand or reel and winch onto deck
Unload fish from boat
Clean, pack and store catch appropriately
Slit fish, remove viscera, wash cavity and prepare for storage
Wash deck and equipment using brush, detergent and water
Lubricate and make minor repairs to engines and equipment

Competency: **Pot and trawl fish**

Tasks:
Define pot fishing terms
Explain pot fishing techniques
Rig boat and deploy gear such as pots, floats and markers
Tie marker float to line, attach line to pot, fasten bait inside pot, and lower pot into water
Retrieve gear and remove catch
Hook marker float with pole and haul up pot
Remove catch or dump catch on deck
Measure catch with fixed gauge
Place legal catch in container and return illegal catch to sea
If applicable, rig and lower dredge (rake scoop with bag net attached), drag dredge behind boat to gather marine life from water bottom, and hoist it to deck by hand using block and tackle
Store catch aboard vessel

(A) Competency: **Plan and implement mariculture venture, SOEP, Coop, or OJT**

Tasks:
Gain capital securities
Obtain required permits and necessary statements
Complete business plan including:
a. five-year cash flow plan
b. production system
c. construction and operating costs
d. expected problems and solution
e. projected market supply and demand
f. projection of overall stability and flexibility

(A) Competency: **Analyze economic factors related to a mariculture venture**

Tasks:
Analyze economic factors including:
a. tenure of site
b. initial capital investment for constructing and operating
c. environmental conditions which will affect production cost
d. level of security needed
e. transportation means and distance to marketplace
f. local competitors
g. type and cost of personnel

(A) Competency: **Select species for mariculture venture**

Tasks:
Analyze viability of species including:
a. sources and availability of stocking species
b. stocking density and rates
c. feeding requirement and sources, availability, cost, quality, quantity, etc.
d. growth rates
e. behavioral response to environmental stress, handling, and transporting
f. vulnerability to disease and predators, and response to treatment
g. behavior patterns which will influence management strategies
h. harvesting strategies and frequencies

Analyze marketability of selected species including:
- a. demand throughout the year and its stability
- b. supply throughout the year and degree of saturation
- c. wholesale and retail prices
- d. consumer's preferences
- e. similar and substitute products
- f. expenses and cost
- g. gross and net profits
- h. rate of return

(A) Competency: Locate feasible mariculture site

Tasks: Analyze environmental resources including:
- a. sea conditions
- b. bottom conditions
- c. topography of site and surrounding areas
- d. climatic conditions
- e. other uses of site
- f. accessibility throughout the year
- g. activities of surrounding area
- h. other marine resources present and impacts of mariculture development

(A) Competency: Construct and maintain mariculture site

Tasks: Examine area

Sketch out design, taking into account:
- a. biological needs of the cultured species
- b. ecological needs of the cultured species
- c. utilizing topography and environment so as to minimize operating costs
- d. keeping harvesting methods efficient
- e. keeping construction costs minimal

Remove obstacles which may interfere with operations

Select appropriate type and size of cage to:
- a. meet the biological need of the cultured species
- b. withstand the elements
- c. endure pressure of water current and when transporting
- d. screen out predators

Examine unit cost per cage in relation to operating, harvesting, yields, and net profit

Design cage lay-out system considering:
- a. position of cages in water column
- b. water quality and circulation
- c. predators
- d. disease
- e. ease of cultivation
- f. ease of transportation
- g. unexpected problems
- h. security

Construct cages to endure interaction with environment

Install and secure cages

Maintain cages

(A) Competency: Stock and maintain species in cages

Tasks: Calculate proper stock density considering:
- a. natural productivity
- b. the need for supplemental feeding and/or fertilizer
- c. the size of the cages
- d. biological characteristics of the target species
- e. economic (profitability) factors

Check that stocking material are healthy

Acclimate stocking material to sea water and sea water temperature and release
Determine available natural food source by analyzing:
a. quality of food present
b. quantity of food present
c. environmental influences including temperature, sunlight, and water chemical characteristics
d. characteristics of the cage
Clean cages of undesirable sea life
Select feeds to meet nutritional requirements of target species
Determine feeding rates and amount
Mix, mince, dry, and/or cook foods as needed
Store foods
Apply feeds manually, mechanically, and/or automatically

