



Fisheries Management

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FISHERIES MANAGEMENT

A photograph of a salmon leaping from the water, creating a splash. The fish is in mid-air, with its body arched and its tail just leaving the water. The background is a deep blue, textured surface of water with ripples and a large rock visible in the lower right.

Monitoring

Ocean Abundance Forecast

Management

Conservation

Fisheries

Tribal/Non-Tribal

Inter-Tribal

Fish change form

Human capture

Fish enter rivers and head for spawning areas

Salmon processing plant

To hatchery

In the fall spawning salmon deposit eggs in gravel nests and die

Grow to maturity in Pacific Ocean in 1-2 years

Modified Life Cycle

Eggs are taken from adult females and fertilized with sperm "milked" from males

Normal Life Cycle

Fry hatch in the spring . . .

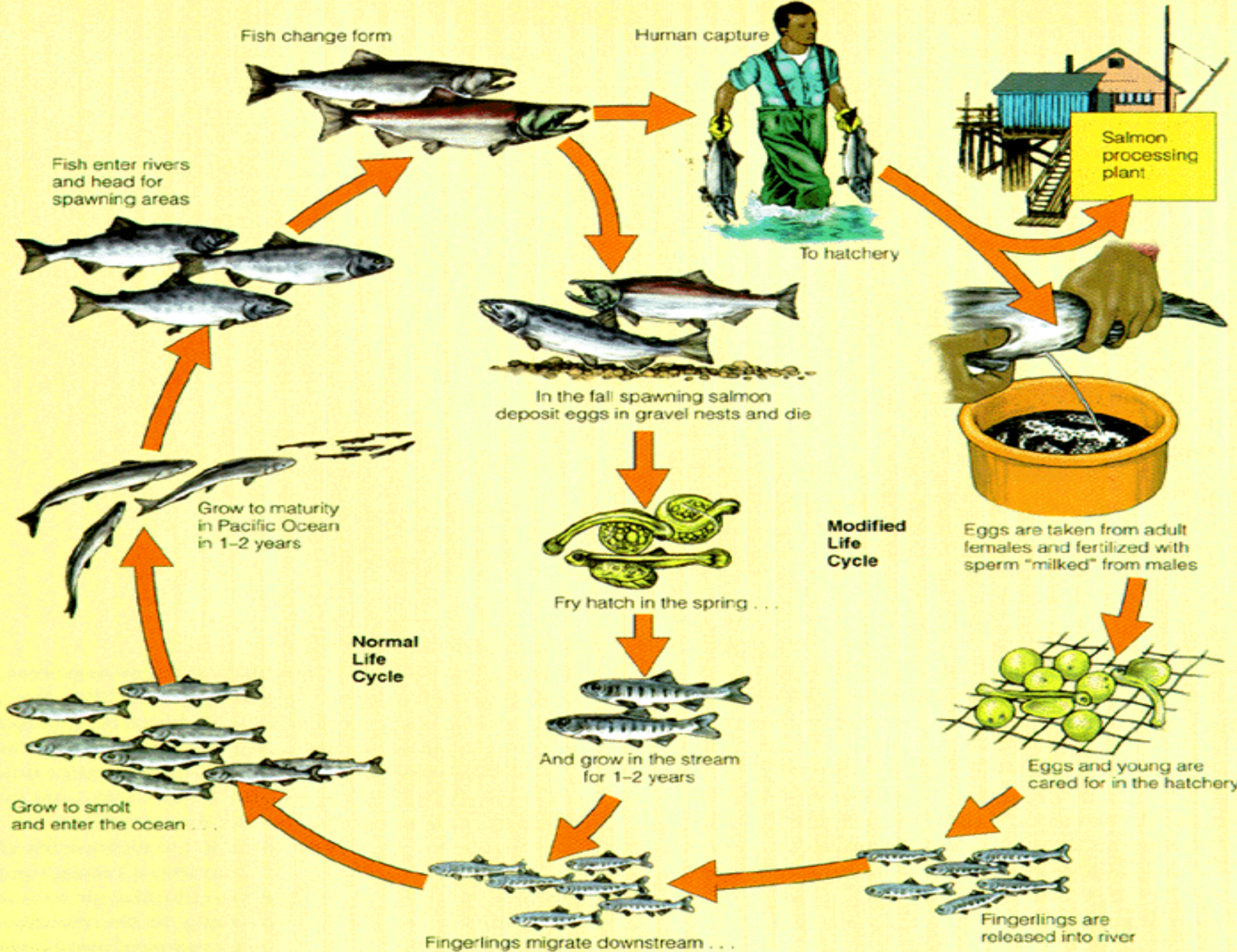
And grow in the stream for 1-2 years

Eggs and young are cared for in the hatchery

Grow to smolt and enter the ocean . . .

Fingerlings are released into river

Fingerlings migrate downstream . . .



Fisheries Management Monitoring



Harvest
Natural Spawners
Hatchery Escapement

Fisheries Management Ocean Harvest Monitoring



Fisheries Management River Recreational Harvest Monitoring

- Klamath River Creel Survey
- Lower Trinity River Creel Survey
- Willow Creek Weir Tag Recovery



Fisheries Management Tribal Harvest Monitoring

- Net Count
 - 4/7, One Area, May-March
- Interview Fishers
- Biological Samples for Age and Hatchery Contribution
- Estimation of Total Harvest by Species



Fisheries Management Monitoring

- **Spawning escapement**
 - Natural area spawning
 - Trinity River Hatchery returns
- **Upper Trinity River recreational harvest**



