OVERVIEW OF FISH PASSAGE IN THE MIDDLE FORK WILLAMETTE SUBBASIN

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Willamette and Rogue Project
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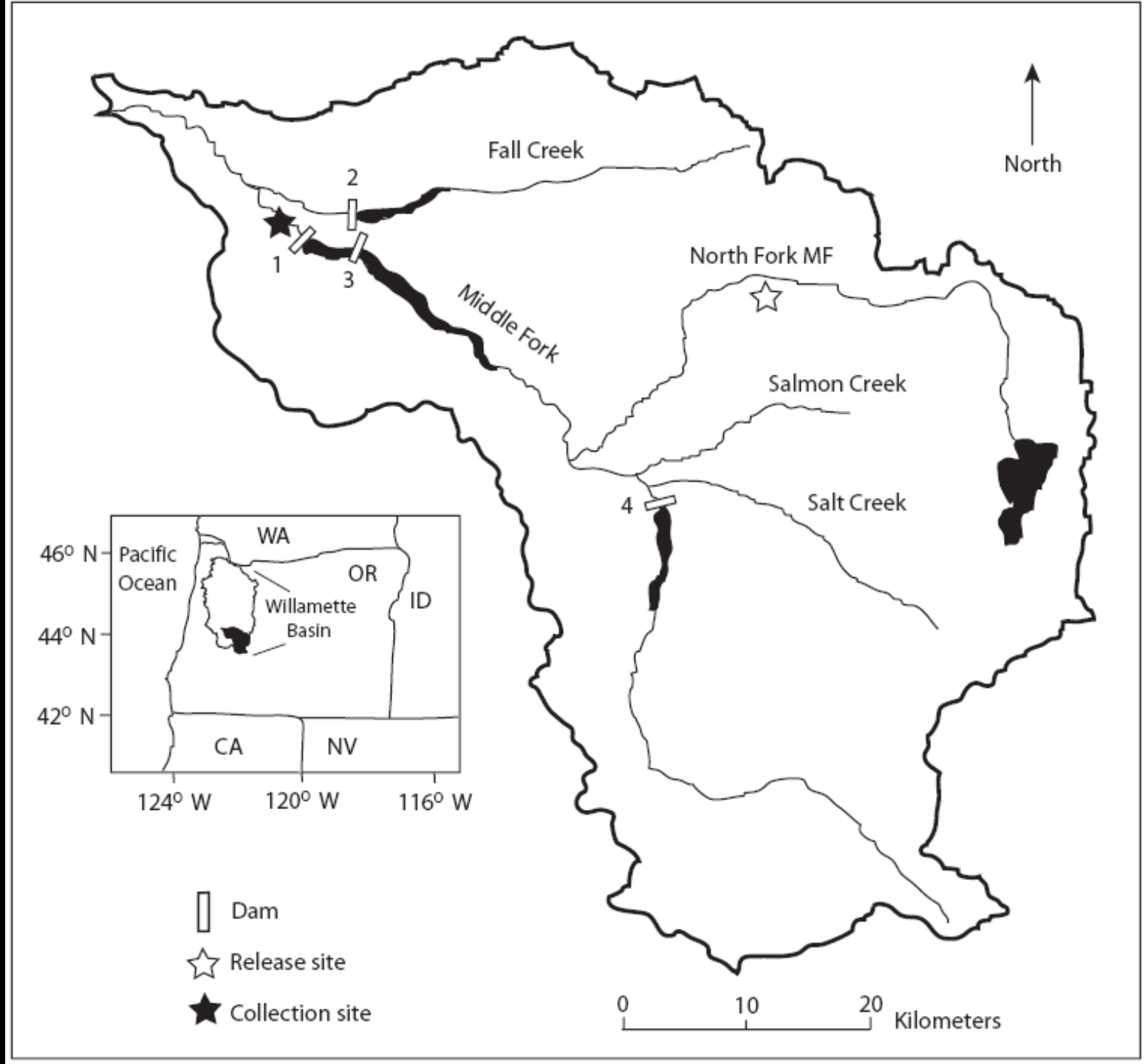
US Army Corps of Engineers ®
Portland District

U.S.ARMY


Fall Creek
North
2
1
3
North Fork MF
Middle Fork
Salmon Creek
4
Salt Creek
46° N
44° N
42° N
Pacific Ocean
WA
OR
ID
Willamette Basin
CA
NV
124° W
120° W
116° W
Dam
Release site
Collection site
0
10
20
Kilometers