(A) Competency: Harvest mariculture fish and/or material

Tasks:
Net, trap and/or lift material from cages
Process fish and/or material, including:
a. sorting and grading
b. chilling or putting fresh material in tanks
c. freezing whole, tails only, or fillets, depending on market
Transport fish and/or material to market

(A) Competency: Increase production as feasible

Tasks:
Increase production by:
a. expanding numbers of cages
b. manipulating stocking frequency and rates
c. sorting population size and/or ages, then segregating into different ponds
d. using supplemental feeding techniques and formulas
e. altering harvesting techniques

III. Manage and Protect the Resource.

Competency: Understand the important state and federal regulations and regulatory agencies pertaining to fisheries

Tasks:
Identify the role of:
a. State Board of Fisheries
b. fishery advisory committees
c. International Halibut Commission
d. Alaska Department of Fish and Game
e. Alaska Division of Fish and Wildlife Protection
f. U.S. Coast Guard
Identify rules pertaining to catch and size for local fishery - include throwing illegal catch overboard

Competency: **Understand the important state and federal regulations and regulatory agencies pertaining to navigation**

Tasks: Identify different classes of vessels including:

a. Class A
b. Class 1
c. Class 2
d. Class 3

Register vessel and display number on boat
Explain how vessels and/or captains may take passengers for hire
Explain enforcement of rules of navigation
Identify the role of the U.S. Coast Guard
Explain rules pertaining to distressed vessels

Competency: **Understand fish management practices**

Tasks: Assess fish stock
Explain concepts of sustained yield fishery
Explain concepts of limited entry fisheries
Identify the consequences of fishery over-exploitation
Explain the future of local and statewide fisheries
Trap and strip fish
Maintain rear ponds
Stock lakes and streams
Rehabilitate waters
Explain how to rescue fish
Survey fish
Remove rough fish
Improve spawn areas
Explain enforcement of proper fishing harvest laws and fish habitat protection laws

(A) Competency: **Define important factors for hatchery placement**

Tasks: Contrast early salmon hatcheries with contemporary ones
Explain the need for salmon hatcheries
Explain a hatchery's need for a steady water supply
Explain environmental factors of salmon hatchery placement
Explain the importance of proximity to good fish habitat

Competency: **Define important hatchery techniques**

Tasks: Explain salmon hatchery spawning
Explain salmon hatchery incubation
Explain the feeding of salmon fry
Explain the issue of fish disease in hatcheries
Explain how hatchery smolt are released

Competency: **Work in a hatchery**

Tasks: Complete paperwork related to hatchery
Construct and maintain incubation system
Collect adults to serve as brood stock
Transport milt and eggs
Fertilize eggs
Monitor eggs during incubation

Identify various developmental stages
Remove dead fish and eggs
Determine survival rates at various stages of development
Maintain environmental factors promoting the development and survival of eggs, fry, and adults
Collect and analyze samples from incubation water
Mark released fry
Monitor return runs to establish survival rates
Collect, record, and analyze data obtained

Competency: **Care for fish in a hatchery**

Tasks:
Explain salmon development from unfertilized egg to adult salmon
Define anadromous
Identify salmon hatchery procedures
Identify internal and external characteristics of salmon anatomy
Identify environmental factors affecting salmon survival
Identify natural events and cycles affecting salmon survival

Competency: **Manage salmon**

Tasks:
Identify agencies involved in management of Alaska's salmon
Explain different methods for assessing the fishery
Identify the goals of salmon management

IV. Define the Resource.

Competency: **Understand Alaska's water resources**

Tasks:
Explain the origins of the oceans
Examine the geology of Alaska's sea bottom
Point out major tidal areas in Alaska
Explain possible effects of water pollution on Alaska's water resources
Point out locations of major Alaskan fisheries
Identify major Alaskan seaports
Identify major Alaskan watersheds

Competency: **Identify attributes of Alaska's commercial fish species**

Tasks:
Understand attributes of salmonids including:
a. external anatomy
b. internal anatomy
c. classification
d. distinguishing characteristics
e. life histories including:
    1. embryology
    2. life history stages

Identify attributes of bottomfish including:
a. anatomy
b. classification
c. distinguishing characteristics
d. life history including:
    1. embryology
    2. life history stages