Fisheries Management Monitoring Spawners

Annual multi-agency
Effort to Count
Chinook Spawners in
Natural Areas



Biological Data
Used for Stock-Size
Projections in
Following Spring



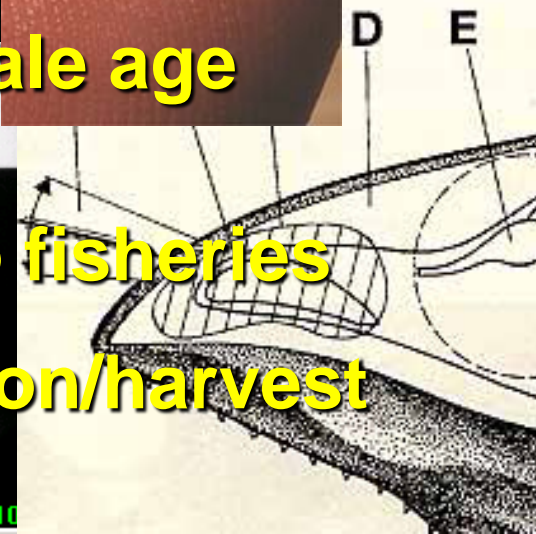
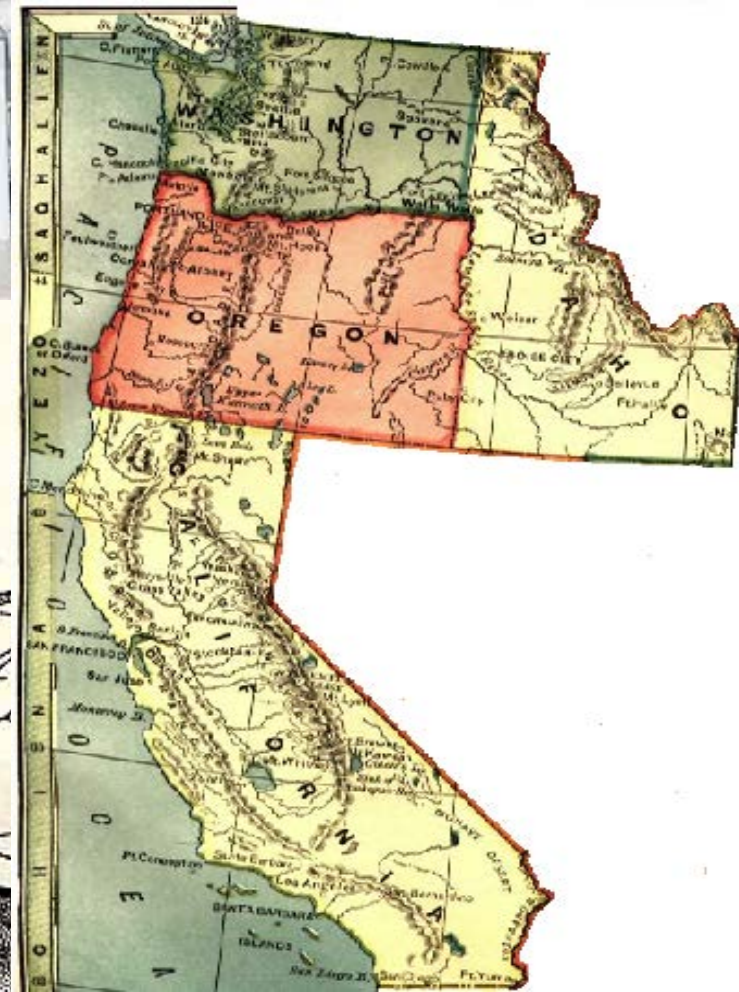
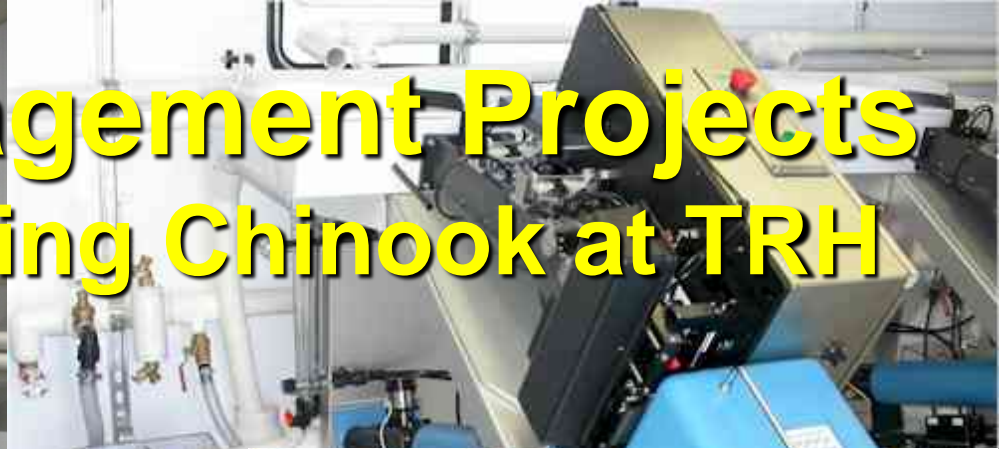
Fisheries Management Monitoring Trinity River Hatchery

- Biological Sampling at TRH
- Coded-Wire-Tag Recovery
- Scale Collection--Ageing



Fisheries Management Projects

Coded-Wire Tagging Chinook at TRH



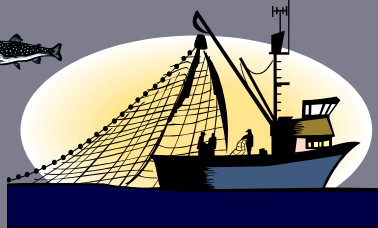
- Validation of scale age analysis
- Contributions to fisheries
- Ocean distribution/harvest model