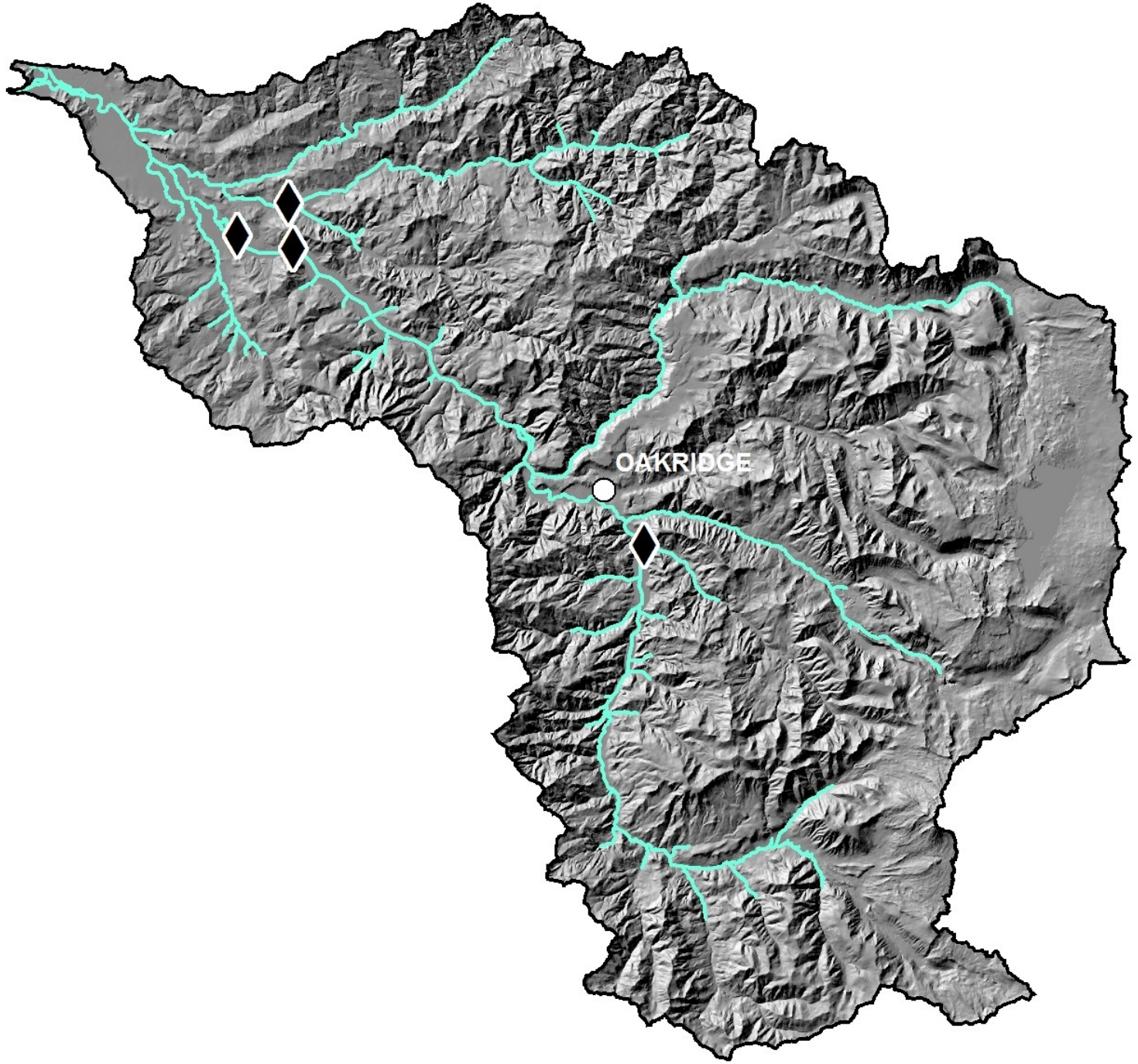
MIDDLE FORK WILLAMETTE

Historically spring Chinook run may have been largest of any subbasin

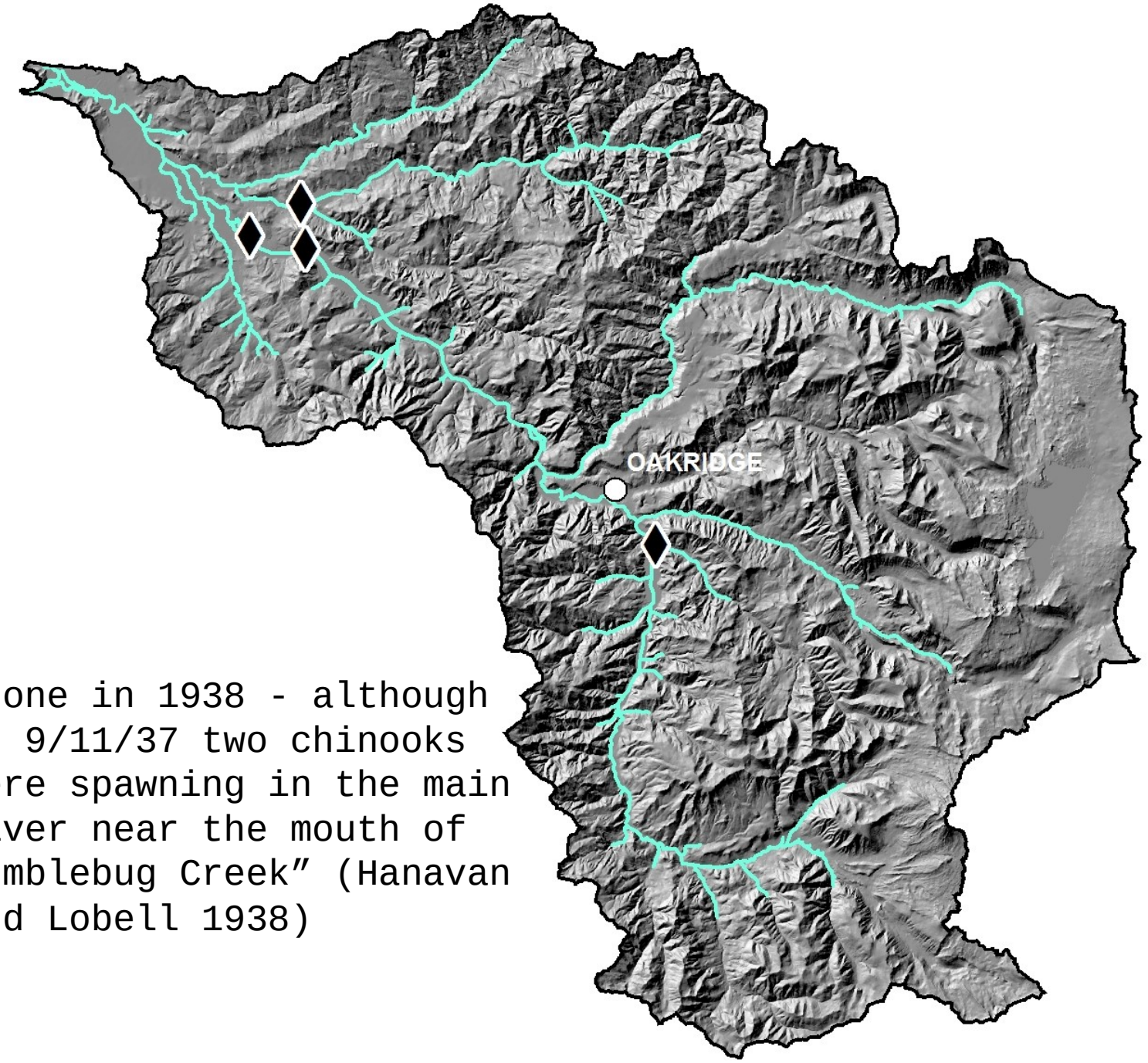
Egg take 11.3 million in 1918 (3,200 eggs / female)

