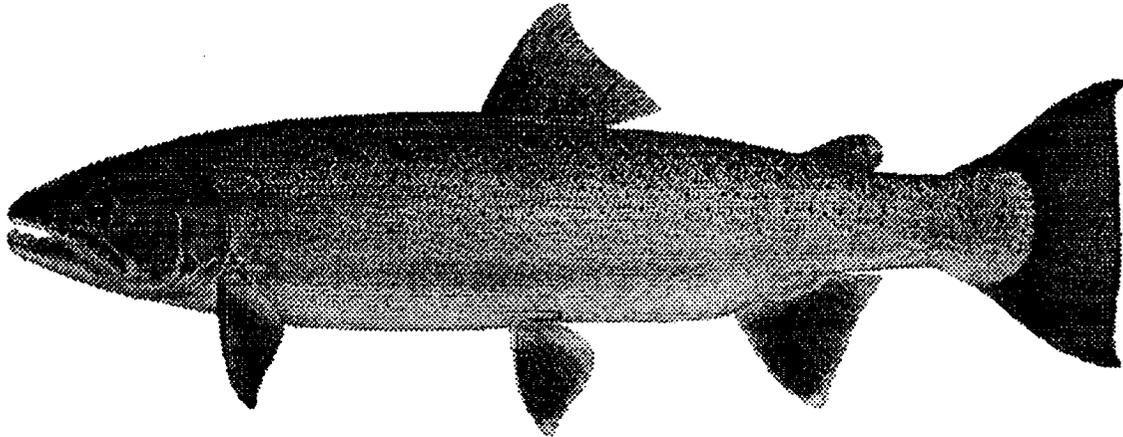


# National Marine Fisheries Service



Steelhead (*Oncorhynchus mykiss*)

## West Coast Steelhead Briefing Package



*July, 1996*

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Cover Illustration by J. Tomelleri in Behnke (1992)

## ISSUES

The purpose of this document is to provide a briefing on the proposed rule to list certain populations of steelhead and to highlight a few issues that still need to be resolved. This effort is the most comprehensive review of west coast steelhead ever undertaken, encompassing all populations in Washington, Oregon, Idaho, and California.

The National Marine Fisheries Service (NMFS) has a responsibility to review the status of species of sea-run (anadromous) fish which may warrant listing as threatened or endangered pursuant to the Endangered Species Act of 1973 (ESA). NMFS has completed a coastwide status review of steelhead stocks residing in the states of Washington, Oregon, Idaho, and California and has identified evolutionarily significant units (ESUs)<sup>1</sup> of steelhead on the Pacific coast which potentially warrant listing under the ESA. Due to a congressionally-mandated moratorium on listing activities, NMFS has fallen behind on its listing actions. The court has ordered NMFS to complete its one-year determination on steelhead by July 31, 1996.

**Klamath Mountains Province Steelhead:** KMP steelhead were proposed as a threatened species in March 1995. It makes sense to look at the ESUs comprehensively, and thus NMFS is including KMP steelhead in the proposed rule for west coast steelhead.

**Hatchery Populations:** NMFS will now work state, Federal, and tribal authorities to determine which hatchery populations should be included in each of the steelhead ESUs. Hatchery populations which are similar to the natural populations will be included in the ESUs. NMFS intends to announce the hatchery populations that should be included in each ESU at the time of final listing, should a final listing occur. Any hatchery population that is included in a listed ESU and determined essential for recovery will also be listed and thus protected under the ESA. NMFS' first priority has been to establish the status of natural steelhead populations from southern California to the Canadian border.

**Rainbow Trout:** Available information indicates that resident forms of *O. mykiss* (i.e., rainbow trout) may share a common gene pool with steelhead residing in the same geographic area, at least over evolutionary time periods. Further, it was the consensus of fishery biologists consulted throughout the region that resident fish should generally be

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<sup>1</sup> The ESA defines a "species" to include any "distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." NMFS policy provides that a salmonid population will be considered distinct, and hence a species under the ESA, if it represents an ESU of the biological species. This policy was adopted on November 20, 1991 (56 FR 58612). A population must satisfy two criteria to be considered an ESU: (1) it must be reproductively isolated from other conspecific populations units, and (2) it must represent an important component of the evolutionary legacy of the species.

considered part of the steelhead ESUs. However, even though NMFS requested data regarding rainbow trout abundance during its west coast steelhead status review, very little was received. NMFS is requesting additional information regarding whether the inclusion of resident O. mykiss in the steelhead ESUs is warranted. NMFS will consider all new information and public comment received on this proposal and will work with the U.S. Fish and Wildlife Service to resolve this issue prior to making final determinations.

## BACKGROUND

### *Petition Background*

On May 5, 1992, NMFS received a petition from the Oregon Natural Resources Council, the Siskiyou Regional Education Project, Federation of Fly Fishers, Kalmiopsis Audubon Society, Siskiyou Audubon Society, Klamath/Siskiyou Coalition, Headwaters, The Wilderness Society, North Coast Environmental Center, The Sierra Club - Oregon Chapter, and the National Wildlife Federation, to list indigenous, naturally-spawning Illinois River winter steelhead (*Oncorhynchus mykiss*) and to designate critical habitat under the ESA. On July 31, 1992, NMFS published a notice indicating that a listing may be warranted (57 FR 33939) and concurrently solicited information about the status of this population. NMFS completed a status review which concluded that Illinois River winter steelhead did not represent a "species" under the ESA (58 FR 29390). However, NMFS recognized that this population was part of a larger ESU that may be threatened or endangered because of declining trends in steelhead abundance in several southern Oregon streams.

In its May 20, 1993, finding regarding Illinois River (a tributary to the Rogue River in Southwestern Oregon) steelhead, NMFS announced that it would conduct an expanded status review to identify all steelhead ESU(s) within California, Oregon, and Washington, and would determine whether any identified ESU(s) were threatened or endangered.

Subsequently, on February 16, 1994, NMFS received a petition from the Oregon Natural Resources Council and 15 co-petitioners to identify all steelhead ESU(s) within the states of California, Oregon, Washington and Idaho, and to determine whether any identified ESU(s) warrant listing under the ESA. In response to this petition, NMFS announced that its status review of steelhead would be further expanded to include steelhead populations occurring in eastern Washington and Oregon and the state of Idaho (59 FR 27527, May 27, 1994).

On September 21, 1993, NMFS received a petition from Washington Trout to list Deer Creek (a tributary to the North Fork Stillaguamish River in Northeastern Washington) summer steelhead. On December 23, 1993, NMFS published its determination that listing of this population may be warranted (58 FR 68108). NMFS completed a status review which concluded that Deer Creek summer steelhead did not represent a "species" under the ESA (see November 21, 1994, 59 FR 59981). However, NMFS further concluded that Deer Creek summer steelhead were part of a larger ESU and for which a status review was currently underway.

On March 16, 1995, NMFS published a proposed rule to list Klamath Mountains Province (KMP) steelhead as threatened (60 FR 14253). This proposal includes steelhead populations occurring in coastal streams between Cape Blanco, Oregon, and the Klamath River Basin in Oregon and California, inclusive. The KMP steelhead proposal is based on NMFS' commitment to define the range and status of the steelhead ESU which inhabits the Illinois River.

### *Congressional Moratorium and Legal Actions*

On September 6, 1995, the Sierra Club Legal Defense Fund (SCLDF) filed suit to accelerate findings under the ESA for west coast steelhead. On December 18, 1995, SCLDF filed a motion for summary judgment.

On January 26, 1996, Congress enacted a Continuing Resolution (Public Law 104-99) which provides funding for the Department of Commerce and NMFS. Pursuant to Title II of Public Law 104-99, funding for NMFS was provided until March 15, 1996, or until an appropriations bill could be passed and enacted into law, whichever came first. On March 15, 1996, Congress amended Public Law 104-99 to provide funding for NMFS until March 22, 1996. These Continuing Resolutions appropriate funds at a rate provided for in the Fiscal Year 1996 Appropriations Conference Report and joint explanatory statement (House Report 104-378). In this Conference Report Congress stated its intent to eliminate all funding for NMFS' listing of species under section 4 of the ESA. Therefore, NMFS was not funded to prepare or publish a proposed determination under the ESA on the status of west coast steelhead until April 26, 1996, when the President waived the moratorium on ESA listing activities, as authorized by the FY 1996 Omnibus Appropriations Act.

On May 23, 1996, the NWR filed a declaration to the district court for the northern district of California, stating that NMFS would complete the one-year determination for west coast steelhead by December 3, 1996. On June 26, 1996, Judge Illston ordered NMFS to make a one-year determination on west coast steelhead by July 31, 1996.

Prior to the rescission of its ESA funding for listing activities, NMFS drafted several major documents related to its status review of west coast steelhead. NMFS' Northwest Fisheries Science Center and Southwest Regional Office, as well as a representative of the National Biological Service, completed a report detailing the status of steelhead in Washington, Idaho, Oregon, and California. NMFS also completed two reports which address (1) factors which have led to the decline of west coast steelhead, and (2) available conservation measures for west coast steelhead. A proposed rule has been published in the *Federal Register* based on the status review.

### *Steelhead Life History*

Historically, steelhead have been differentiated from other species of Pacific salmon; such a distinction is commonly made even today. When they were first described, all native species of North American trout (including steelhead) were placed in the genus Salmo. However, biologists have recently concluded that steelhead have a greater affinity with Pacific salmon (genus Oncorhynchus) than with trout. Therefore, the term "Pacific salmon" includes the steelhead species.

Steelhead exhibit one of the most complex suites of life history traits of any salmon species. Steelhead may exhibit anadromy (meaning they migrate from fresh water to the ocean, and then return to spawn in fresh water) or non-anadromy (meaning they reside their entire life in fresh water). Resident forms are usually referred to as "rainbow" or "redband" trout, while

anadromous life forms are termed "steelhead." Few detailed studies have been conducted regarding the relationship between resident and anadromous O. mykiss and as a result, the relationship between these two life history forms is poorly understood.