Ocean Fisheries

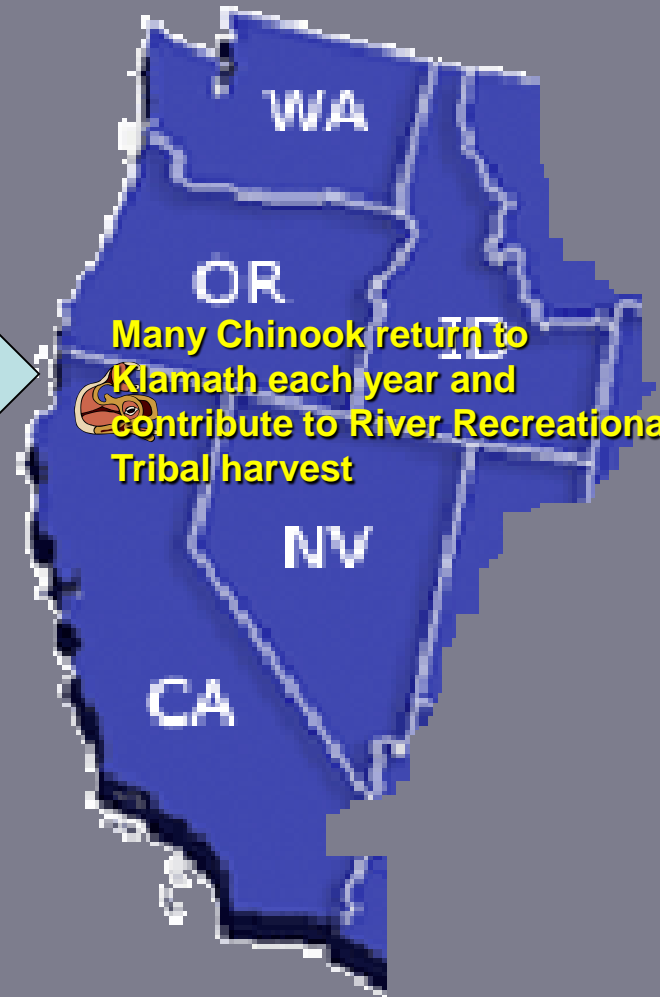
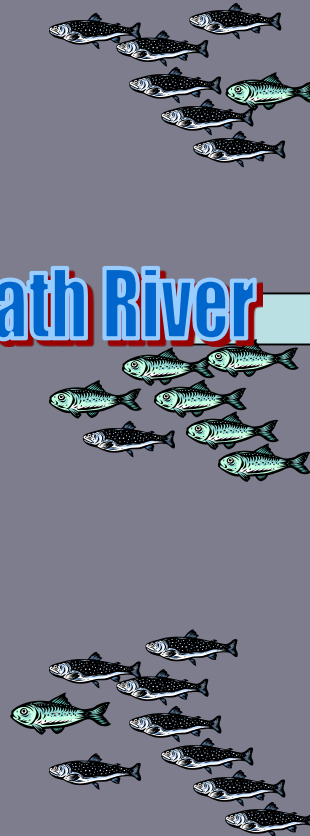
Klamath Chinook are
Caught in Mixed-Stock
Ocean Fisheries

Klamath Chinook → 

Other Chinook → 



Klamath River →



Many Chinook return to
Klamath each year and
contribute to River Recreational
Tribal harvest

Fisheries Management Projects

Scale Ageing

- Fall Chinook Return at Ages 2, 3, 4, and 5
- Ocean Population Forecast
- Cohort Reconstruction

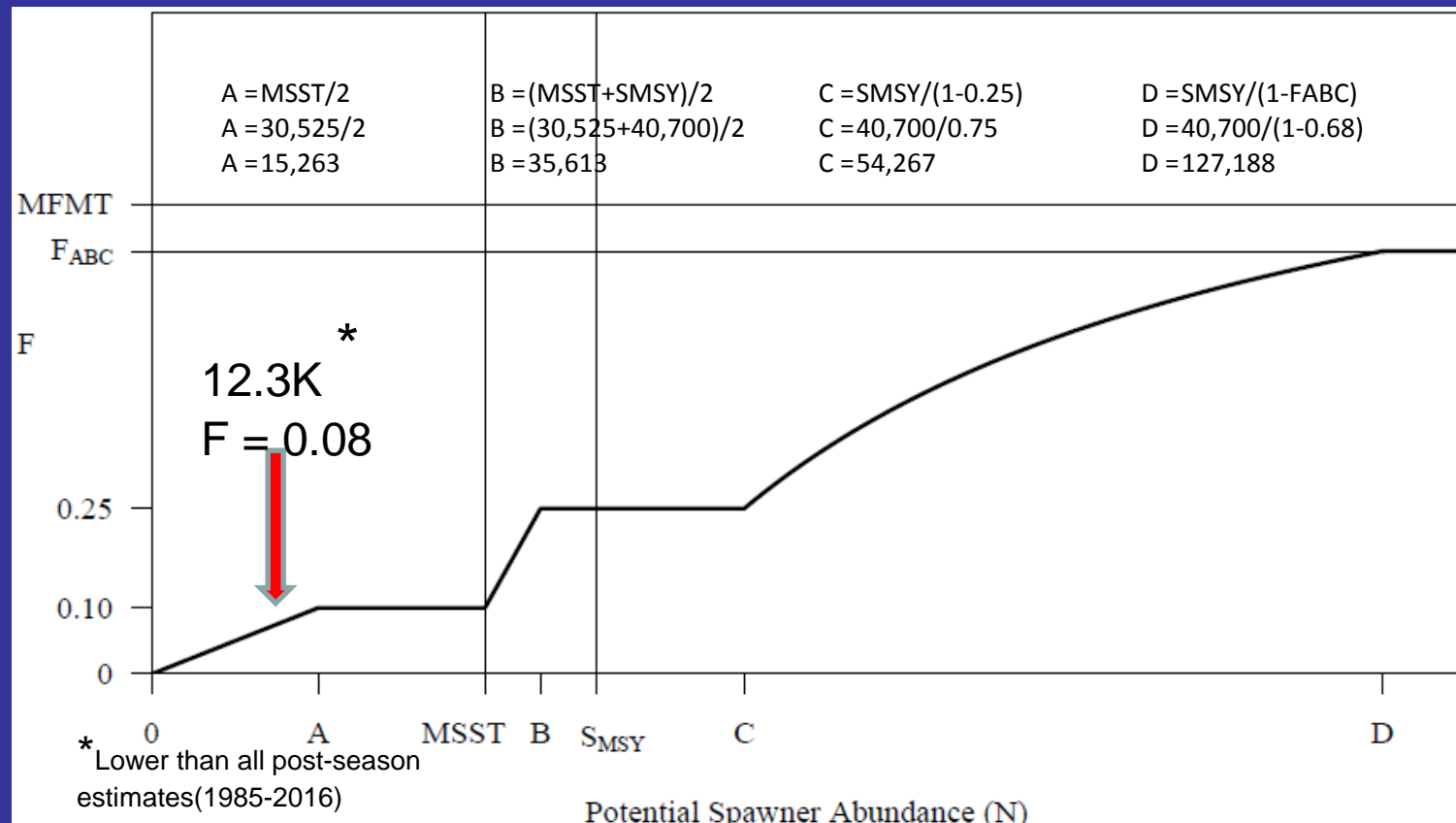


Fisheries Management

2017 PFMCM OBJECTIVES

Control rule for Klamath River fall Chinook.

Abundance is pre-fishery ocean abundance in spawner equivalent units, and F is the exploitation rate.