- 7,100 above LOP
- Doesn't include fish spawning downstream of hatchery racks
- Intensive fishery in Lower Willamette and Columbia

Hatchery spring Chinook released since 1919

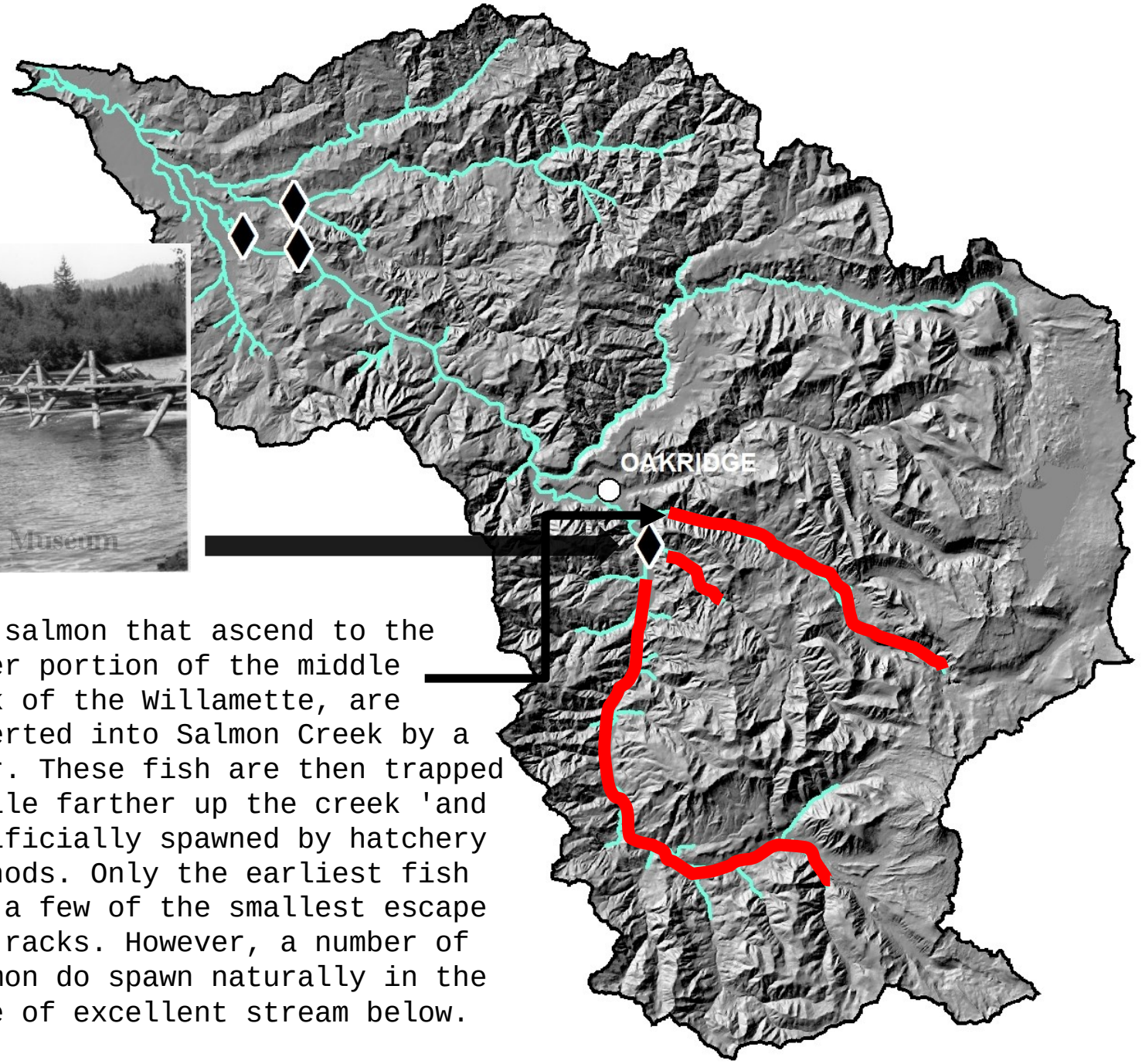

OAKRIDGE


98% of 1947 run spawned upstream of LOP
(remaining 2% above FC) (Mattson 1948)
Lane County Historical Museum