Identify attributes of dungeness, tanner, and king crabs including:
- a. anatomy
- b. classification
- c. distinguishing characteristics
- d. life history including:
  1. embryology
  2. life history stages

Identify attributes of shrimp including:
- a. anatomy
- b. classification
- c. distinguishing characteristics
- d. life history including:
  1. embryology
  2. life history

Identify the natural foods of fish including:
- a. aquatic insects
- b. plankton

Age fish by:
- a. scales
- b. otoliths
- c. bones
- d. back calculations (growth)

Use plankton net in studying microscopic water life
Use hand dredge for examination of bottom samples
Use seines for identification of small forage fish
Identify Alaska's under-utilized marine resources

Competency: **Understand the life cycles of Pacific salmon**

Tasks: Explain the:
- a. hatching process of salmon
- b. life processes of salmon fry
- c. life processes of adult salmon
- d. reproductive phase of salmon
- e. importance of dead salmon to stream replenishment
- f. issue of man-made hindrances to salmon reproduction

V. Understand the Importance of the Resource.

Competency: **Understand the economic importance of fishing to Alaska**

Tasks: Understand the importance of marketing fisheries resources to the viability of Alaska's fishing industry
Identify the relative dollar value of the Alaskan fishing industry
Locate important Alaskan fishing ports on a map
Identify potential expansion in the fishing industry including:
- a. salmon farms
- b. oyster farms
- c. other shellfish and finfish mariculture developments
- d. bottom fishery

Explain the importance of seafood in the life and economy of Alaska
Contrast life histories of the major commercial fishery species of Alaska
Contrast methods, vessels and gear involved in the Alaskan commercial fisheries
Explain how fisheries managers attempt to regulate the fisheries to the mutual benefit of the resource and the fisherman

Compare and contrast the following fisheries:

a. salmon
b. halibut
c. herring
d. king crab and tanner crab
e. bottom fish
f. shrimp and other invertebrates
g. shellfish

Identify different species within each fishery
Identify gear and vessels used for each fishery

Competency: Understand the traditional importance of fishing to Alaska

Tasks: Trace the history of the marine harvest in Alaska including:

a. historic Native harvest
b. Russian fur trade
c. turn of the century canneries

Relate the importance of fishing to Native Alaskan cultures
Contrast the Native salmon fishery past and present with the non-Native salmon fishery
Project future trends in Alaska's fisheries

Competency: Understand the international importance of fishing to Alaska

Tasks: Identify foreign fishing fleets which frequent Alaskan waters
Identify international rules and regulations which pertain to fishing in Alaskan waters
Identify boundaries of U.S. fishing regulations

VI. Understand Competing Uses.

Competency: Understand the role of fisheries management

Tasks: Explain the importance of fisheries management
Identify general management policies related to fish species including:

a. sport fish
b. rough fish
c. forage fish

Identify general management policies related to fish habitat management

Competency: Understand forces competing for Alaska's fishery resources

Tasks: Identify state, national, and international groups competing for Alaska's fishery resources
Explain the introduction of shellfish and finfish mariculture on traditional fisheries

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RESEARCH REQUEST

by

Representative Adelheid Herrmann

(insert date)

This research request originates from a paper prepared for me by Bill Hall entitled "Education and Training as a Solution to the Problem of Alaska Hire in the Alaska Seafood Industry". In that paper Mr. Hall made the following recommendations.

> The primary goal of the state's fishery education program should be to equip Alaskans with the employment and entrepeneurial skills necessary to fulfill the present and future needs of the state's seafood industry."
>
> If the foregoing proposition can be accepted by state government officials and industry leaders, then the problem of organization becomes primarily <u>a problem of defining educational goals in terms of industry needs and market opportunities.</u>

As a first step in defining this problem, I met with a group called the Seafood Industry Advisory Group within the Department of Labor to request their assistance in defining the educational and training needs of the industry. That group has agreed to develop a description of present and developing job skills and to serve as a steering committee for industry's participation in the development of a state program.

As a second step I am requesting that the House Research Agency conduct a study for the purpose of producing an overview of seafood educational programs in other parts of the world, and in the United States. This information could then be used

as one basis for evaluating Alaska's seafood industry educational program in terms of its present and future goals, structure, content and performance. It will also be useful in considering how Alaska might improve the present system or possibly create a new one.