Fisheries Management

2017 PFMCM OBJECTIVES

- Klamath Fall Chinook Natural Escapement of 11,400
- Allocate 50% of Non-Tribal *de minimis* harvest to Ocean Troll, Ocean Recreational, and River Recreational Fisheries
- Reserve 50% of *de minimis* harvest for Yurok and Hoopa Valley Tribes

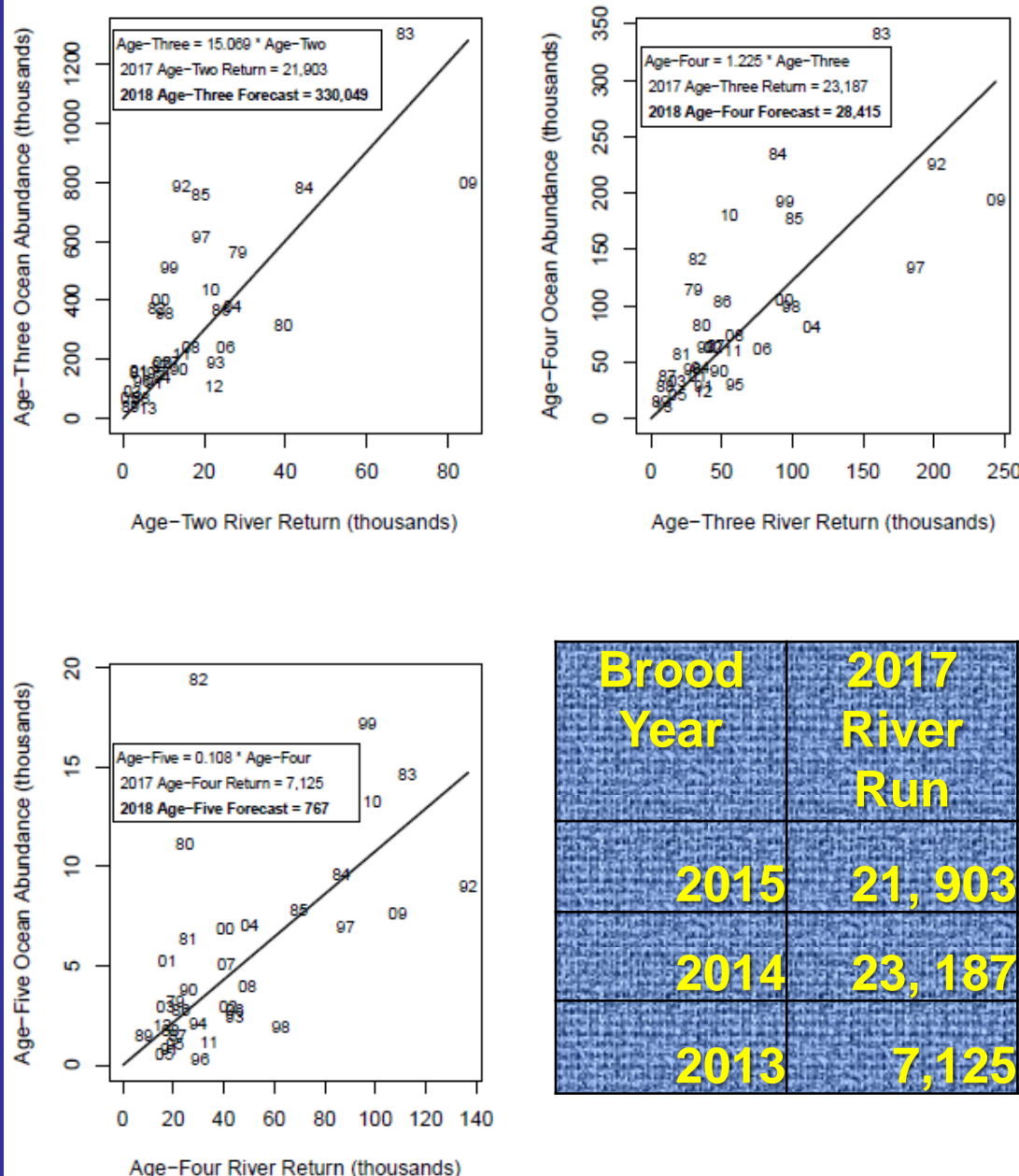
Table 5. Age composition of the 2017 Klamath Basin fall Chinook run.

2/14/2018

Escapement & Harvest	2	3	AGE 4	5	Total Adults	Total Run
Hatchery Spawners						
Iron Gate Hatchery (IGH)	3,193	5,800	1,620	23	7,443	10,636
Trinity River Hatchery (TRH)	1,863	3,487	244	39	3,770	5,633
Hatchery Spawner subtotal	5,056	9,287	1,864	62	11,213	16,269
Natural Spawners						
Salmon River Basin	327	724	495	119	1,338	1,665
Scott River Basin	307	1,933	79	257	2,269	2,576
Shasta River Basin	6,618	782	2,022	483	3,287	9,905
Bogus Creek Basin	848	1,565	274	35	1,874	2,722
Klamath River mainstem (IGH to Shasta R)	1,735	2,379	560	66	3,005	4,740
Klamath River mainstem (Shasta R to Indian Cr)	587	728	169	20	917	1,504
Klamath Tributaries (above Trinity River)	154	527	299	176	1,002	1,156
Blue Creek	45	23	117	0	140	185
Klamath Basin subtotal	10,621	8,661	4,015	1,156	13,832	24,453
Trinity River (mainstem above WCW)	5,586	3,642	620	170	4,432	10,018
Trinity River (mainstem below WCW)	129	84	14	4	102	231
Trinity Tributaries (above Reservation; below WCW)	96	63	10	3	76	172
Hoopa Reservation tributaries	90	59	11	2	72	162
Trinity Basin subtotal	5,901	3,848	655	179	4,682	10,583
Natural Spawners subtotal	16,522	12,509	4,670	1,335	18,514	35,036
Total Spawner Escapement	21,578	21,796	6,534	1,397	29,727	51,305
Recreational Harvest						
Klamath River (below Hwy 101 bridge)	26	16	27	4	47	73
Klamath River (Hwy 101 to Weitchpec)	10	6	10	1	17	27
Klamath River (Weitchpec to IGH)	0	0	0	0	0	0
Trinity River Basin (above WCW)	0	0	0	0	0	0
Trinity River Basin (below WCW)	6	1	6	0	7	13
Subtotals	42	23	43	5	71	113
Tribal Harvest						
Klamath River (below Hwy 101)	65	152	51	2	205	270
Klamath River (Hwy 101 to Trinity mouth)	7	4	7	0	11	18
Trinity River (net and hook-and-line)	112	1,096	445	112	1,653	1,765
Trinity River (harvest weir)	82	7	0	0	7	89
Subtotals	266	1,259	503	114	1,876	2,142
Total Harvest	308	1,282	546	119	1,947	2,255
Totals						
Harvest and Escapement	21,886	23,078	7,080	1,516	31,674	53,560
Recreational Angling Dropoff Mortality 2.04%	1	0	1	0	1	2
Tribal Net Dropoff Mortality 8.7%	16	109	44	10	163	179
Klamath-Trinity Basin Ich disease testing	0	0	0	0	0	0
Total River Run	21,903	23,187	7,125	1,526	31,838	53,741