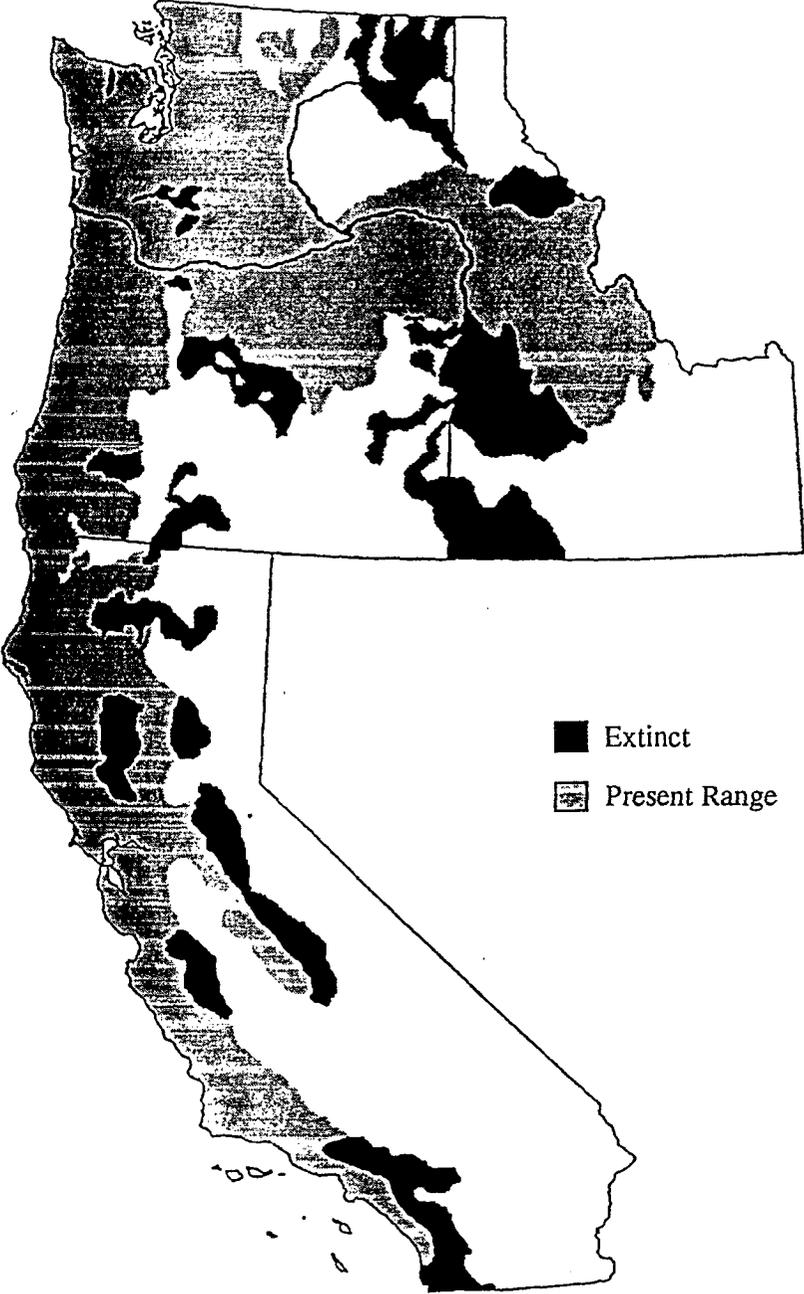
Two major genetic groups or "subspecies" of steelhead occur on the west coast of the United States: a coastal group and an inland group, separated approximately in the Fraser and Columbia River Basins by the Cascade crest. Behnke (1992) proposed to classify the coastal subspecies as O. m. irideus and the inland subspecies as O. m. gairdneri. The anadromous and nonanadromous forms of O. mykiss are grouped together for each "subspecies." Both coastal and inland steelhead occur in Washington and Oregon. California is thought to have only coastal steelhead while Idaho has only inland steelhead.

Steelhead typically migrate to marine waters after spending two years in fresh water. In the marine environment they typically rear for 1 to 3 years prior to returning to their natal stream to spawn primarily as three- and four-year-olds. Unlike other Pacific salmon, steelhead are iteroparous, meaning that they are capable of spawning more than once before they die. However, most steelhead survive to spawn only once; the majority of multiple spawners are females. Steelhead spawning season typically stretches from December through June. Steelhead eggs may incubate in "redds" (nesting gravels) for 1.5 to 4 (depending on water temperature) months before hatching as "alevins" (a larval life stage dependent on food stored in a yolk sac). Following yolk sac absorption, alevins emerge from the gravel as young juveniles or "fry" and begin actively feeding. Juveniles rear in fresh water from 1 to 4 years (usually 2 years), then migrate to the ocean as "smolts."

Biologically, steelhead can be divided into two reproductive ecotypes, based on their state of sexual maturity at the time of river entry and the duration of their spawning migration. These two ecotypes are termed "stream maturing" and "ocean maturing." Stream maturing steelhead enter fresh water in a sexually immature condition and require several months to mature and spawn. Ocean maturing steelhead enter fresh water with well-developed gonads and spawn shortly after river entry. These two reproductive ecotypes are more commonly referred to by their season of freshwater entry (e.g., summer and winter steelhead, respectively).

Historically, steelhead were distributed throughout the North Pacific Ocean from Russia to the northern Baja Peninsula. Presently, the species' distribution extends from the Kamchatka Peninsula in Asia, east and south along the Pacific coast of North America to the Santa Margarita River in southern California (Figure 1). Historically, steelhead likely inhabited most coastal streams in Washington, Oregon, and California as well as many

Figure 1. Approximate Present versus Historic Range of Steelhead in Washington, Oregon, Idaho, and California (sources: The Wilderness Society and NMFS).



inland streams in these states and Idaho. However, during this century, more than 23 indigenous, naturally-reproducing steelhead stocks are believed to have been extirpated and many more are in decline in numerous coastal and inland streams in Washington, Oregon, Idaho, and California. Recently published surveys of steelhead status have identified at least 43 steelhead stocks at moderate or high risk of extinction on the West Coast of the United States (Nehlsen et al. 1991).

## STATUS OF WEST COAST STEELHEAD

### *Status Review Process and Findings*

To ensure that the west coast steelhead status review was based on the best available scientific and commercial information, NMFS convened Pacific Salmon Biological Technical Committees in Washington, Oregon, Idaho, and California. The committees included steelhead experts from Federal, state, local, and tribal agencies, academia, and other interested parties from the West Coast.

Through this status review process, and after considering all available information, NMFS identified 15 ESUs of steelhead inhabiting a range from northern Washington to southern California (Figure 2). NMFS has concluded that ten steelhead ESUs warrant listing, four ESUs do not presently warrant listing, and one ESU warrants candidate status (i.e., an ESU requiring further consideration due to inconclusive data).

<u>Evolutionarily Significant Unit</u>	<u>Proposed status</u>
1. Puget Sound ESU	Not warranted
2. Olympic Peninsula ESU	Not warranted
3. Southwest Washington ESU	Not warranted
4. Lower Columbia River ESU	Threatened
5. Upper Willamette River ESU	Not warranted
6. Oregon Coast ESU	Threatened
7. Klamath Mountains Province ESU	Threatened
8. Northern California ESU	Threatened
9. Central California Coast ESU	Endangered
10. South/Central California Coast ESU	Endangered
11. Southern California ESU	Endangered
12. Central Valley ESU	Endangered
13. Middle Columbia River ESU	Candidate <sup>2</sup>
14. Upper Columbia River ESU	Endangered
15. Snake River Basin ESU	Threatened

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<sup>2</sup> NMFS regulations define a candidate species as any species under consideration for listing, but not yet the subject of a proposed rule. In the case of the Middle Columbia River ESU, insufficient scientific information presently exists on which to base a listing determination. NMFS has therefore committed to review the status of this ESU and make a listing determination within one year.

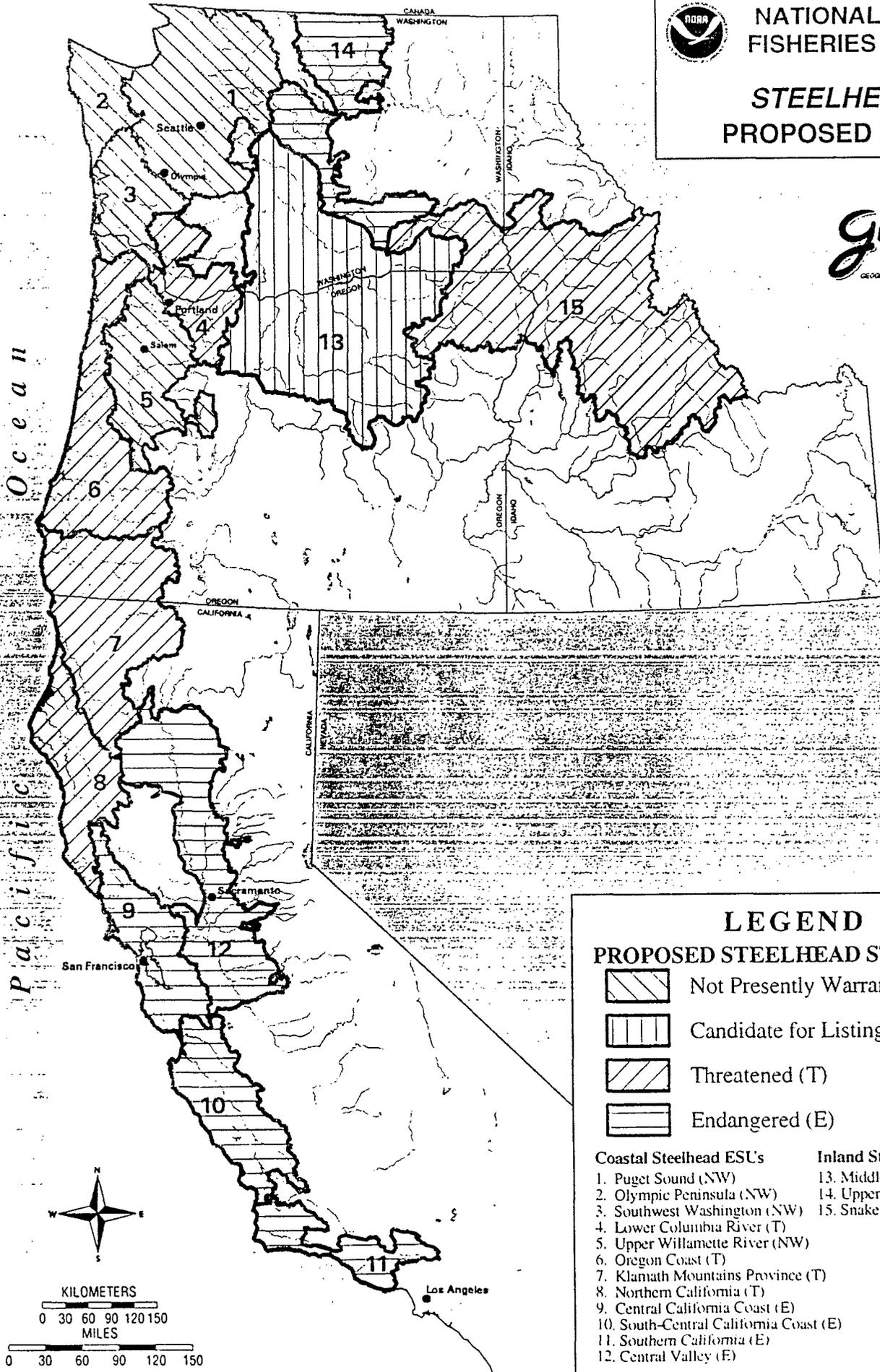
Historical and recent run-size estimates derived from dam and weir counts, stream surveys, and angler catch estimates were used to determine status of the ESUs. The proportion of hatchery fish on the spawning grounds also affected the status determinations because hatchery production outnumbers wild fish production in many areas. This can lead to genetic introgression because, often, the hatchery production originates from a nonnative stock.

In its comprehensive scientific review, NMFS found that most steelhead populations are depressed throughout their range on the West Coast. Consequently, even though several steelhead ESUs are not now proposed for listing, this does not mean that these ESUs are "healthy." NMFS will continue to monitor the status of those ESUs which are not subject to this proposed rule, and will make listing determinations as the need arises.