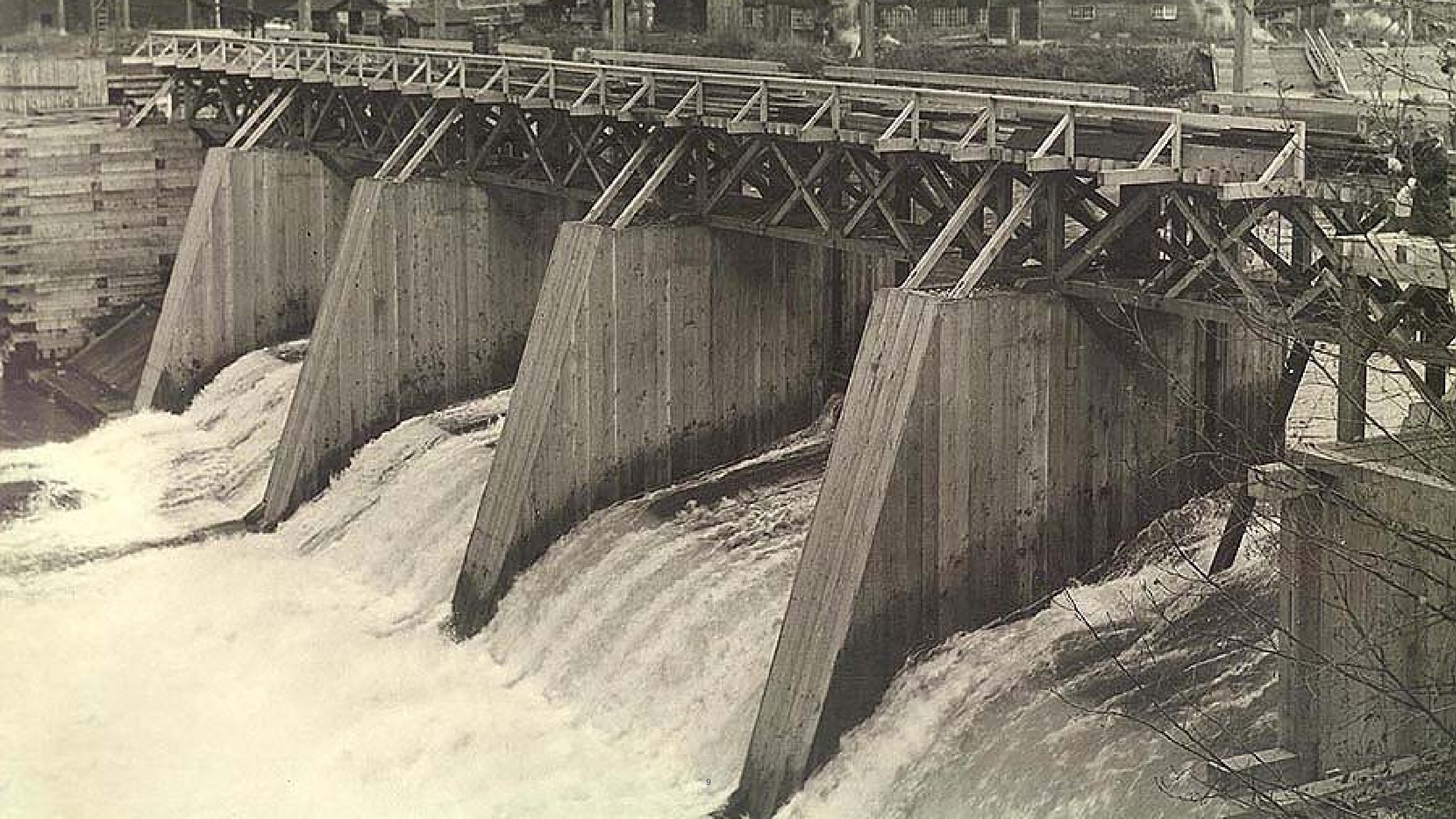


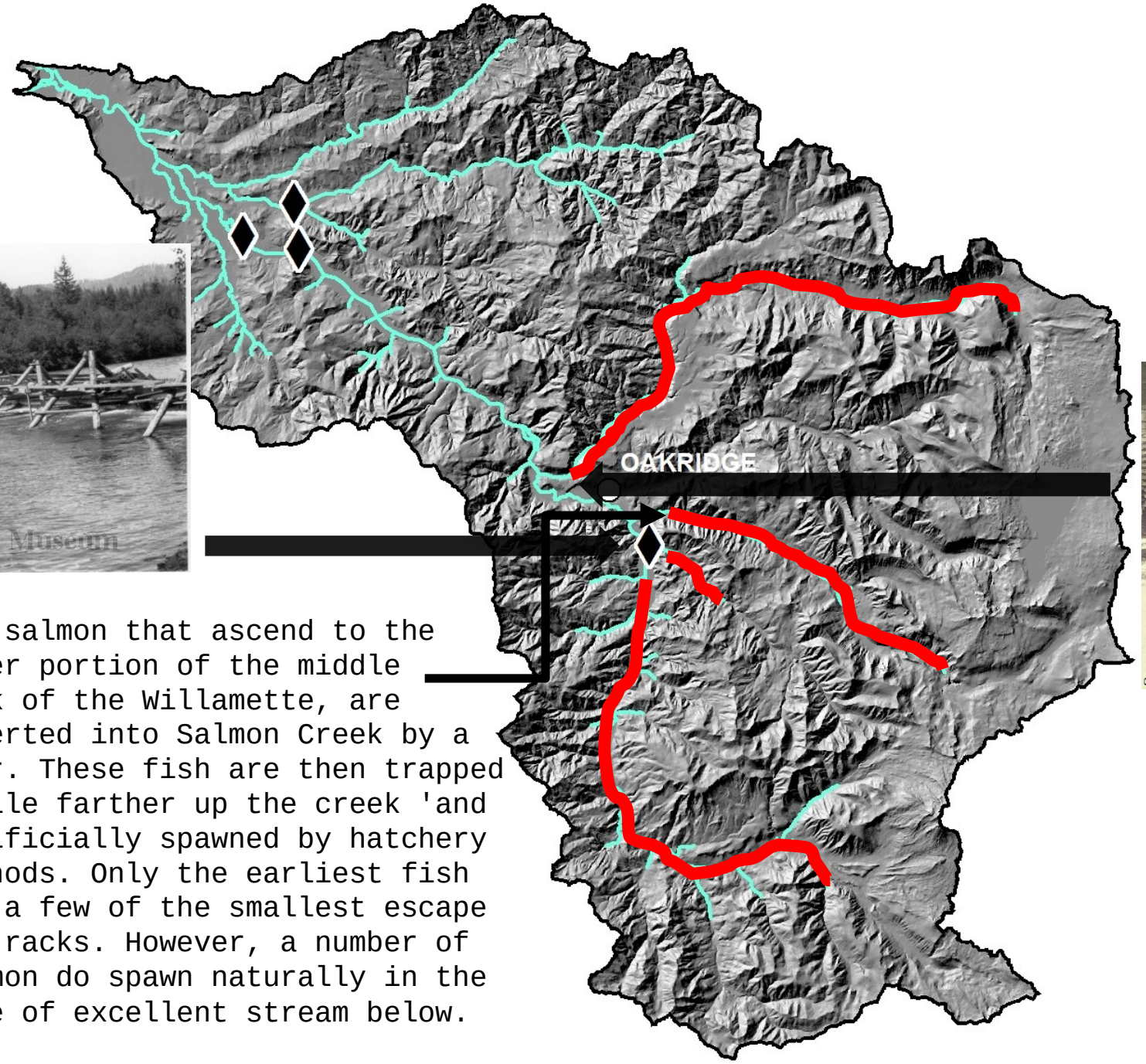
“None in 1938 - although on 9/11/37 two chinooks were spawning in the main river near the mouth of Tumblebug Creek” (Hanavan and Lobell 1938)