2017 River Return Klamath Fall Chinook

Fisheries Management Ocean Population Forecast Klamath Fall Chinook



Brood Year	2017 River Run	2018 Ocean Pop.
2015	21,903	330,049
2014	23,187	28,415
2013	7,125	767

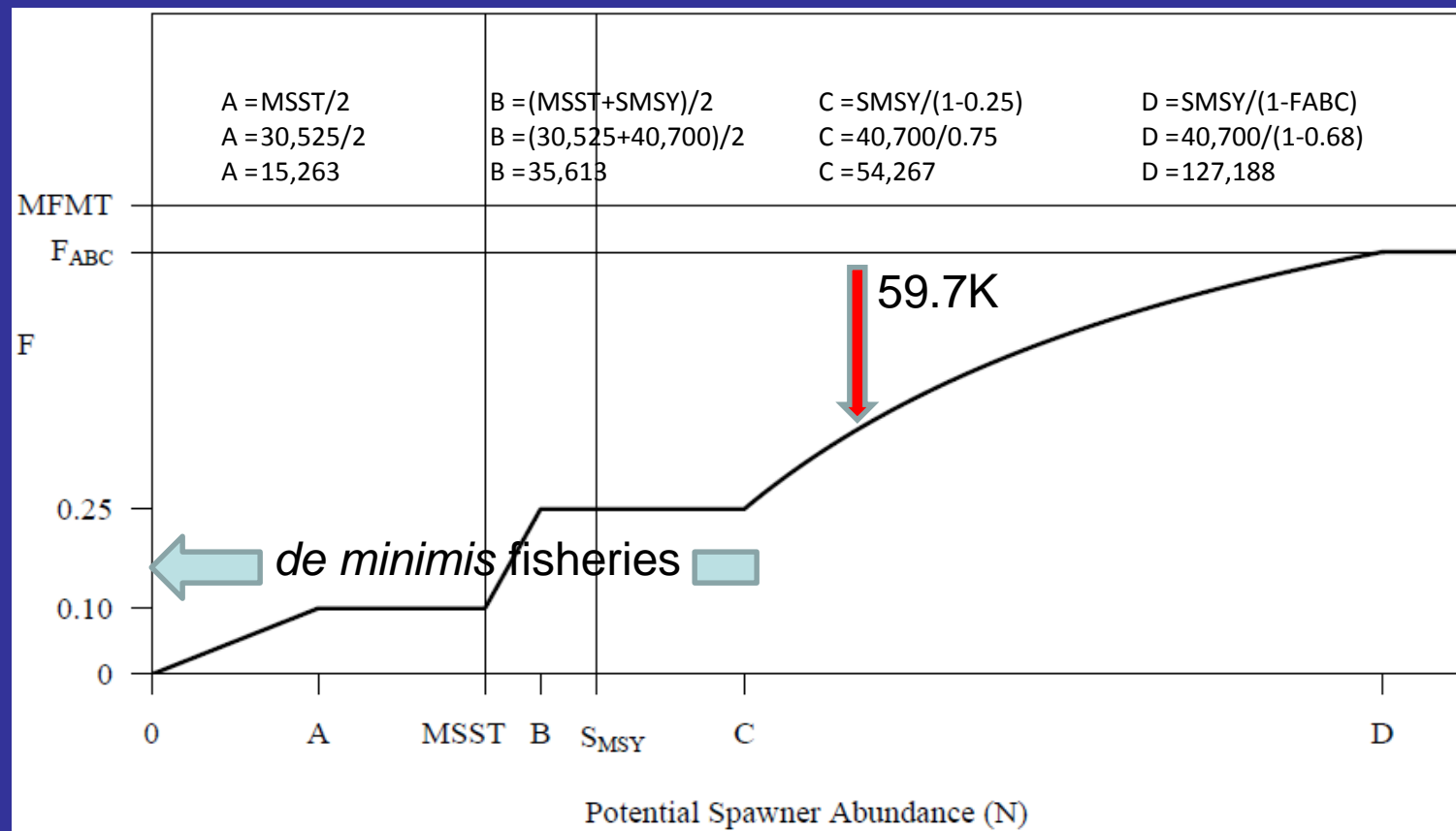
Figure 1. Regression estimators for Klamath River fall chinook ocean abundance (Sept. 1) based on that year's river return of same cohort. Numbers in plots denote brood years.

Fisheries Management

2018 PFMCM OBJECTIVES

Control rule for Klamath River fall Chinook.