NATIONAL MARINE FISHERIES SERVICE

# STEELHEAD PROPOSED ESUs



## LEGEND

### PROPOSED STEELHEAD STATUS

-  Not Presently Warranted (NW)
-  Candidate for Listing (C)
-  Threatened (T)
-  Endangered (E)

#### Coastal Steelhead ESUs

- 1. Puget Sound (NW)
- 2. Olympic Peninsula (NW)
- 3. Southwest Washington (NW)
- 4. Lower Columbia River (T)
- 5. Upper Willamette River (NW)
- 6. Oregon Coast (T)
- 7. Klamath Mountains Province (T)
- 8. Northern California (T)
- 9. Central California Coast (E)
- 10. South-Central California Coast (E)
- 11. Southern California (E)
- 12. Central Valley (E)

#### Inland Steelhead ESUs

- 13. Middle Columbia River (C)
- 14. Upper Columbia River (E)
- 15. Snake River Basin (T)

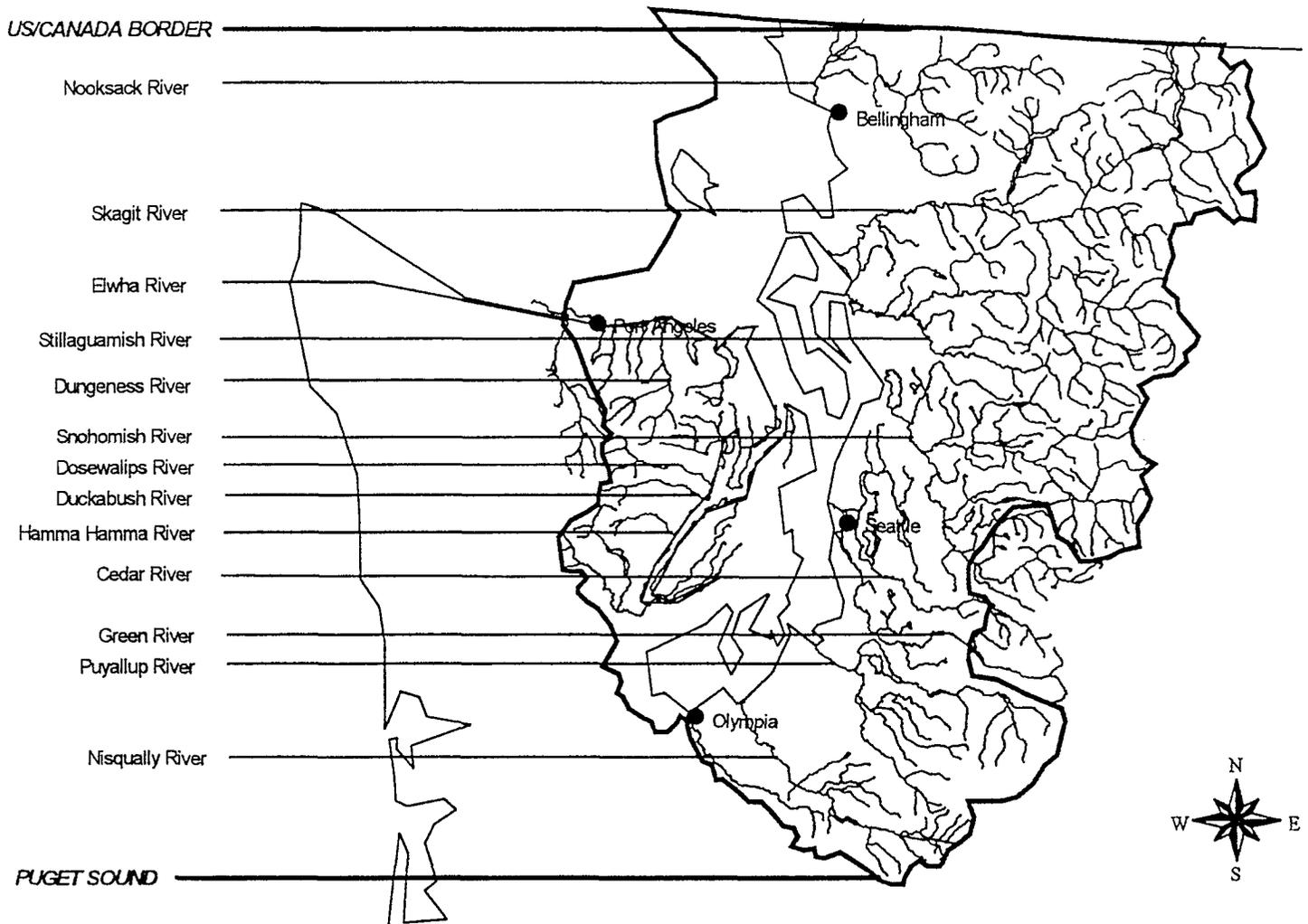


KILOMETERS  
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MILES

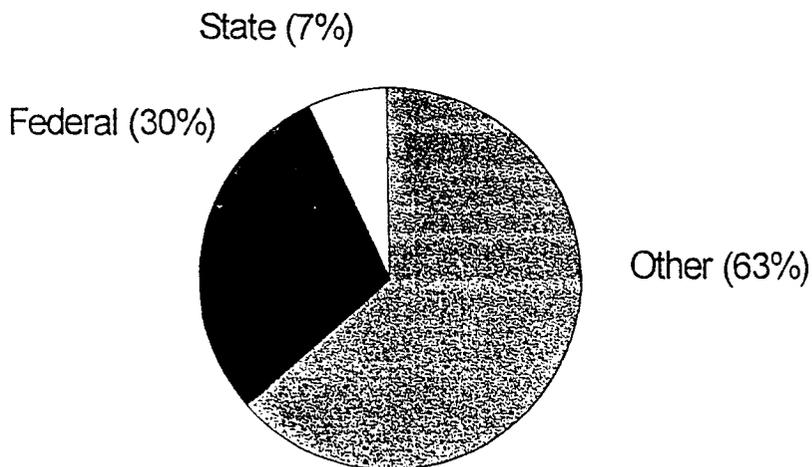
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July 17, 1996

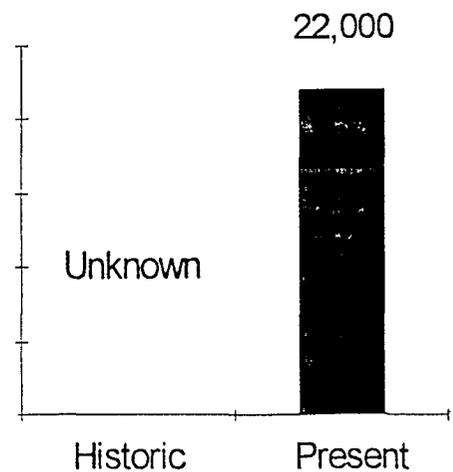
# ESU 1: Puget Sound



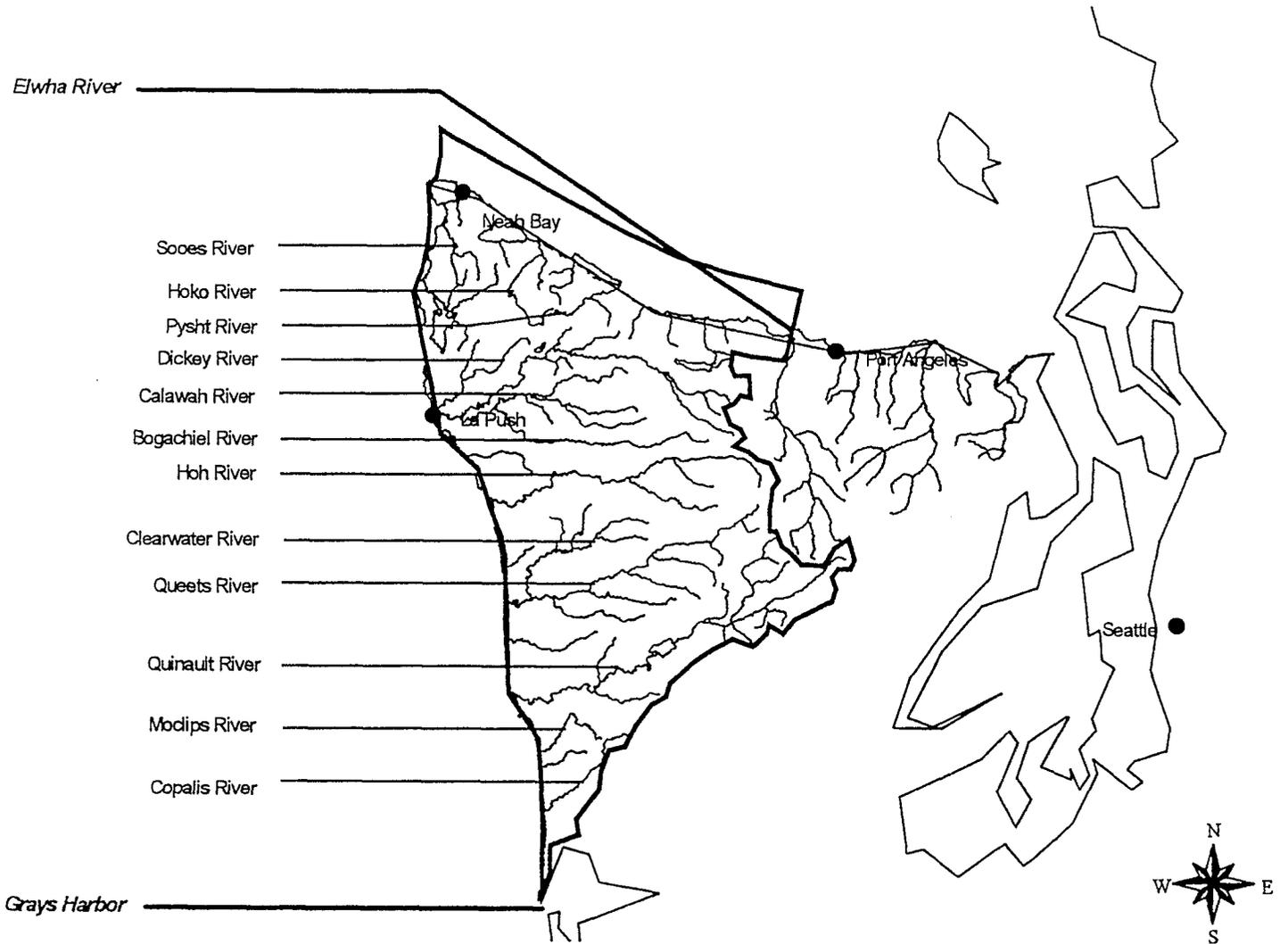
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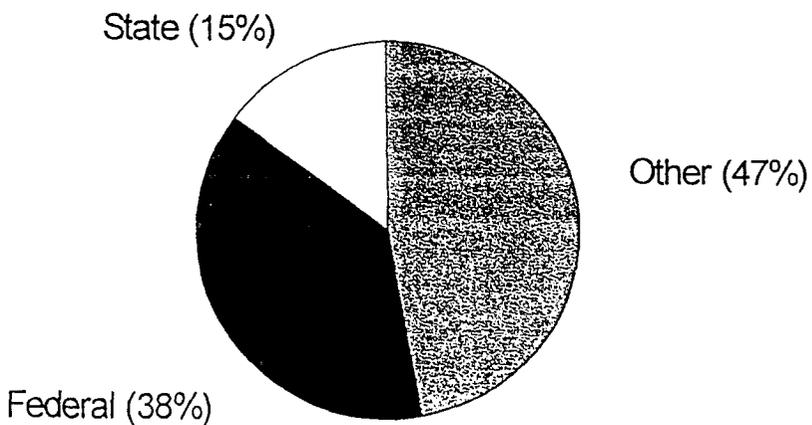
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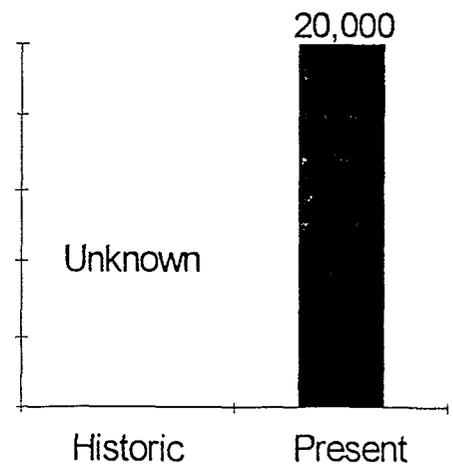
# ESU 2: Olympic Peninsula