As a starting place, please read the enclosed copy of Mr. Hall's paper with specific regard to sections 2 and 3 on pages 17 and 18. I have discussed this research request with him, and he has agreed to work with you on my behalf in the development of the particulars for the study. He also has some information that may be of use to you in beginning your research. His telephone number is (907) 276-2007.

EDUCATION AND TRAINING AS A SOLUTION

to

THE PROBLEM OF ALASKA HIRE

in

THE ALASKA SEAFOOD INDUSTRY

by

A. W. HALL

June 10, 1987

INTRODUCTION

This proposal has been prepared at the request of Representative Adelheid Herrmann. It is the result of conversations between the author and certain Representatives of the Alaska Legislature, specifically Representatives Herrmann, Koponen, and Martin, regarding a lack of Alaska hire in the state's seafood industry.

The problem of Alaska hire while important is only a part of the larger problem of maximizing the Alaskan share of benefits generated by the utilization of the state's fisheries resources. A Fisheries Policy Task Force Report submitted to Governor Bill Sheffield in June of 1983 addressed this issue when it concluded a discussion on the state constitution's section on natural resources with the following statement.

> It would appear from the foregoing that if the State is to fulfill its constitutional responsibilities of managing its fisheries resources to serve the maximum public interest and to provide the maximum benefit to the people, then it must adopt a State fisheries policy that incorporates biological, social and economic goals, and it must reorganize the structure of state fisheries programs so as to facilitate the efficient realization of those goals.

The report continued by recommending adoption of the following goal statement as the foundation of a state fisheries policy.

> It is the policy of the State of Alaska that the goal of all government activities involved with or related to the fishery resources of the State shall be to perpetually produce the maximum economic and social benefits for the people of the State.

The topic of this paper then is the examination of education and training as one solution to the broad problem of increasing the Alaskan share of benefits generated by the Alaska seafood industry. The program envisioned is a program of education and training the purpose of which is to equip Alaskans with the employment and entrepreneurial skills necessary to fulfill the present and future needs of the state's seafood industry. But before addressing the specifics of an educational program, a limited examination of the potential employment and entrepreneurial opportunities available to Alaskans should be made.

THE ALASKA FISHING INDUSTRY

The Washington State Perspective:

There is no publication presently available that provides a contemporary economic overview of Alaska's commercial fisheries. However, there is a publication entitled "Commercial Fishing and the State of Washington" written by Natural Resource Consultants (NRC) of Seattle, Washington that is subtitled "A Contemporary Economic Overview of Local and Distant Water Commercial Fisheries - 1986". This publication has relevance to Alaska's interests because it devotes a substantial part of its contents to the fisheries of the North Pacific and the Bering Sea. Regardless of whether these fisheries are called Washington State fisheries or Alaskan Fisheries they nevertheless

constitute an activity that is located in the same geographic area and that exploits the same fishery resources. This commonality of interest is based in the origins and development of the North Pacific fisheries, and is described by NRC in the following statements that are excerpted from the section entitled "History of Washington Fisheries".

> As the demand for seafood increased, the fishermen and processors of Washington expanded their activities to the south and north. In particular, they would become a dominant force in the development of the fisheries of Alaska.
>
> The extensive distant water fisheries which developed in Alaska reflected the trade and economic interdependence which linked the Puget sound region and the Alaska territory.
>
> Over time, a unique symbiotic relationship has evolved between the Washington and Alaska (salmon) fishing segment; harvesting and processing largely occurs in Alaska while marketing, distribution and corporate management takes place in the Puget Sound region.

The following excerpts from "Commercial Fishing and the State of Washington" further serve to illustrate and document the economic magnitude of the fisheries off Alaska's extensive coastline as well as the relationship that exists between the two states.

Distant Water Fisheries

> In 1985 for example, distant water fisheries (of Washington State) were conducted by a fleet numbering more than 1,300 vessels having a current capitalized value of at least $770 million. These vessels, ranging from 32-foot salmon gillnetters to a 300-foot factory trawler, provide work for more than 6,000 fishermen (see table on page 33). This diverse fleet in 1985 logged catches exceeding 2.1 billion pounds. This impressive harvest was valued at some $290 million at the fisherman level or about 2.6 times the ex-harvester value of all local fishing and aquaculture production.