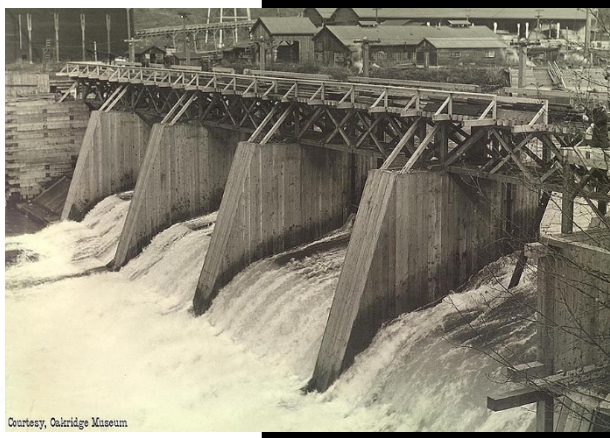

First significant changes in fish passage and distribution begin 100 years ago
Lake County Historical Museum



All salmon that ascend to the upper portion of the middle fork of the Willamette, are diverted into Salmon Creek by a weir. These fish are then trapped a mile farther up the creek 'and artificially spawned by hatchery methods. Only the earliest fish and a few of the smallest escape the racks. However, a number of salmon do spawn naturally in the mile of excellent stream below.







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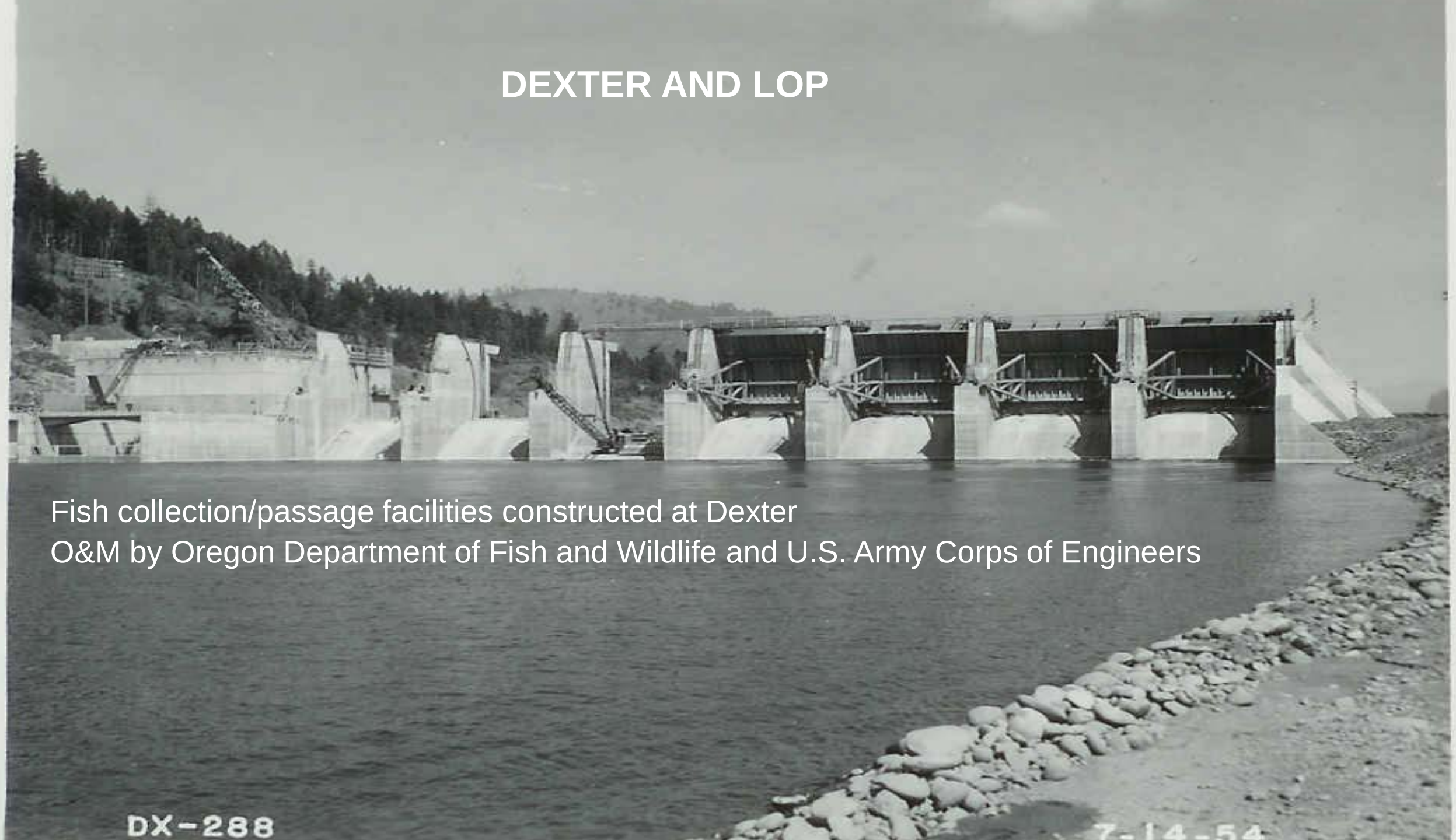
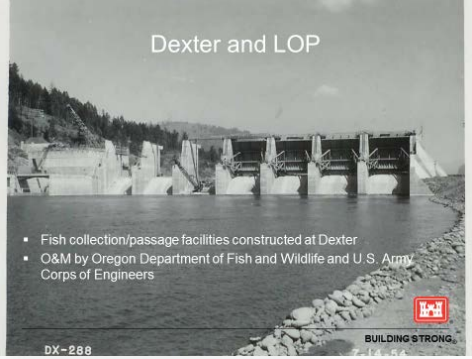
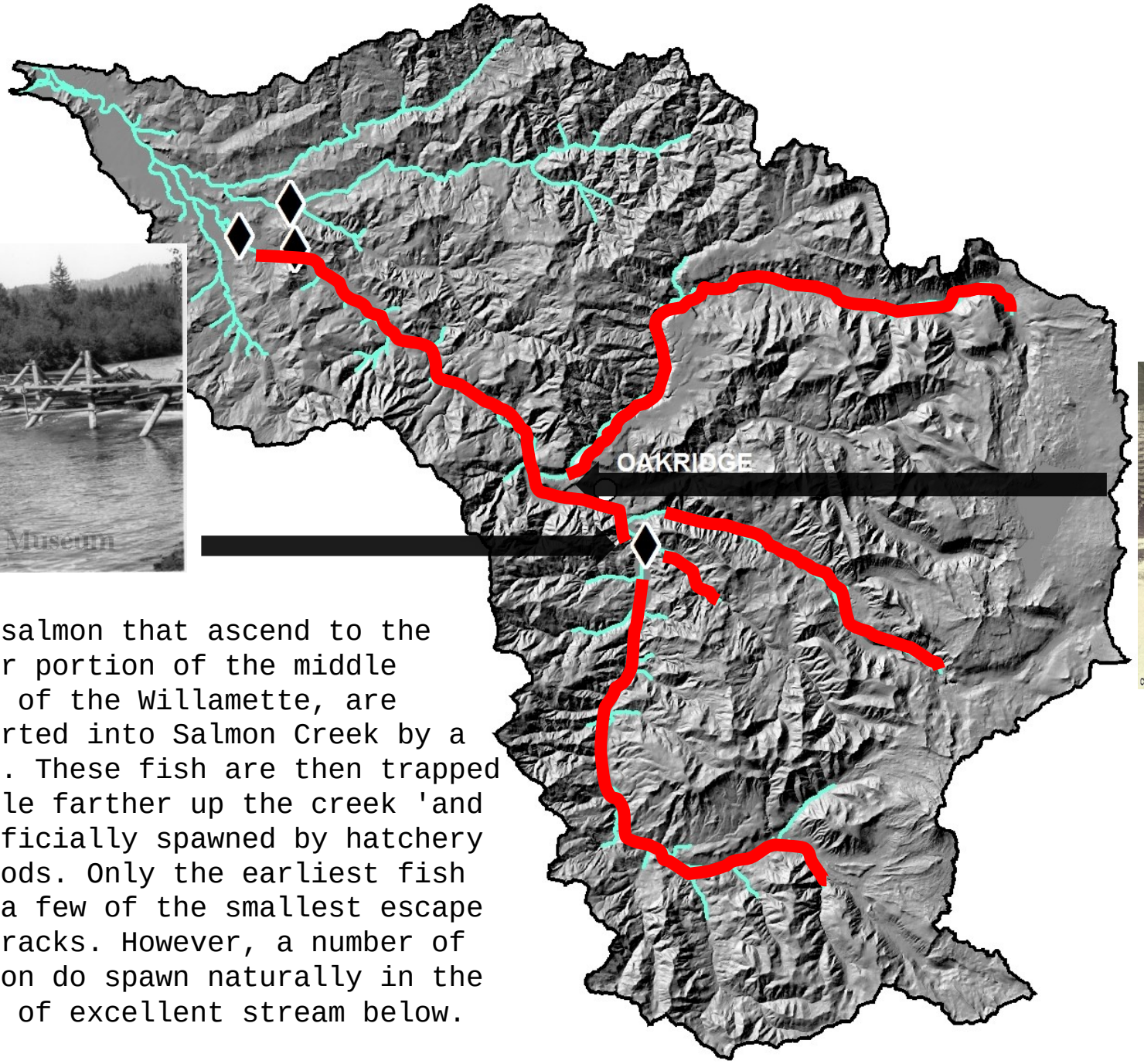
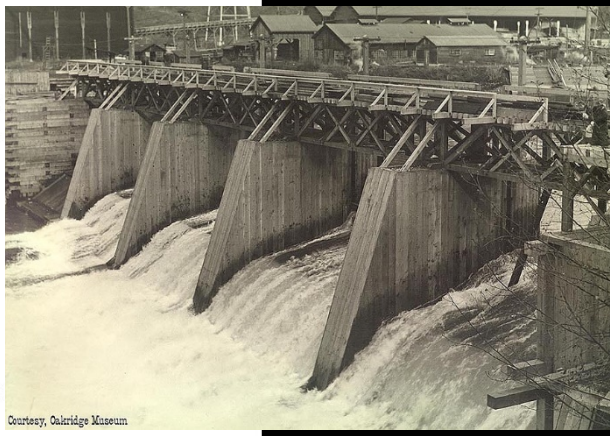
DEXTER AND LOP