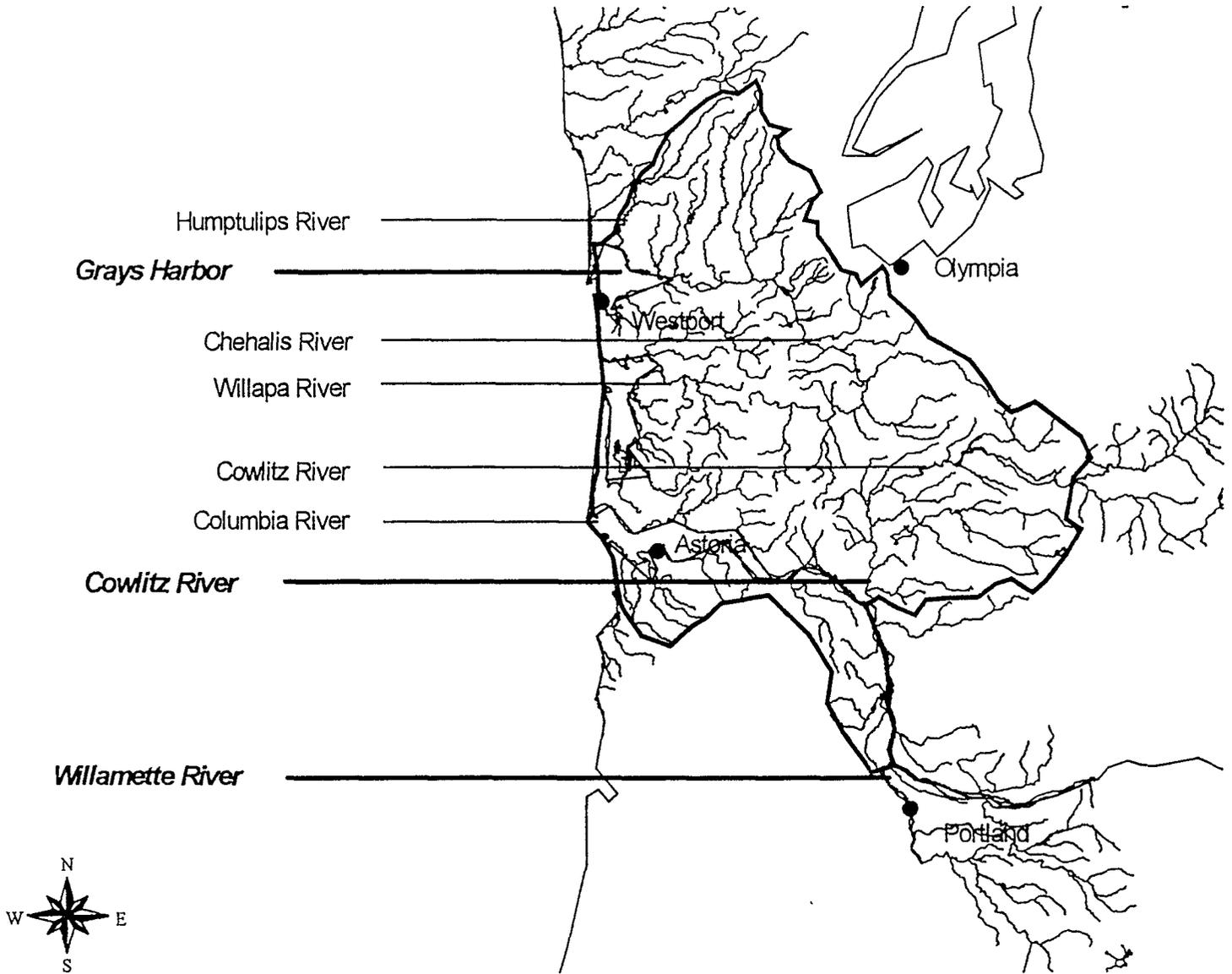
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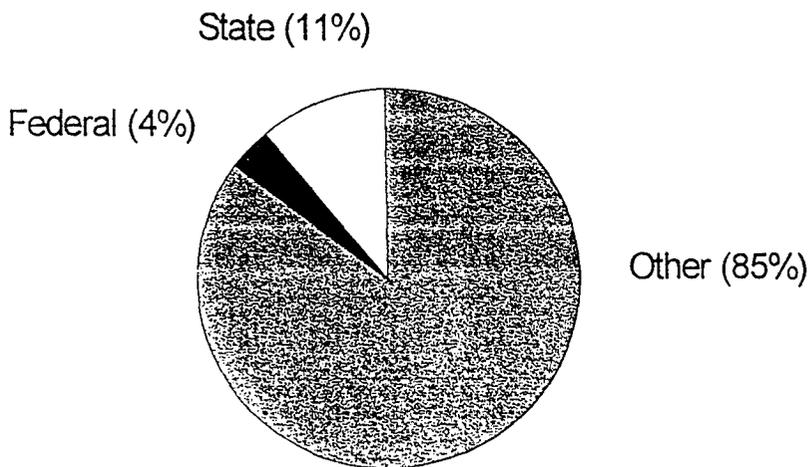
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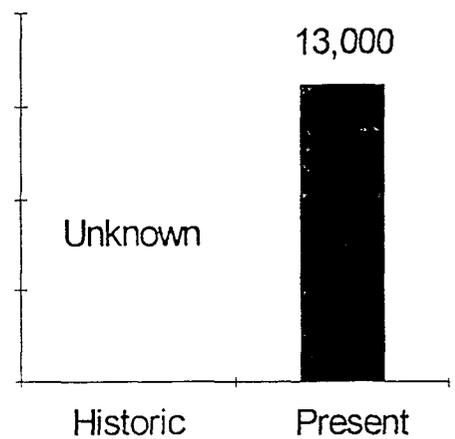
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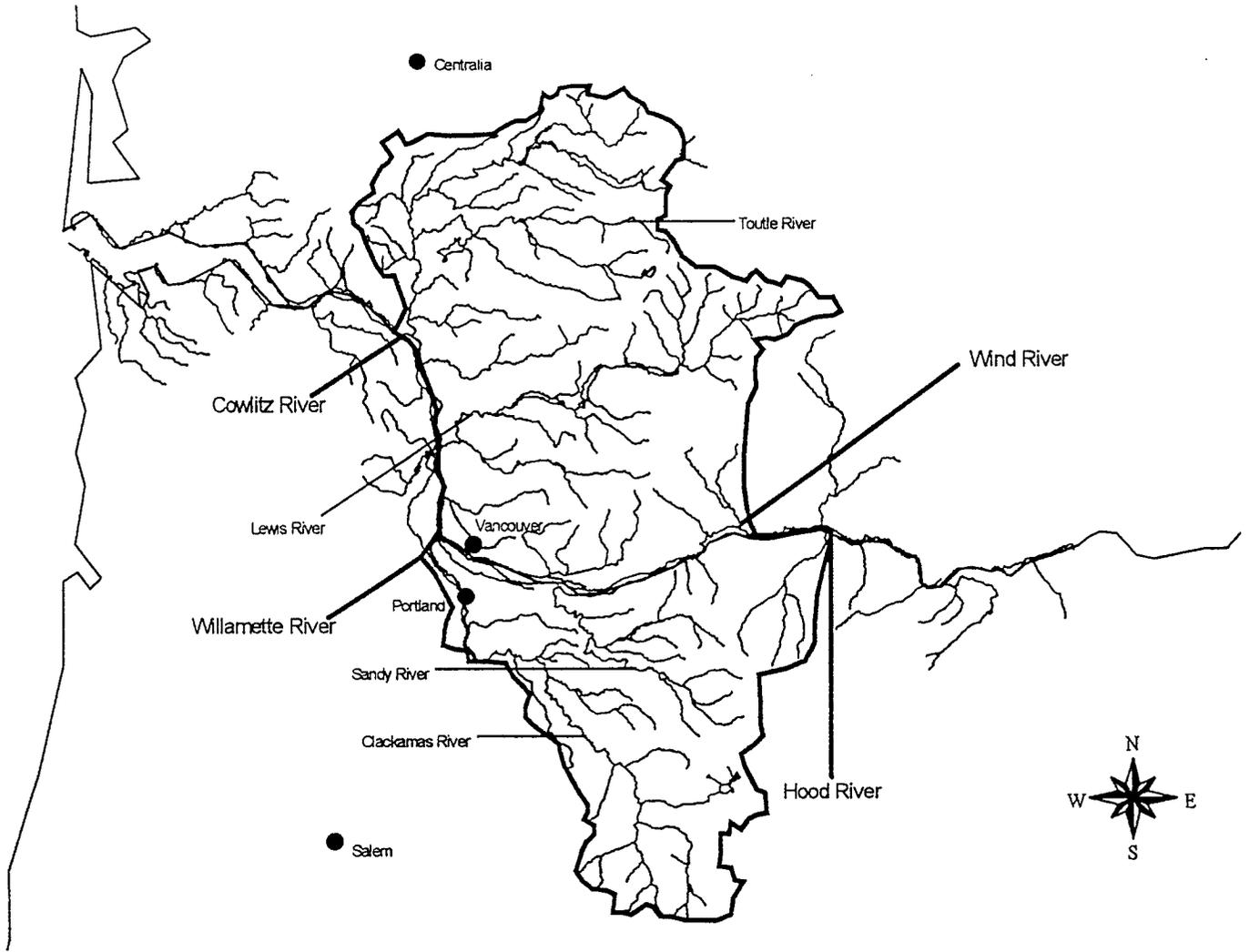
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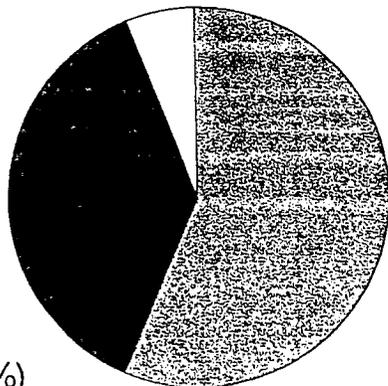


# ESU 4: Lower Columbia River



## Land Ownership

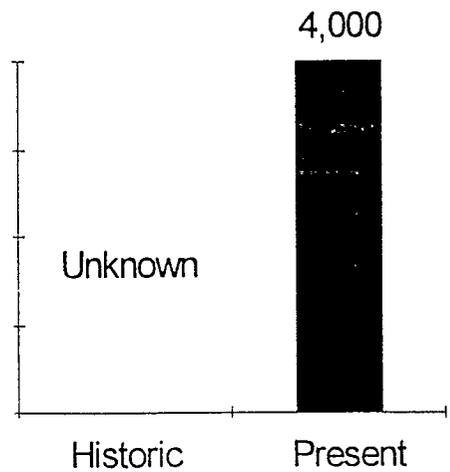
State (6%)