Except for joint venture groundfish, which are sold as round fish for processing aboard foreign ships, most of the distant water fish and shellfish catches are processed, at least to a preliminary extent, in Alaska, and about 90 percent of this processing work is completed in facilities owned by companies headquartered in Washington.

Salmon Fisheries

In recent years, close to 770 vessels valued at over $95 million have formed the distant water salmon armada.

In 1985 , the value of the $108 million catch about equaled the total exharvester value of the combined local Washington fisheries.

The vast majority of the distant water salmon catch is taken in Alaska state waters or waters adjacent to them. The remainder is harvested by troll fishermen off Oregon and California. The Washington fishermen's share of the Alaska salmon harvest has increased from 24 percent in 1981 to 30 percent in 1985.

Over 2,000 Washington fishermen are involved in the distant water salmon harvest, most of them participating in the Alaska fisheries.

Trawl Fisheries

In total, the distant water trawl fleet landed over 1.8 billion pounds of food fish worth over $141 million at the wholesale level in 1985, the largest component of Washington distant water operations in terms of poundage. Although some distant water trawl fishing has been conducted off Oregon and, prior to the extension of Canadian territorial waters, off British Columbia, the vast majority of the current Washington fleet operates in the Gulf of Alaska and Bering Sea. The chief target species for these operations is Alaska pollock, followed by yellow fin sole, Pacific cod and smaller quantities of other species.

In 1985, an estimated 92 Washington - based vessels participated in distant water trawling. Ranging in length from 70 - 300 feet, and having a collective capitalized value of close to $280 million, the vessels employ over 700 fishermen and processing crew members, many of whom spend five to six months at sea each year.

Crab Fisheries

The Washington king and Tanner crab fleet is perhaps one of the most modern fishing fleets in the world, and its production record is overwhelming. During the ten-year period from 1974-1983, the largely Puget Sound-based fleet

landed more crab than any other fleet of crab vessels in the world.

Fleet size peaked between 1979 and 1980 when 260 vessels were involved in the fishery. Most of these vessels were between 91 and 165 feet in length and were built at a cost of $2 million - $7 million each. Since the rapid decline of both king and tanner crab stocks in the early 1980's, the fleet size has declined to about 109 vessels - the remainder having converted to joint venture trawl operations. This fleet has an estimated capitalized value of over 163 million and employs over 500 (Washington) resident fishermen. There are also an additional 25 catcher-processors and mobile processors worth $138 million involved in the fishery each year. These vessels engage an additional 550 fishermen/processing workers.

The Longline Fisheries

In 1985, approximately 250 Washington - based halibut and sablefish longliners ranging in length from 40 to over 100 feet and carrying an average crew of six, participated in fisheries from California to Alaska. This fleet has an estimated Capitalized value of $86 million.

In 1985 the Washington distant water longline fleet landed a total of 15 million pounds of halibut and 11.6 million pounds of sablefish worth a total of $20.9 million at the ex-vessel level. Of this, 10 million pounds of halibut worth over $7.5 million and 11.4 million pounds of sablefish worth over $7 million were landed in Alaskan ports, while 5 million pounds of halibut valued at over $6 million and a small amount of sablefish were landed in Washington ports.

Washington boats have taken an increasing share of sablefish landings from waters off Alaska since 1981.

Processing and Trade

Washington is also the base of operations for approximately 130 seafood processing/wholesaling and 33 seafood wholesale and cold storage companies. Together, these companies operate 250 primary processing and wholsale plants within the state and over 120 shore - based and at - sea processing operations in Alaska. The local operations employ over 4,000 people seasonally and about half that number throughout the year. Washington owned plants operating in Alaska employ 8,000 people seasonally. Fully one-half of the plant workers are from Washington.

Last, Washington seafood companies process and market a major portion of Alaska seafood exports.

Overview and Conclusions

92% of seafood harvested by Washington Fishermen comes from waters off Alaska.

70% of fleet's revenue is spent in Washington State. 15% is spent in Alaska.

A significant share of the labor employed in Alaska's seasonal salmon and crab fisheries is normally resident in Washington and Oregon. In addition, ownership, management, transportation and marketing activities of these firms are largely Washington - based. A large but essential undocumented part of the value added by processors of fish and shellfish in Alaska thus accrues as direct and indirect income to residents of the Northwest.