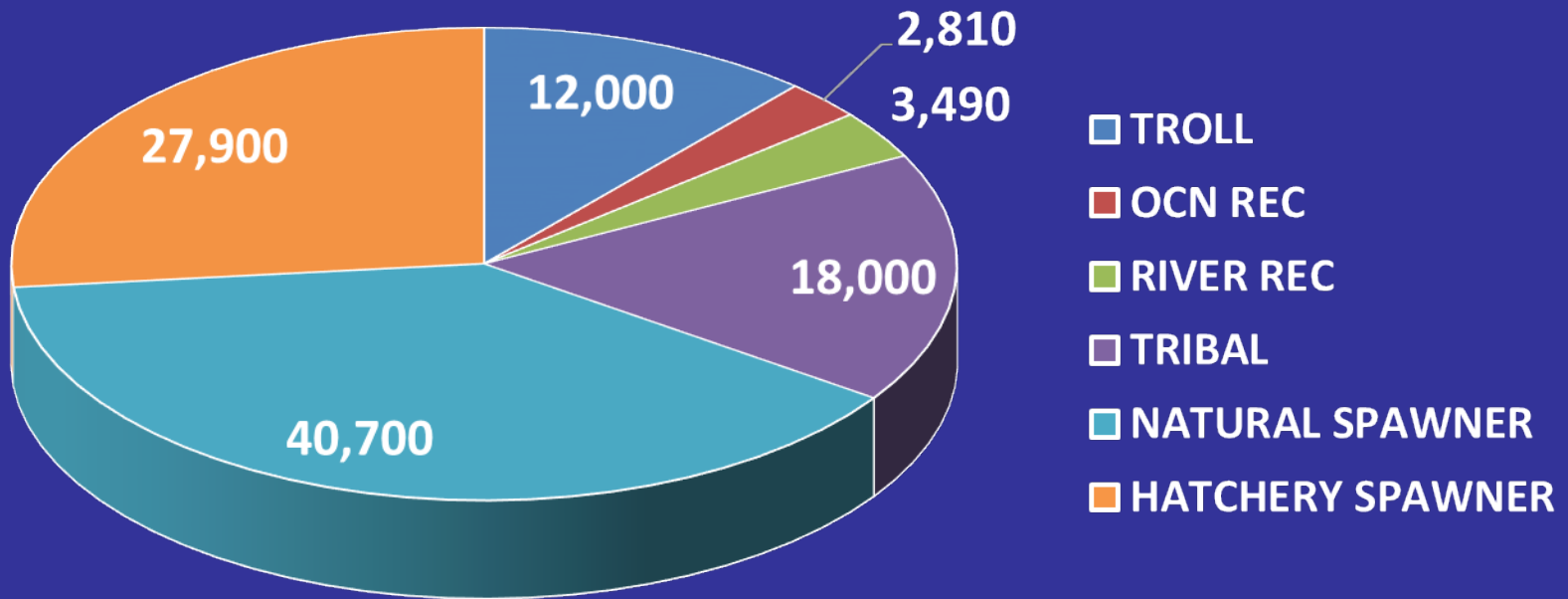
Abundance is pre-fishery ocean abundance in spawner equivalent units, and F is the exploitation rate.



Fisheries Management 2018 PFMC OBJECTIVES

- Klamath Fall Chinook Natural Escapement of 40,700
- Allocate 50% of harvestable surplus to Non-Tribal Ocean Troll, Ocean Recreational, and River Recreational Fisheries
- Reserve 50% of harvestable surplus for Yurok and Hoopa Valley Tribes