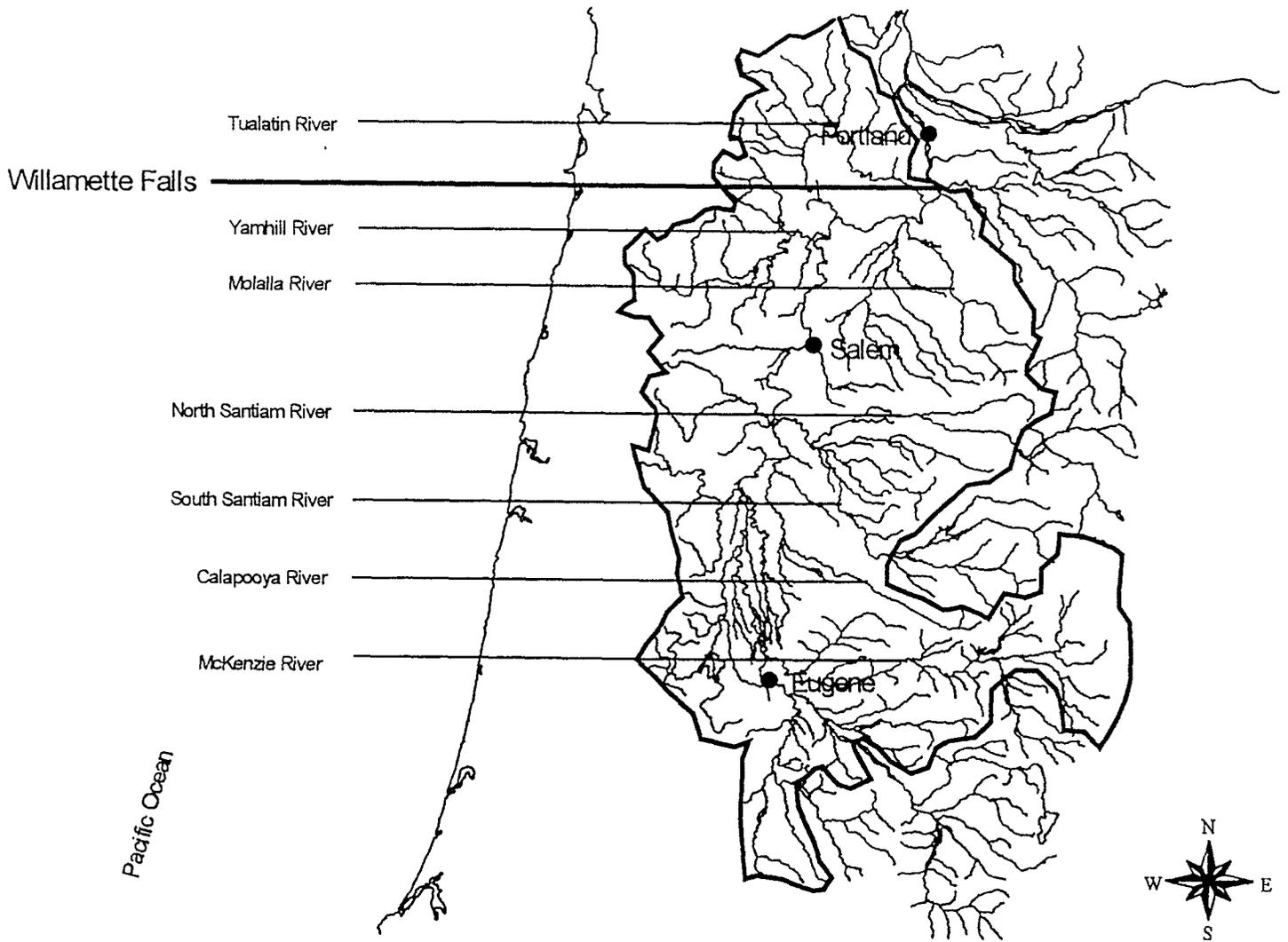
Federal (38%)

Other (56%)

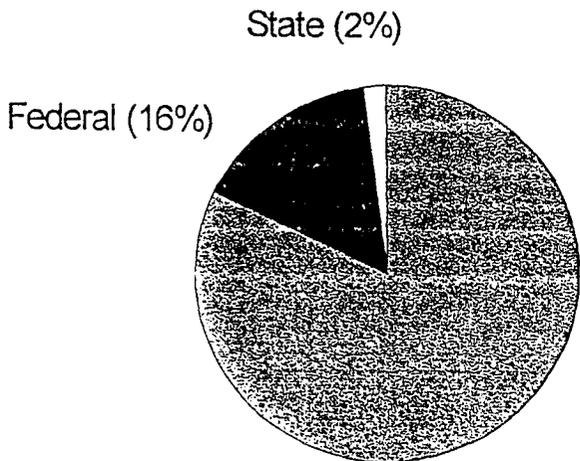
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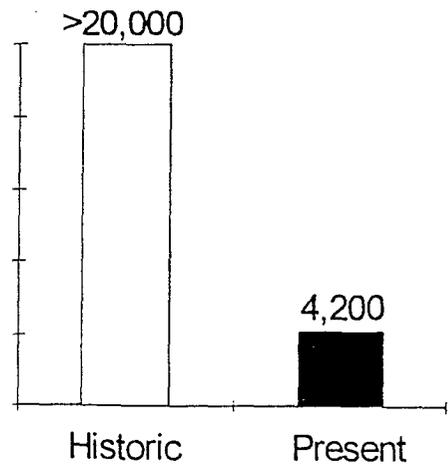
# ESU 5: Upper Willamette River