The Alaskan Perspective:

It has previously been stated that there is no publication presently available that contains a comprehensive economic overview of Alaska's fisheries. There are however, several publications that do serve to describe the Alaskan perspective as it relates to the seafood industry. One of those publications is entitled a "Fisheries Policy Task Force Report to Governor Bill Sheffield" which is dated June, 1983. The report contained the following statement.

> In summation, the committee and the Task Force are convinced the overall economic health of Alaska's fishing industry hinges on stability, diversification, and development. In order to establish a viable, healthy industry which does indeed maximize benefits to all Alaskans, we must complement and expand our existing fisheries with new product forms and new fisheries. This is within our grasp. The benefits, the jobs, the income, the stability -- all the other associated amenities -- are currently being received, but not by Alaska. It's time to bring our resource home for our own benefit.

Another more recent report that relates to the subject is entitled "Nonresidents Working in Alaska in 1985" which was published by the Alaska Department of Labor in January of 1987. This report contained the following statements.

> -The food processing industry (of which 94% of the firms are in seafood processing) had the highest number of nonresident employees (13,512), the highest percent of wages paid to nonresidents (55%), and the highest percentage of nonresident employees (68%).

The magnitude of nonresident hire in the seafood industry is much greater than the foregoing suggests if the harvesting sector of the industry is considered. Because most commercial fishermen are considered self employed for income tax reporting purposes, they are not included in the Department of Labor statistics. Also, those fishing and processing operations taking place outside of the state's territorial waters (3 miles) are not subject to Alaska law, and are therefore not included in the Dept. of Labor statistics. Categories of employment that might be considered in the harvesting sector include (1) self employed fishermen who are the owner operators of fishing vessels most of whom are required to hold permits from the Alaska Commercial Fisheries Entry Commission, (2) crew members on commercial fishing vessels, and (3) crew members on tendering vessels and floating catcher-processors.

A report entitled "Changes in the Distribution of Permit Ownership in Alaska's Limited Fisheries 1975-1985" published by the Alaska Commercial Fisheries Entry Commission (CFEC) in June of 1986 contained the following statement.

By the end of 1985, the number of permanent permits had decreased to 12,509 due to the revocation of 142 Alaskan permits and 30 Nonresident permits. As a result of transfers, migrations, and loan foreclosures, Alaskan residents owned 145 fewer permits than they had been originally issued and Nonresidents owned 135 more. Ten of the 39 permits repossessed by the Department of Commerce and Economic Development had not been resold at year-end 1985. Thus, the percentage of permits owned by Alaskans had declined to 79.7% (9,963) and the percentage of permits owned by Nonresidents had increased to 20.3% (2,536).

The CFEC has also produced a draft report entitled "Employment and Gross Earnings in Alaska's Commercial Fisheries: Estimates for All Participants and Residents of Alaska, Washington, Oregon and California, 1983-1984". The publication reports that although Alaska residents constituted 74.7% of the participants in the 1984 fisheries, their share of the income from those fisheries was estimated at only 59% of the total.

OPPORTUNITIES FOR ALASKANS

An industry generates its primary economic benefits for people in the form of earnings from employment and investment. The opportunity for Alaskans to increase their share of employment and investment earnings produced by the seafood industry is limited by the potential for expansion of the industry and by the ability of Alaskans to replace non-Alaskans within the existing industry. As the foregoing has demonstrated, Washington State interests constitute the largest share of the non-Alaskan owners and workers in the seafood industry. These interests cannot be expected to share their benefits without

fair consideration and compensation. Any attempt to alter the economic structure of the industry for the purpose of increasing benefits to Alaskans must be done in cooperation with our neighbors from the state of Washington. And, one of the most promising opportunities for such cooperation is in the development of an educational and training program for Alaskans who wish to participate in the seafood industry.

Potential benefits to seafood businesses located in the state of Washington and operating in the waters off Alaska would include the following.

1. Availability of a trained work force with the cost of training paid for by the State of Alaska.

2. Decrease in transportation and housing costs for employees imported from out side of Alaska.

3. Decrease in employee turn over due to employment of people resident to the area of employment who are acclimated to the circumstances of the northern environment.