Fish collection/passage facilities constructed at Dexter
O&M by Oregon Department of Fish and Wildlife and U.S. Army Corps of Engineers







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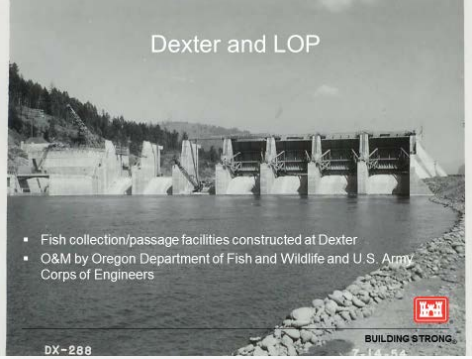

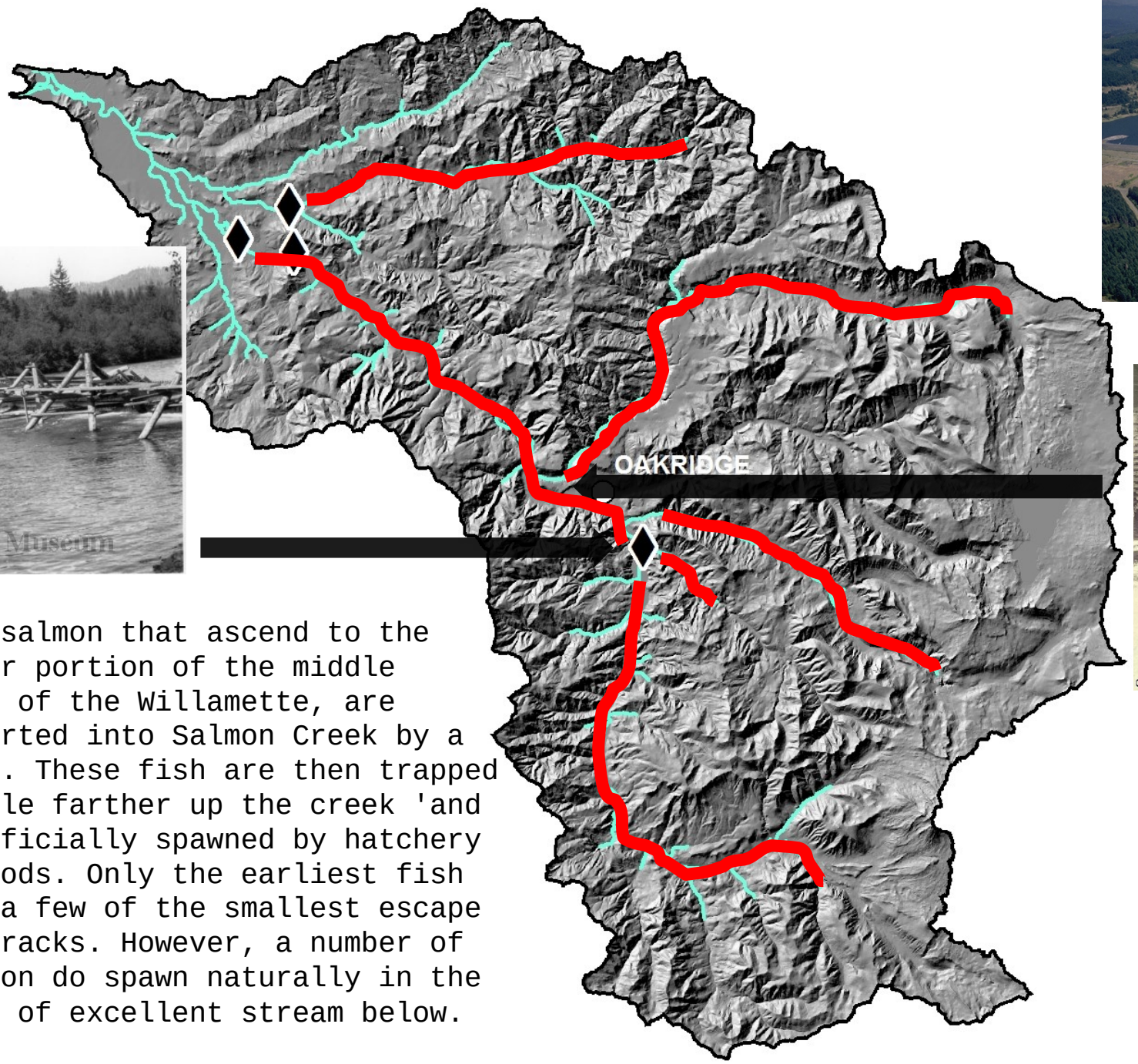

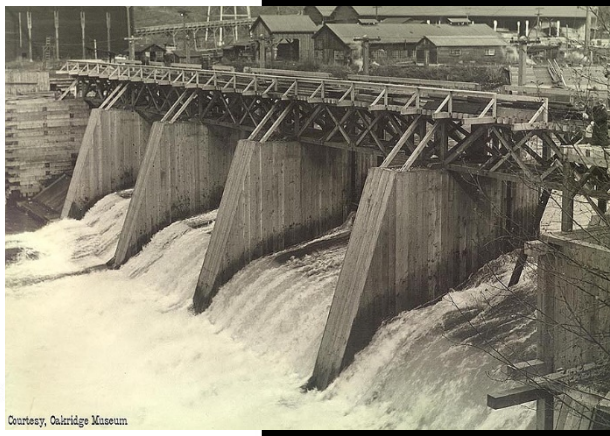

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Access blocked to 124 miles of habitat

Chs spawn in unsuitable habitat (remaining 17 miles)

Egg incubation lethal

No possibility for producing fish below the dam

Sustainable fish population in Middle Fork will require downstream passage

USGS
science for a changing world

Prepared in cooperation with the U.S. Army Corps of Engineers

Water Temperature Effects from Simulated Dam Operations and Structures in the Middle Fork Willamette River, Western Oregon

Open-File Report 2016–1159

U.S. Department of the Interior
U.S. Geological Survey

EVALUATION OF THE ABILITY OF AN ARTIFICIAL OUTLET TO ATTRACT DOWNSTREAM MIGRANT SALMONIDS FROM THE RESERVOIR OF LOOKOUT POINT DAM