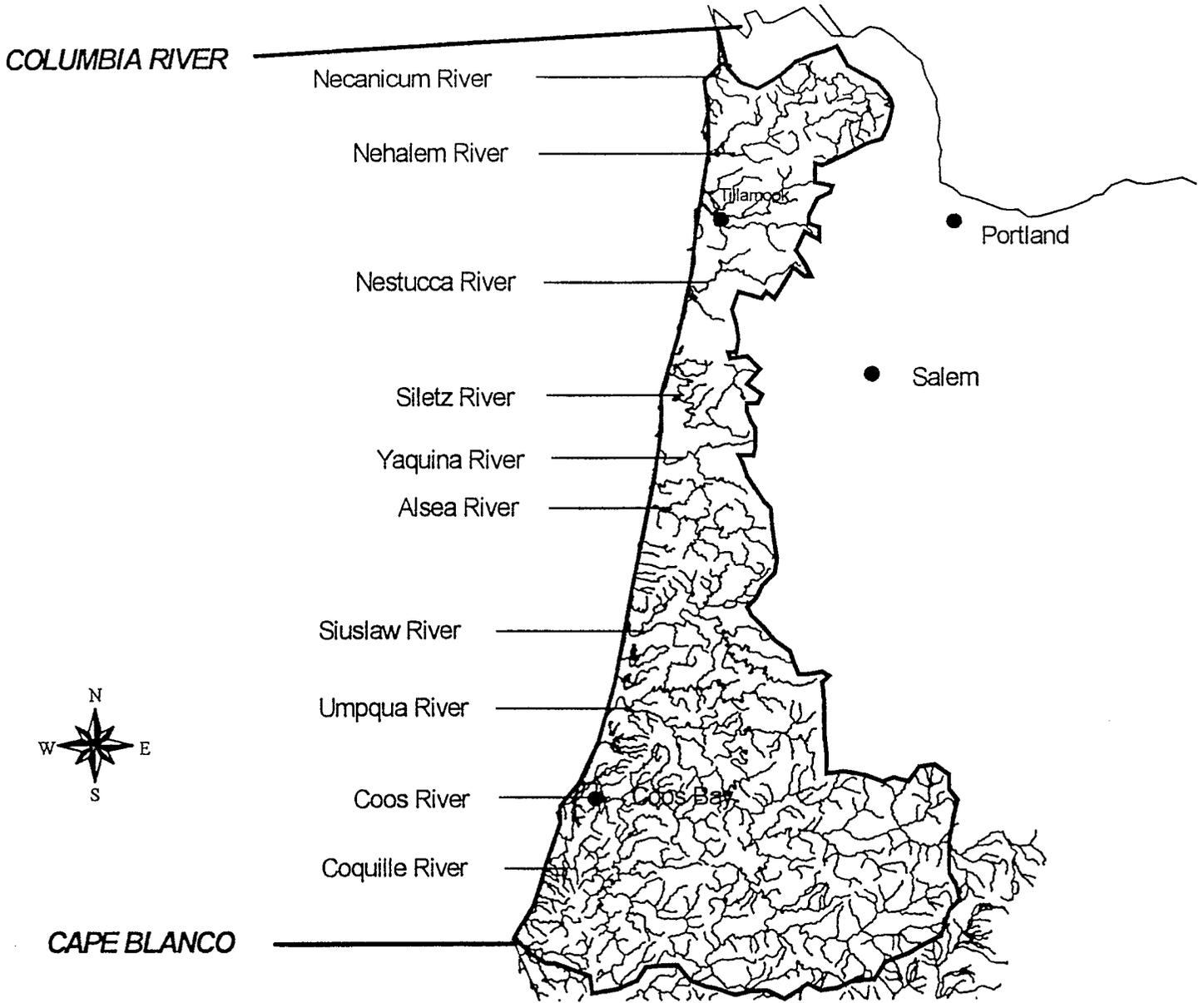
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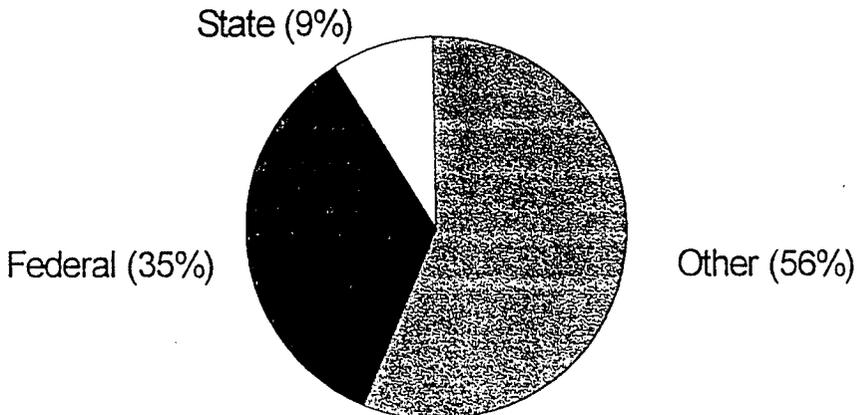
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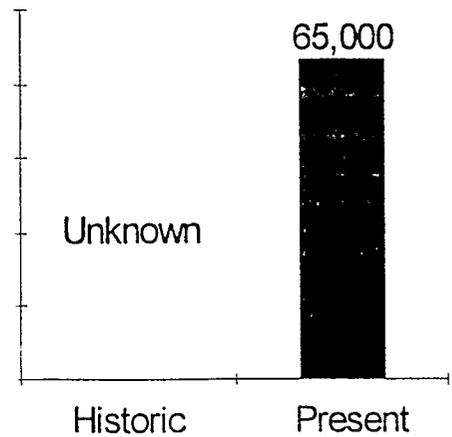
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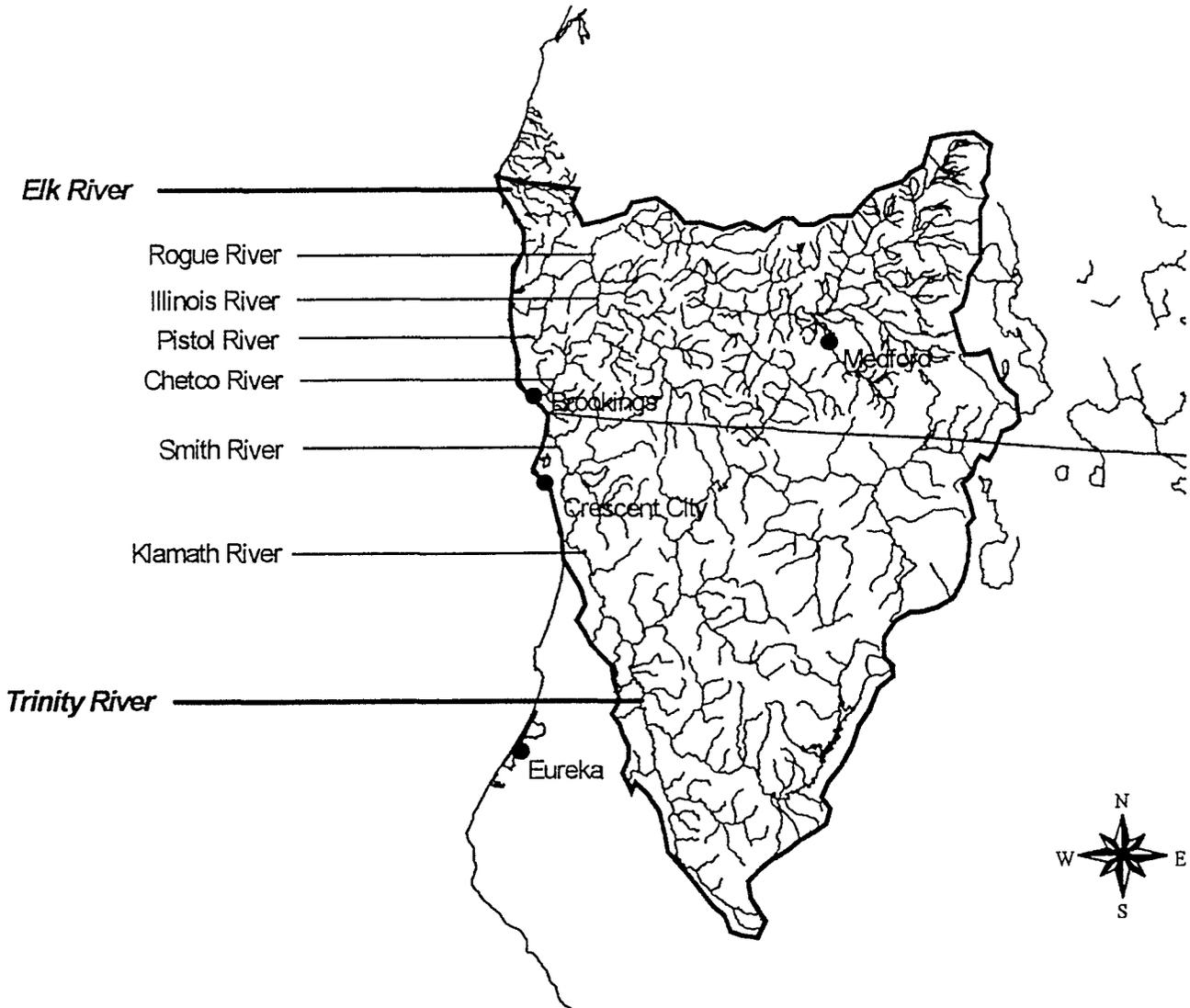
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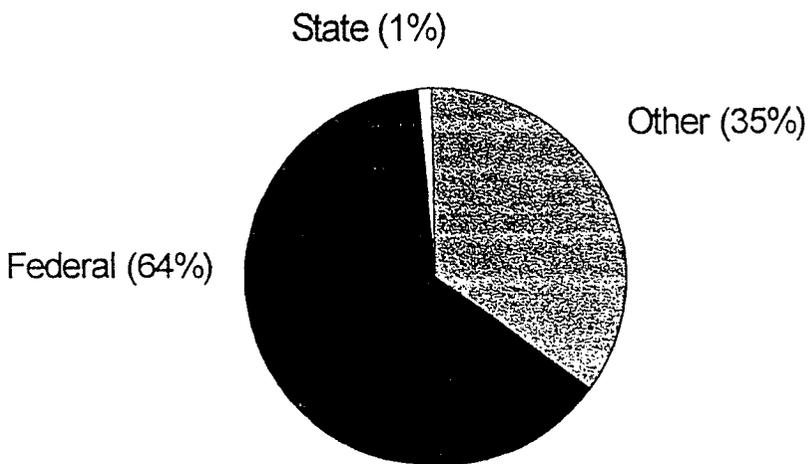
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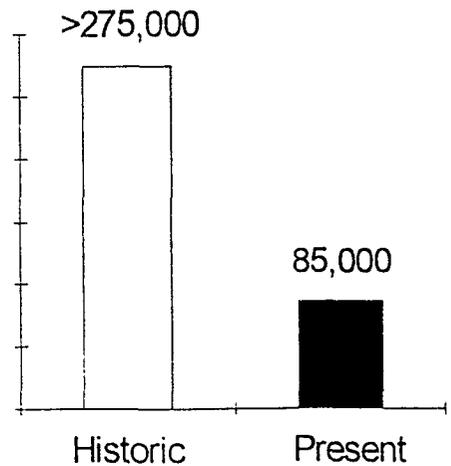
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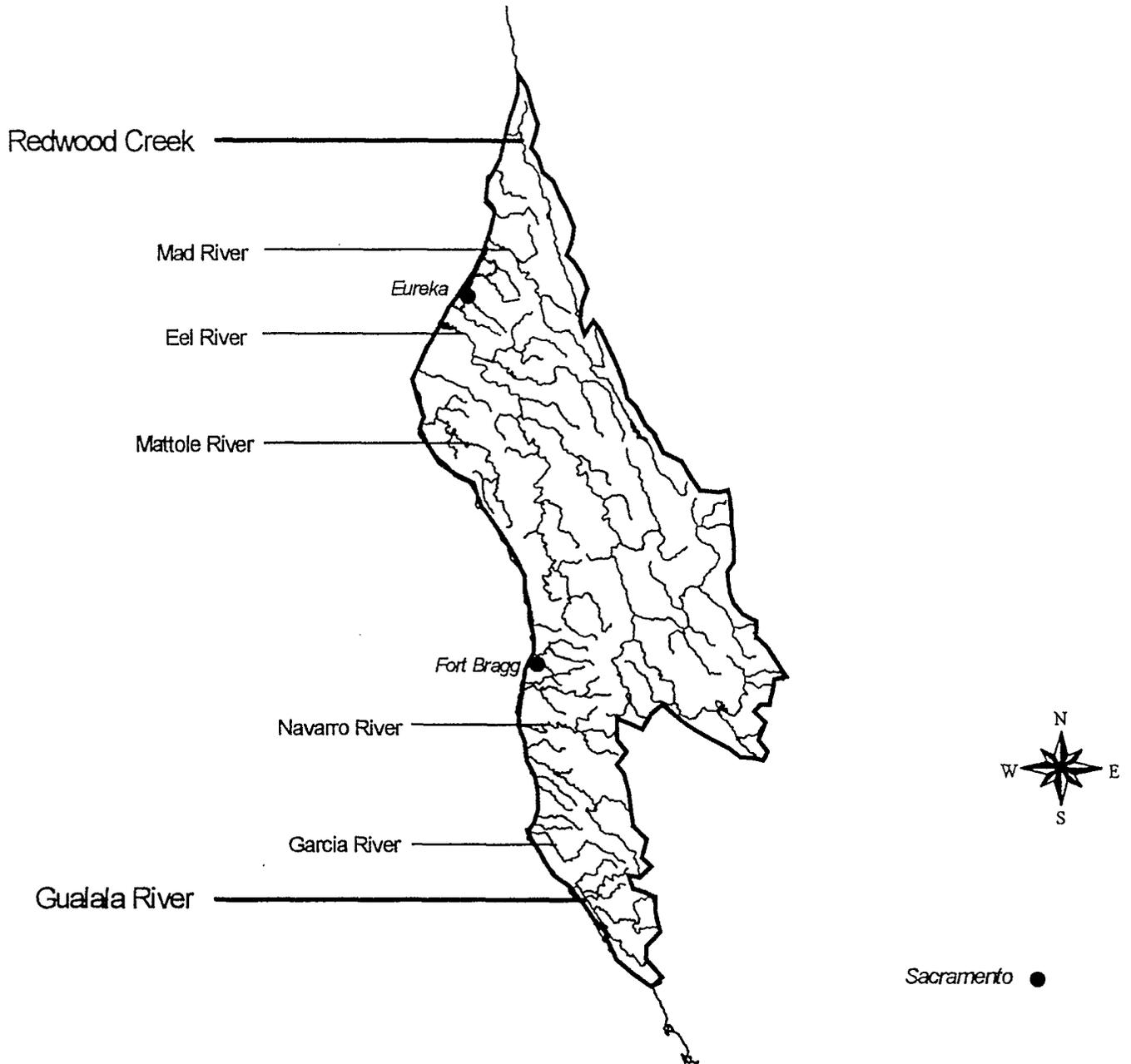
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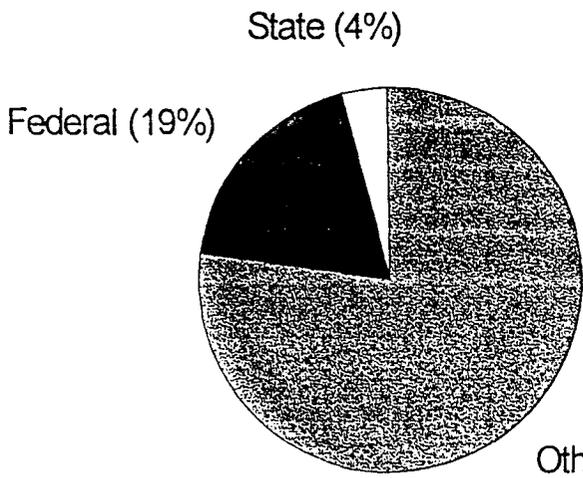
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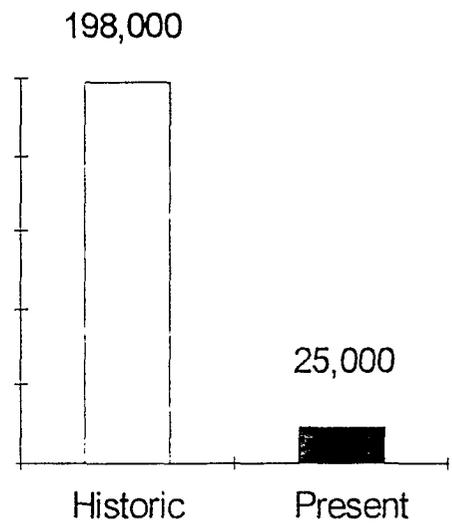
# ESU 8: Northern California