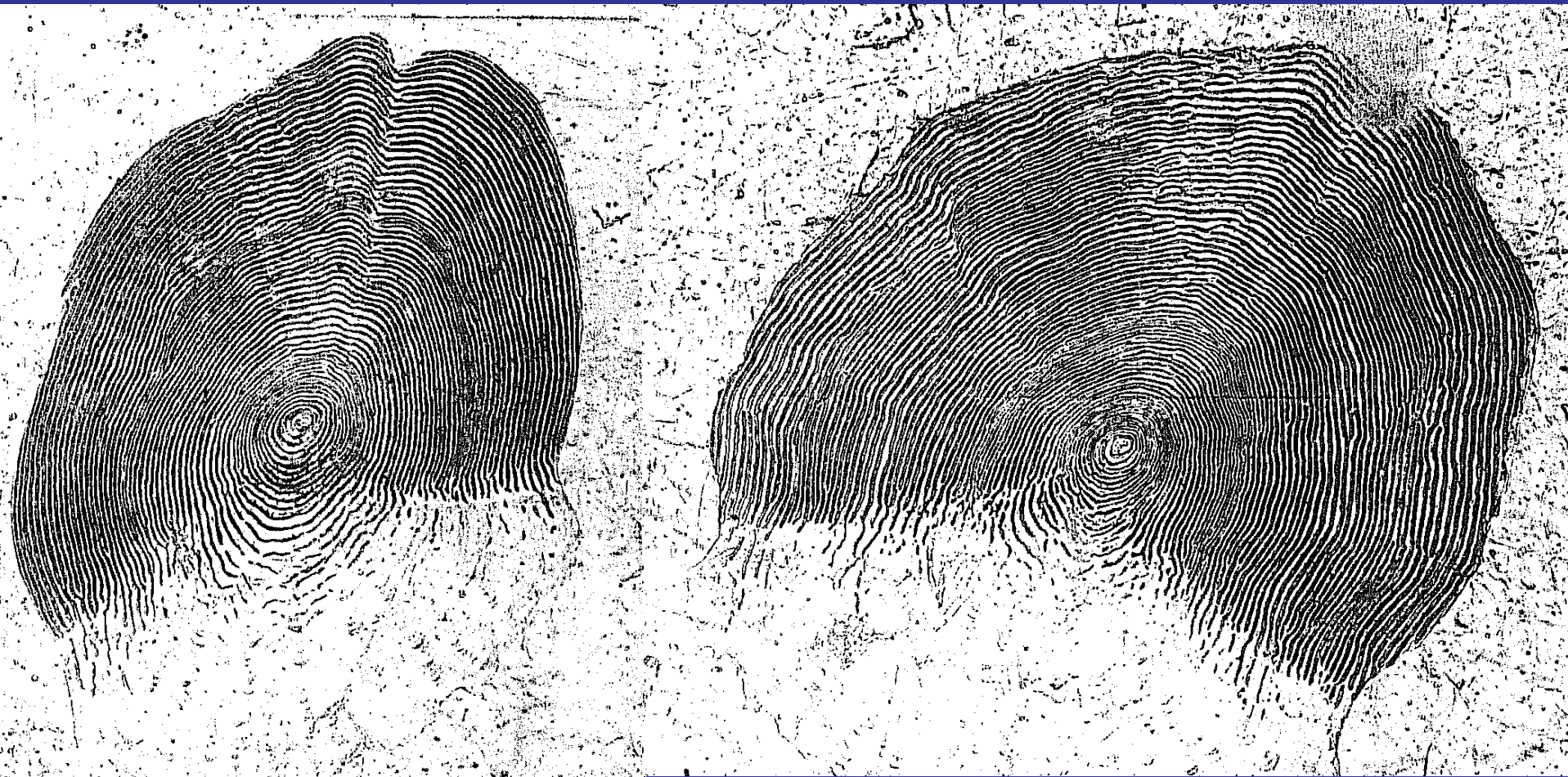
Conservation & Harvest



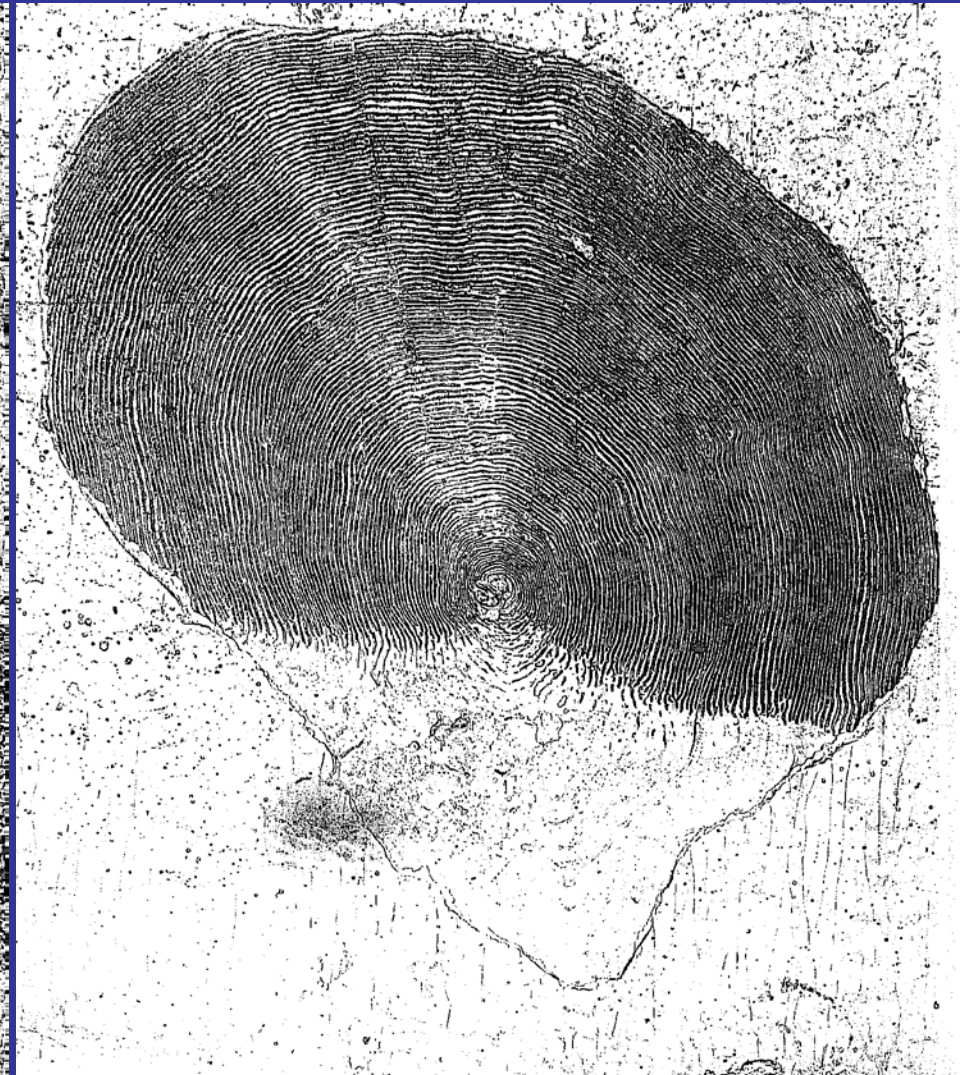
A photograph of a salmon in mid-leap, jumping out of the water. The fish is silver with a pinkish-red tint, and its body is arched. It is positioned above a large, dark rock. The water is dark blue and turbulent, with white foam from the jump. The word "QUESTIONS?" is written in large, bold, yellow capital letters across the middle of the image.

QUESTIONS?