Fish Commission of the State of Oregon

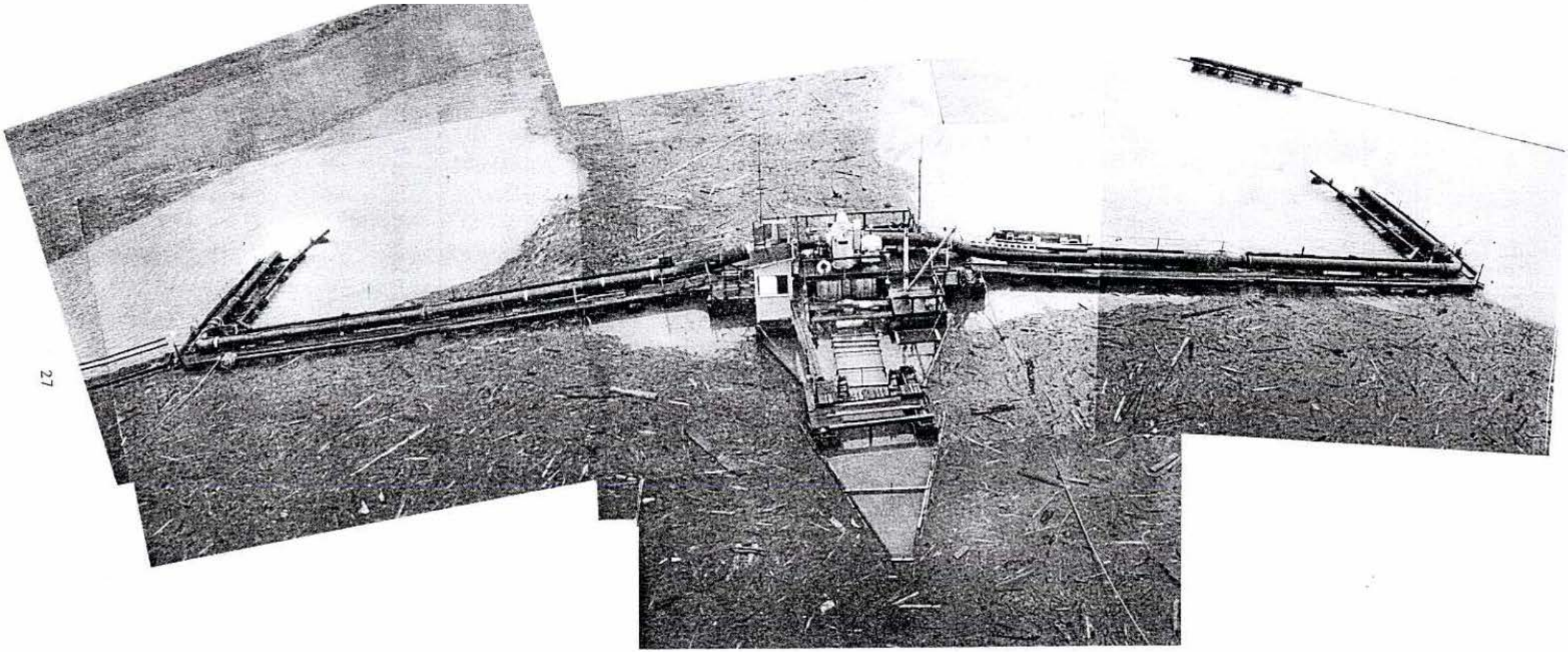

Figure 14. Scoop Trap Used for Sampling Downstream Migrants in Fishing Position below Lookout Point Dam.

EVALUATION OF FISH FACILITIES AND PASSAGE AT FALL CREEK DAM ON BIG FALL CREEK IN OREGON

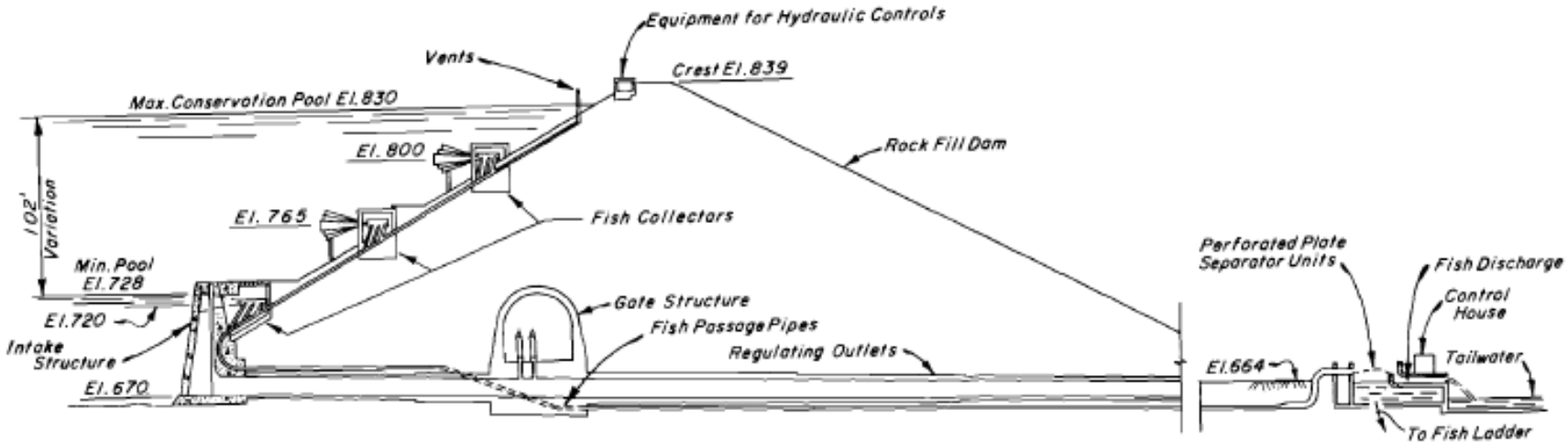

Figure 7. Cross-sectional View of Fall Creek Dam Showing the Downstream-Migrant Transport System Relative to Other Structures

Program History

Restoring Ecological Processes

1993 - ODFW began releasing excess hatchery spring chinook above Cougar and Hills Creek dams

Ocean to freshwater nutrient transfer

Benefits for > 100 vertebrate species (bull trout)

Supplementing natural production was not one of the original goals

Increased Prey Base From Chinook Production

Fry

Fingerling

Smolt

Keefer ML, Taylor GA, Garletts DF, Gauthier GA, Pierce TM, Caudill CC. **Prespawn mortality in adult spring Chinook salmon outplanted above barrier dams. Ecology of Freshwater Fish 2010: 19: 361–372.**

Matthew L. Keefer[1*], Gregory A. Taylor[2], Douglas F. Garletts[2], Chad Helms[2],Greg A. Gauthier[2], Todd M. Pierce[2], Christopher C. Caudill· **RESERVOIR ENTRAPMENT AND DAM PASSAGE MORTALITY OF WILLAMETTE RIVER CHINOOK SALMON.**

Matthew L. Keefer[a*], Gregory A. Taylor[b], Douglas F. Garletts[b], Chad Helms[b], Greg A. Gauthier[b], Todd M. Pierce[b], Christopher C. Caudill· **HIGH-HEAD DAMS AFFECT DOWNSTREAM FISH PASSAGE TIMING AND SURVIVAL IN THE MIDDLE FORK WILLAMETTE RIVER .**


2011
2012
2013

FALL CREEK FISH PASSAGE

- Sub-population now maintained with wild Chinook returns

Adult trap and haul

- Variable pre-spawn mortality
- Will new facility improve pre-spawn mortality?

Juvenile dam passage:

- Via reservoir drawdown

Challenges

Pre-spawn mortality can be high in transported spring Chinook salmon

Ability to safely and efficiency pass juvenile salmon downstream

• Middle Fork Research Plan, 2017

Key questions

Can survival across life stages be sufficiently improved to support a sustainable spring Chinook Salmon population above Lookout Point Dam?

Which downstream fish passage strategy is likely best for population viability?

- at-dam structural passage
- head-of-reservoir or in-tributary collection and bypass
- alternative project operations (spill, drawdown)
- combination