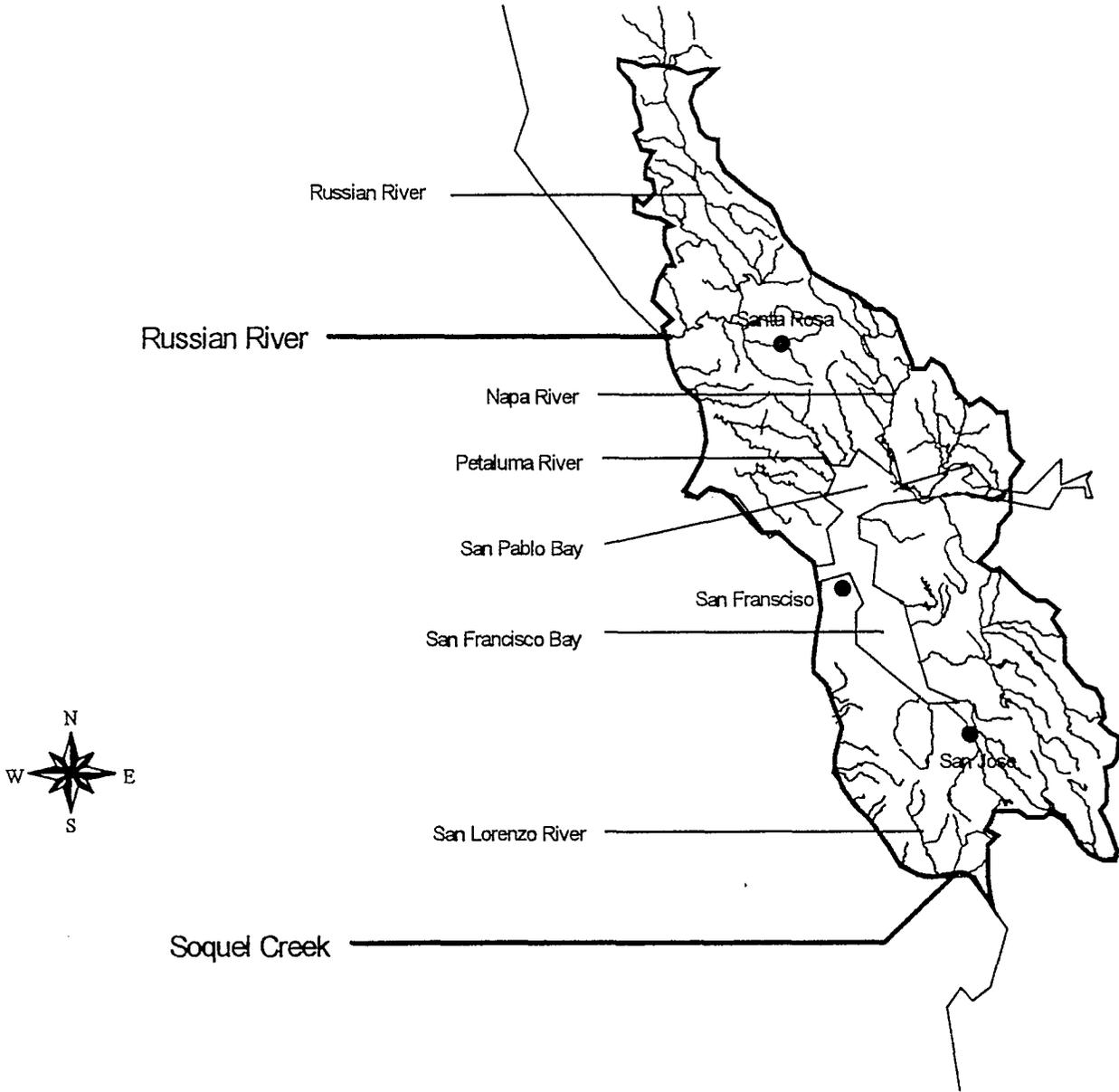
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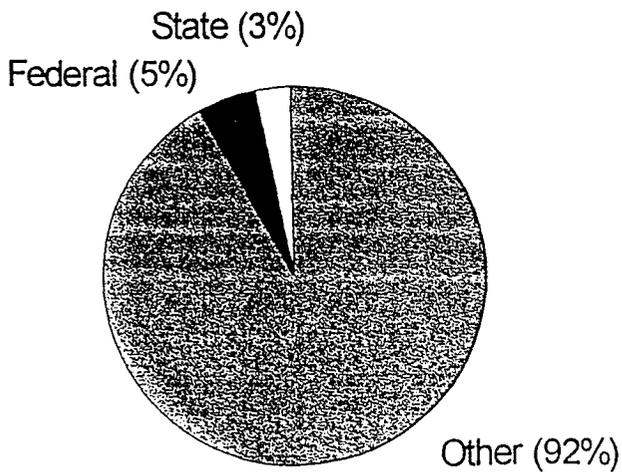
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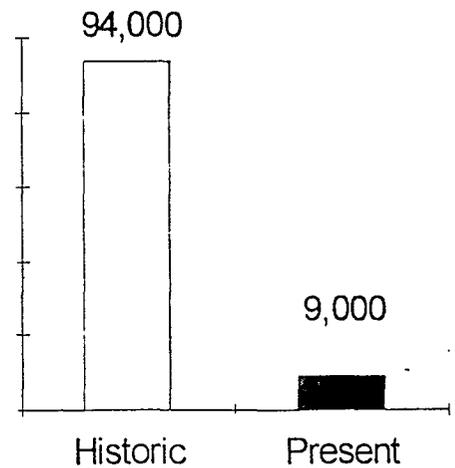
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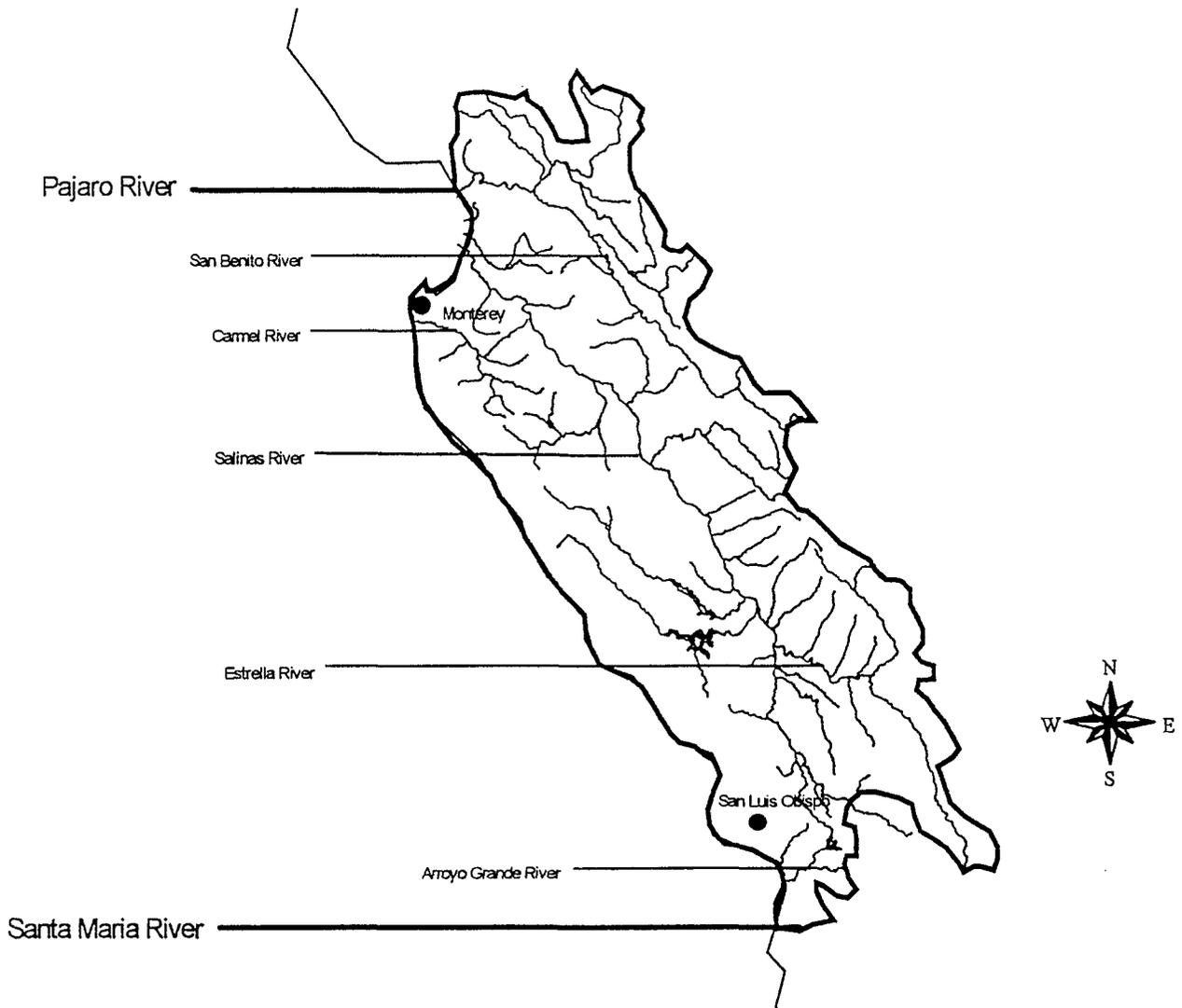
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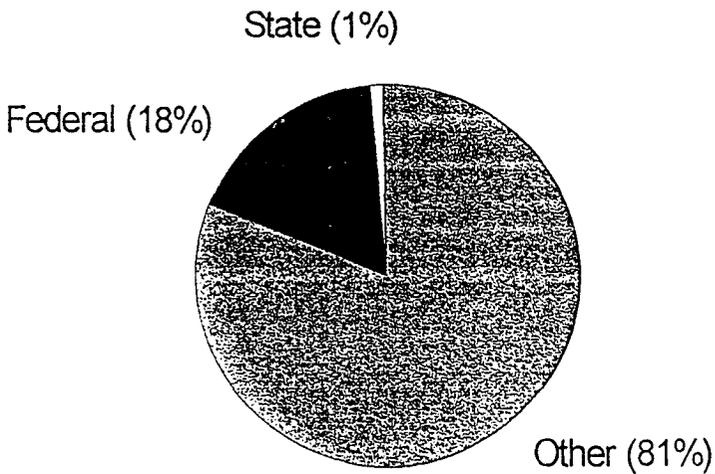
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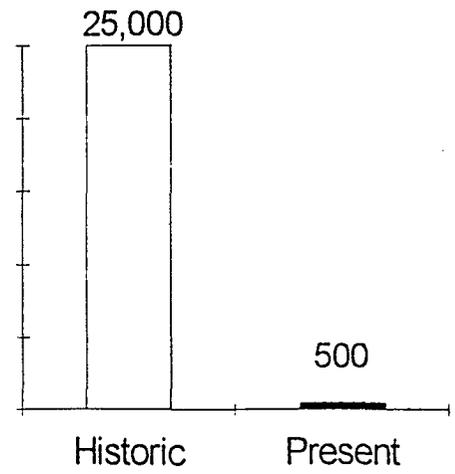
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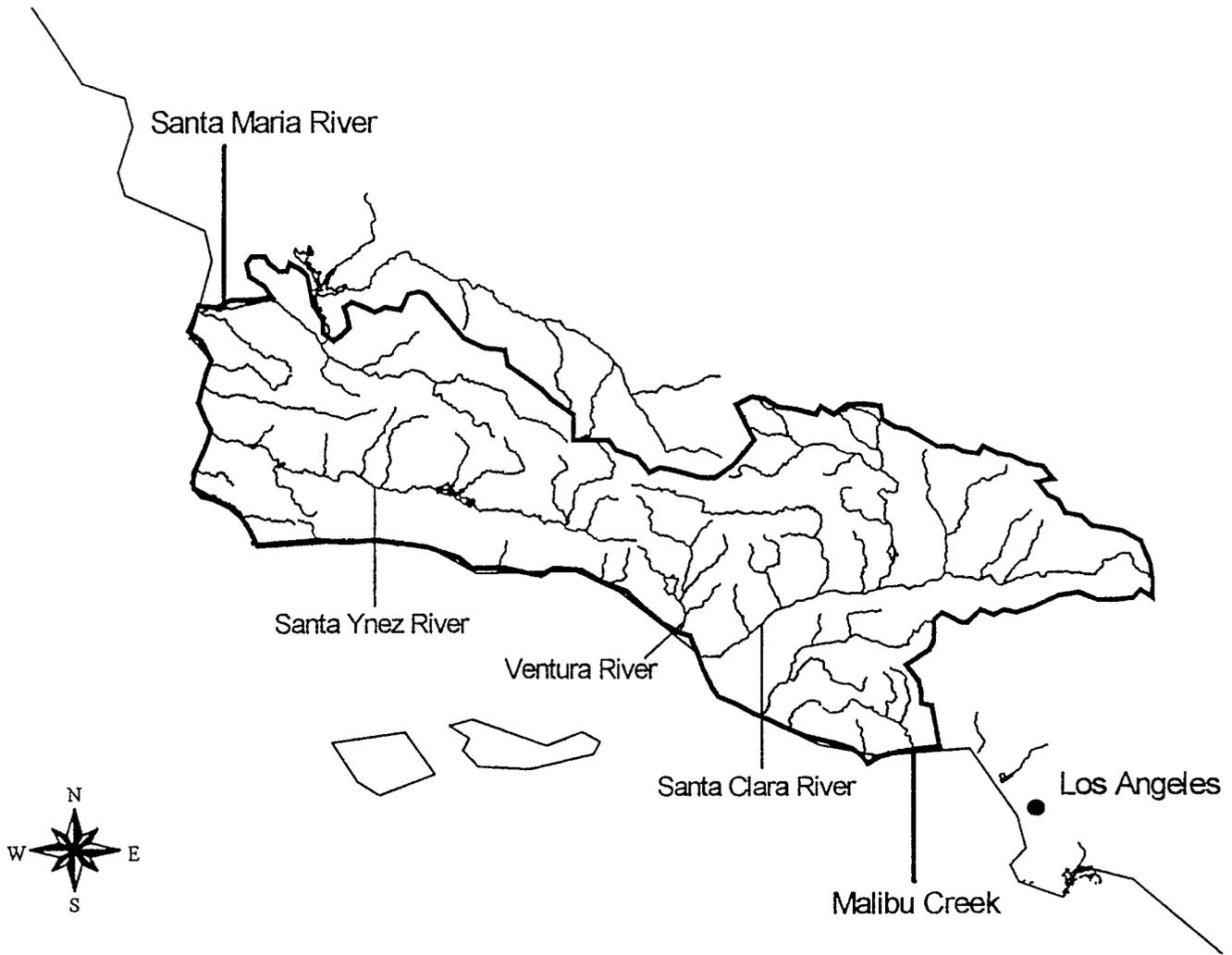