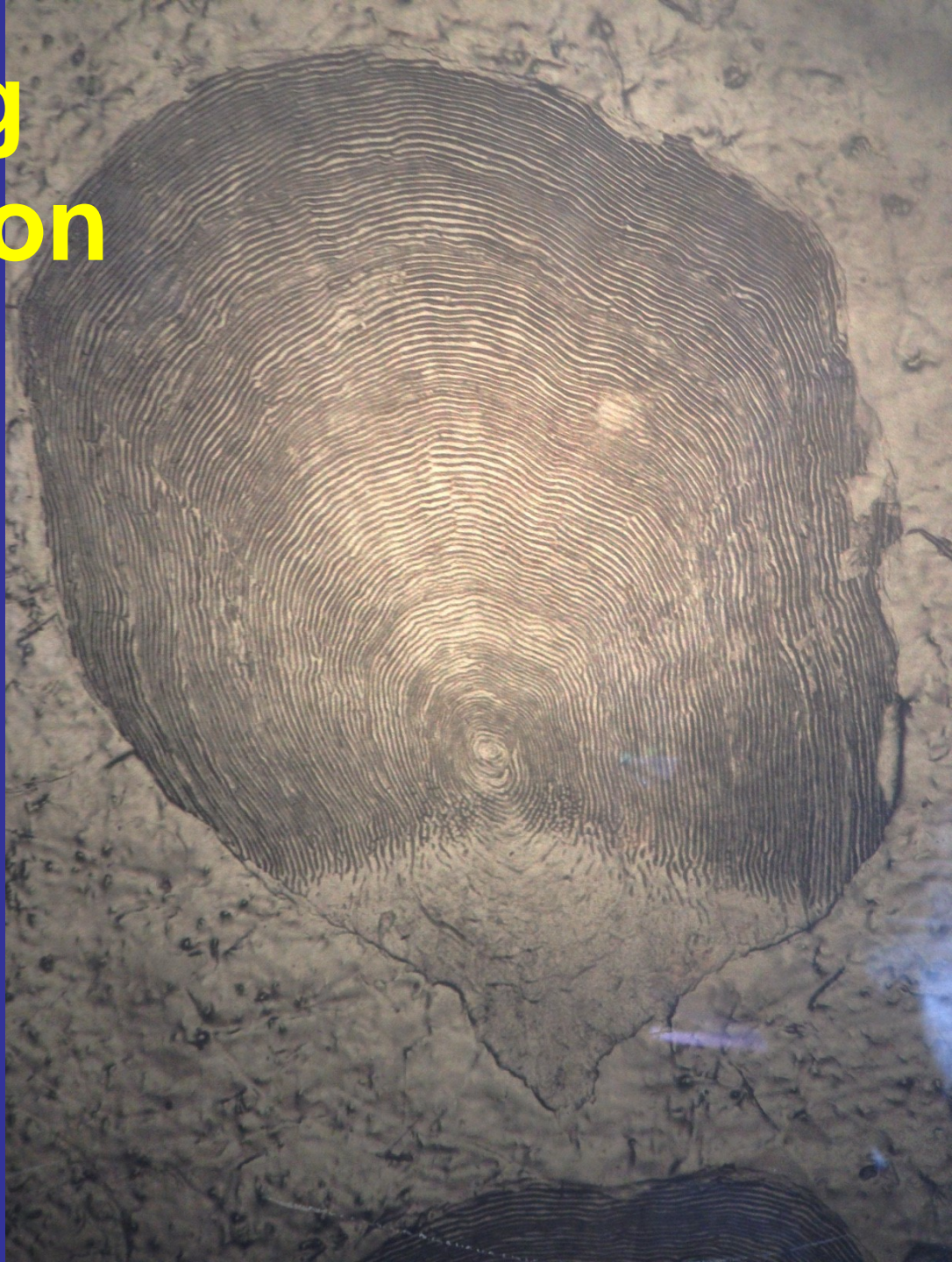
Scale Ageing Chinook Salmon



Scale Ageing Chinook Salmon



Scale Ageing Chinook Salmon

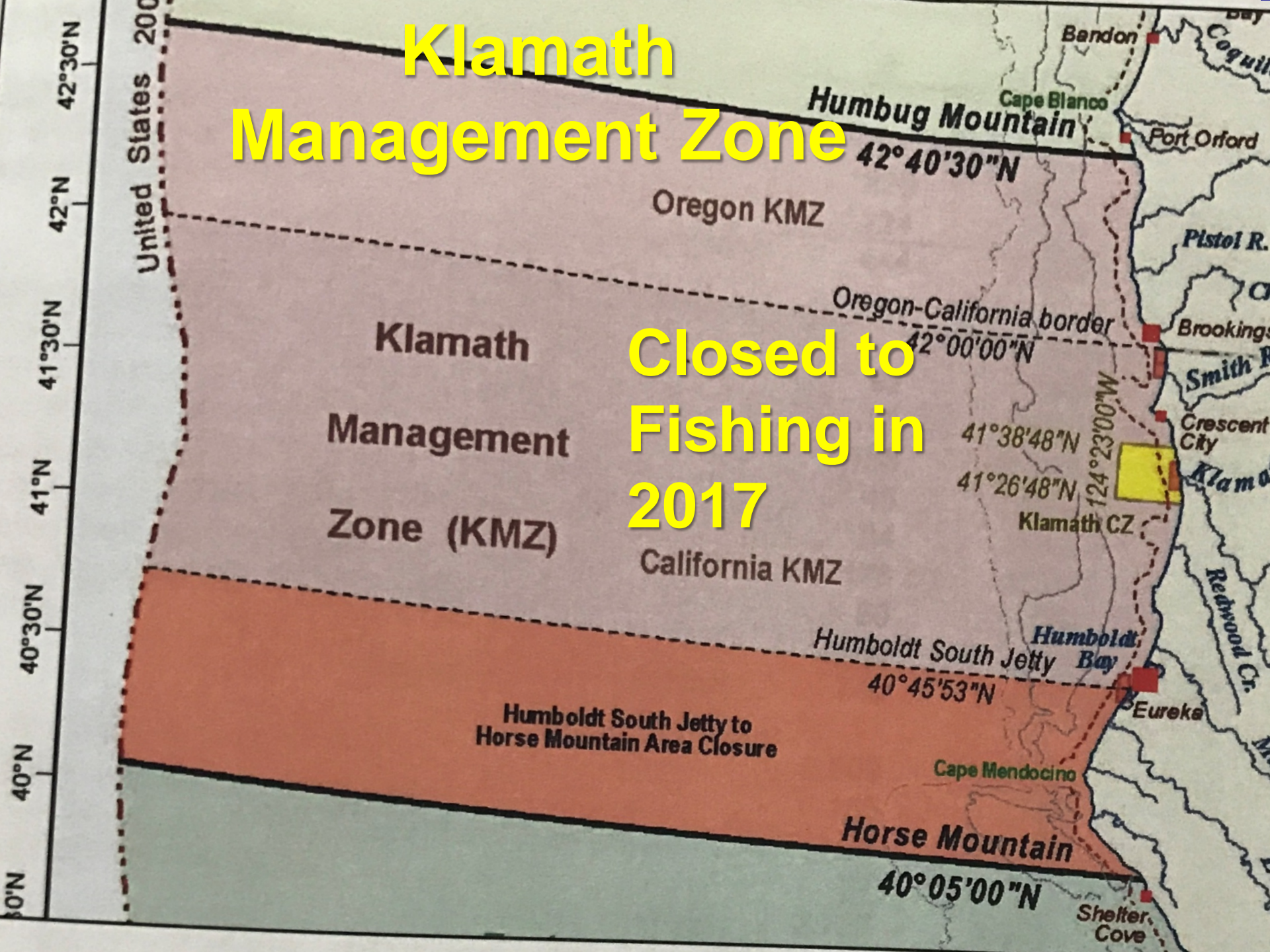


Conservation & Harvestable Surplus

- Absent fishing: 99,994
- Hatcheries: 40,261
- Natural areas: 59,733
- With fishing
- Mature adults: 92,296
- Strays: 423
- Klamath Basin: 91,873
- Spawners: 68,614
- Hatcheries: 27,915
- Natural areas: 40,700
- Reduction rate: 0.319
- Klamath Harvest
- Total: 36,243
- River: 21,612
- Ocean: 14,631
- Tribal: 18,122 0.500 (objective: 0.500)
- Non-tribal: 18,122
- River: 3,490 0.193 (objective: 0.193)
- Ocean troll: 11,818
- CA / OR: 0.747 / 0.253
- Ocean sport: 2,813

Klamath Management Zone

Closed to Fishing in 2017



Pacific Fishery Management Council (PFMC)

The Pacific Fishery Management Council is one of eight regional fishery management councils established by the Magnuson Fishery Conservation and Management Act of 1976. With jurisdiction over the 317,690 square mile exclusive economic zone off Washington, Oregon and California, the Council manages fisheries for about 119 species of salmon, groundfish, coastal pelagic species (sardines, anchovies, and mackerel), and highly migratory species (tunas, sharks, and swordfish).