4. Greater productivity of workers due to training and education.

Industry's need for a trained work force and the implied opportunity for Alaskans is contained in the following two excerpts from the Alaska Department of Labor report on nonresidents working in Alaska.

> Sixty percent of employers contacted in a Department of Labor survey said their industries hire nonresidents because available Alaskans lack required training or experience.
>
> Thirty-five percent of employers contacted stated that their industries hire nonresidents because there are no Alaskans available. This reason was most commonly cited by employers in food processing.

EDUCATION AND TRAINING

The Present System:

Before addressing the specifics of a new program a few comments about the state's existing fisheries educational programs are in order. And again, the 1983 Fisheries Policy Task Force Report is a good place to start. The report contains the following statements regarding fisheries education in the state of Alaska.

> While the University of Alaska has fisheries programs of various types, including Sea Grant, fisheries technology and fisheries biology, it is the overall assessment of the Task Force that Alaska's state university is not fully addressing the academic and technical aspects of the State's largest industry.
>
> There appears to be an inadequate variety of programs offered by the University. For example, one can learn how to mend nets through the University system, but you cannot learn how to become a business or plant manager in Alaska's largest industry. The educational and research roles have been filled primarily by the University of Washington and other institutions to the South. Because of this, the Alaska industry often finds itself defenseless when competing for resource allocations with our southern neighbors.

We have neither the academic, technological or research capabilities to compete at this point. This is emphasized by a recent report which showed that 70 percent of the income of the fishermen of the State of Washington is derived from Alaskan waters.

The Task force recommends that the University offer a greater variety of programs on the academic, technological, research and applied levels in the form of a curriculum that integrates the disciplines of scientific biological research, fishery management and business management programs specifically directed at the seafood industry. The Task Force would like to see more economic analysis of fisheries, more science and technology, and more fisheries industry management emphasis.

England, Norway, Iceland and Japan have extensive educational and research and development programs that make information and training available to members of the industry for a nominal expenditure. Today, the majority of Sea Grant monies nationwide is committed to the University of Washington. More of these monies should be directed at developing the fisheries of the North Pacific by providing additional training, information and research.

Existing training along with research and development programs need to be coordinated and expanded throughout the state university and community college system. Such programs need to be coordinated with the Alaska Fisheries Development Foundation, the National Marine Fisheries Service, and the proposed Fisheries Technology Center in Kodiak.

Training and research and development programs need to be developed, funded and implemented as soon as possible. Special attention should be paid to increase funding of the Fisheries Industrial Technology Center as soon as possible. The University should make a concerted effort to win a larger share of the Sea Grant monies distributed nationally.

Goals for a New System of Fisheries Education in Alaska:

The primary goal of the state's fishery education program should be to equip Alaskans with the employment and entrepreneurial skills necessary to fulfill the present and future needs of the state's seafood industry.

Such skills will require both vocational and academic programs. Examples of some existing employment opportunities are as follows.

1. Trawler vessel captains to replace Koreans recently employed by U. S. vessel owners in violation of U.S. law. It is possible that a program to prepare Alaskans for training in the fishing schools of other countries might fill this need.

2. Trained technicians to maintain and repair the modern fish processing machinery that are being employed in the bottomfish and surimi operations. This machinery includes German manufactured gutting, skinning and filleting machines as well as Japanese manufactured computers that control the operations of surimi processing equipment. And there is also the existing canned salmon processing equipment to be cared for.

3. Seafood quality control technicians.

4. Office managers, administrators, plant supervisors and processing workers both on shore and on factory trawlers and floating processors.

5. Commercial fishermen trained for service on high seas trawling and longlining vessels.

6. Refrigeration technicians capable of installing and maintaining equipment both on shore and on floating processors and fishing vessels.

In addition to the foregoing, most of the state's existing fishermen would benefit from comprehensive training in business management including record keeping, accounting, cash flow management, risk management, quality control and marketing. Don't forget the statistic from the CFEC that suggests Alaskans are less productive as a group than nonresidents.

The secondary goal should be the creation of a research and analysis capability in fishery economics for the purpose of developing and promoting the state's interest in fishery resource allocation and utilization. This need was previously referred to in the following excerpt from the Fishery Policy Task Force Report to Governor Sheffield.

> The educational and research roles have been filled primarily by the University of Washington and other institutions to the South. Because of this, the Alaska industry often finds itself defenseless when competing for resource allocations with our southern neighbors.

A third goal should be the development of a research and development capability in the area of food processing, food technology and aquaculture. One institution that serves by example to demonstrate the potential of this goal is the University of California at Davis and its activities in the

field of agriculture. The importance of the seafood industry and its contribution to the Alaskan economy is certainly comparable in kind if not in magnitude to California's agriculture industry.

Goal Development and Implementation:

The previous section described a program whose primary and fundamental purpose is to create economic benefits for Alaskans from the utilization of fishery resources. It is a purpose that expresses itself in the practical applications of education and research. It is not an academic activity. It is not a program that should be driven by academic goals or by academicians. Rather, it is a program that should be driven by the industry that generates the benefits, and thereby serves the interests of Alaskans.

If the foregoing proposition can be accepted by state government officials and industry leaders, then the problem of organization becomes primarily a problem of defining educational goals in terms of industry needs and market opportunities. Such a process should begin with representatives of the seafood industry participating in an effort to identify the means by which an educational program could serve their needs and thereby achieve the program goals.

In regard to vocational and training needs, the industry should identify and define those job skills that it presently requires and those that will be developing in the future. Furthermore, industry should make the commitment to provide employment opportunities for persons completing the specified courses of study and training.

In regard to the need for research in the area of economic development, the disciplines of economics and biology should be utilized to develop an economic model and strategy that serves to redefine the state's role in fishery utilization from one of a resource colony to one of increased industrial and commercial activity within the state.

In regard to the need for research and development in seafood processing, seafood technology and aquaculture; representatives of the seafood industry should identify development needs based on market opportunities. Programs should then be developed to fill those needs.

Only after the preceding goals have been defined and accepted by government and industry can the process of program development be initiated.

Program Development:

The development of a seafood industry educational and vocational program in Alaska is the proper function of all government agencies responsible for education within the state, including the secondary, vocational and academic sectors. And, a comprehensive program to address the needs of industry can only be created through the cooperative efforts of all the educational administrators and educators who exist throughout the many levels of state and local government.

Preceding sections of this paper have included quotations that criticize existing programs for a variety of failures. Those quotations also contain a number of recommendations for the development, implementation, coordination and expansion of programs. However only after industry has defined the needs, purposes and goals to be served by a seafood education program, then and only then, should government begin the process of program development.

Undoubtedly, much can then be achieved through a reorganization of existing programs and resources. And, much can undoubtedly be achieved through a coordination of existing programs. However optimum efficiency and program productivity will be difficult to achieve if fishery educational programs continue to be spread in a fragmented fashion throughout a multitude of government jurisdictions. Such fragmentation can

only serve to dilute resources, diffuse responsibility, and ultimately defeat the purpose of the program. In order to maintain the link wit private industry that is fundamental to its purpose, a seafood industry educational program must have an identity of its own. It must have an identity and an existence that is manifest in an institution or an agency with clearly defined responsibilities and the authority to respond to the advice, recommendations and requests of industry.

RECOMMENDED PLAN OF ACTION

The following actions are recommended as a plan of action for creating a seafood industry education program in Alaska.

1. Invite representatives of the seafood industry to participate in a meeting for the purpose of defining industry needs that can be satisfied through an educational program, and organizing a Seafood Industry Educational Development Council.

2. Request the House Research Agency to conduct a study of the seafood industry educational programs of other major fishing nations of the world, including Norway, Great Britain, Canada, and Japa . The study should include examinations of the programs purposes, structure and content as well as their record of accomplishments.

3. Request the House Research Agency to conduct a study of the manner in which the land grant colleges of the nation have served the needs of the agriculture industry, and compare that with the conduct of the Sea Grant program. Include an analysis of the Sea Grant program's relationship to the seafood industry both on a national and an Alaskan basis.

4. After completion of the foregoing, hold a symposium for the purpose of defining an action plan for the development of an industry driven seafood education program in Alaska. The symposium should be attended by representatives of the many organizations and interests in the seafood industry as well as representatives of the University of Alaska, the Department of Education, the secondary schools of the state, the Department of Labor and the Department of Commerce and Economic Development. The symposium should be hosted either by the Governor's Office or by a legislative entity so as to ensure that no educational institution or agency is permitted to dominate the program development process in a self serving manner.