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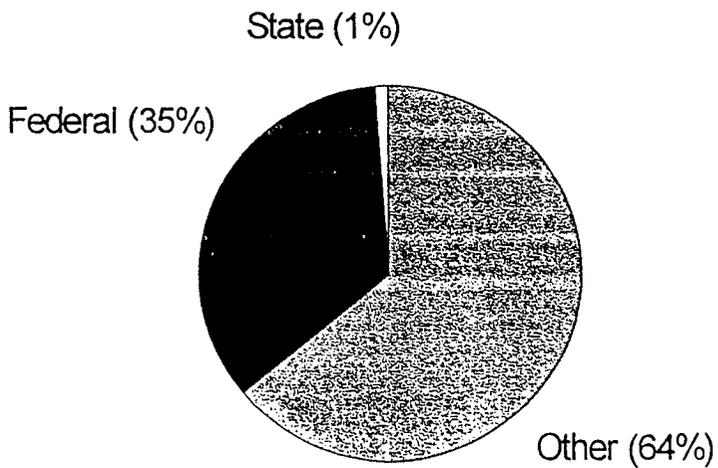
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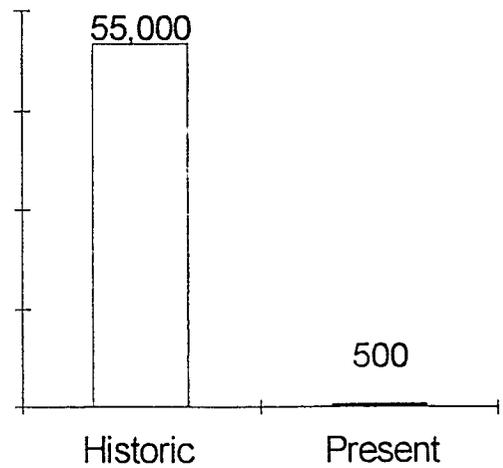
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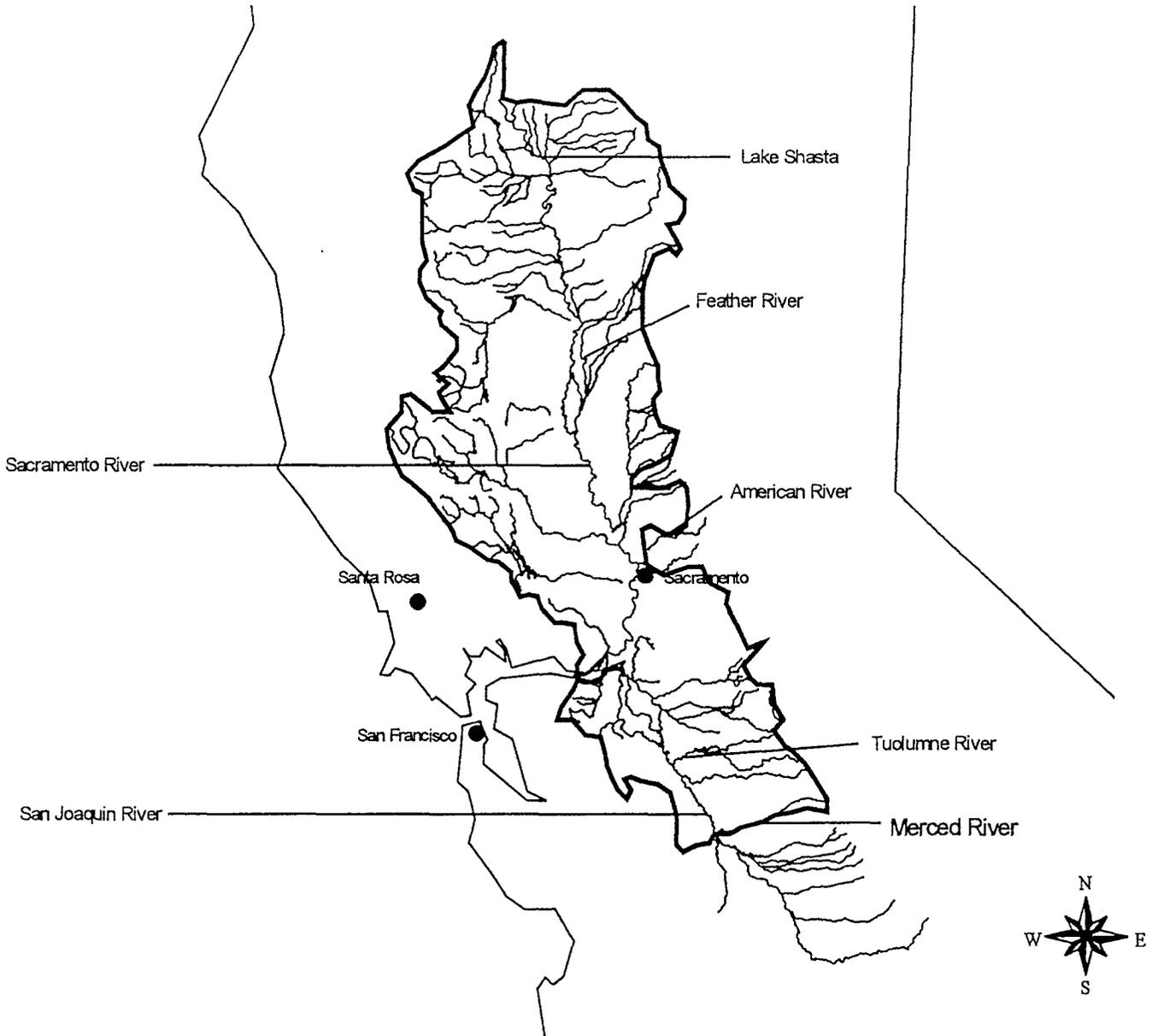
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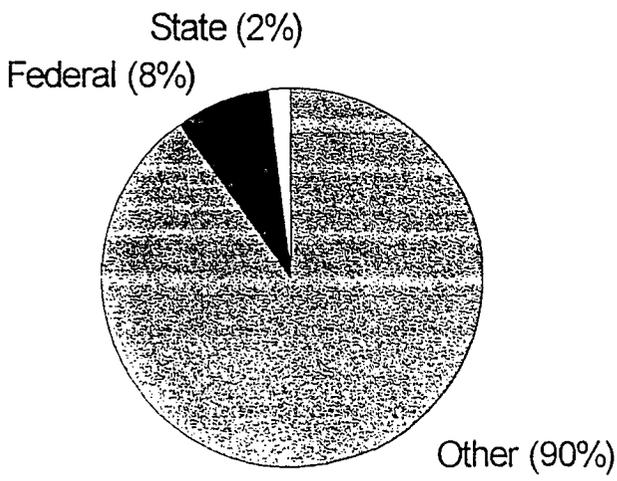
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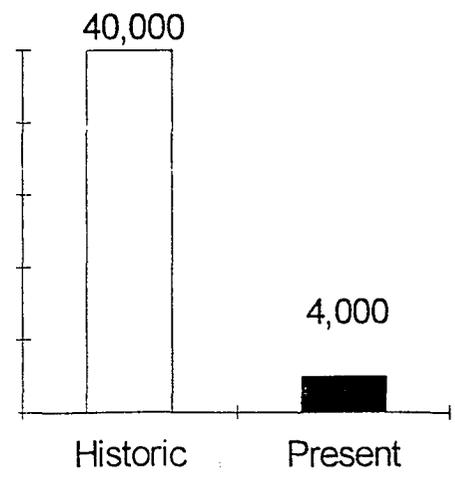
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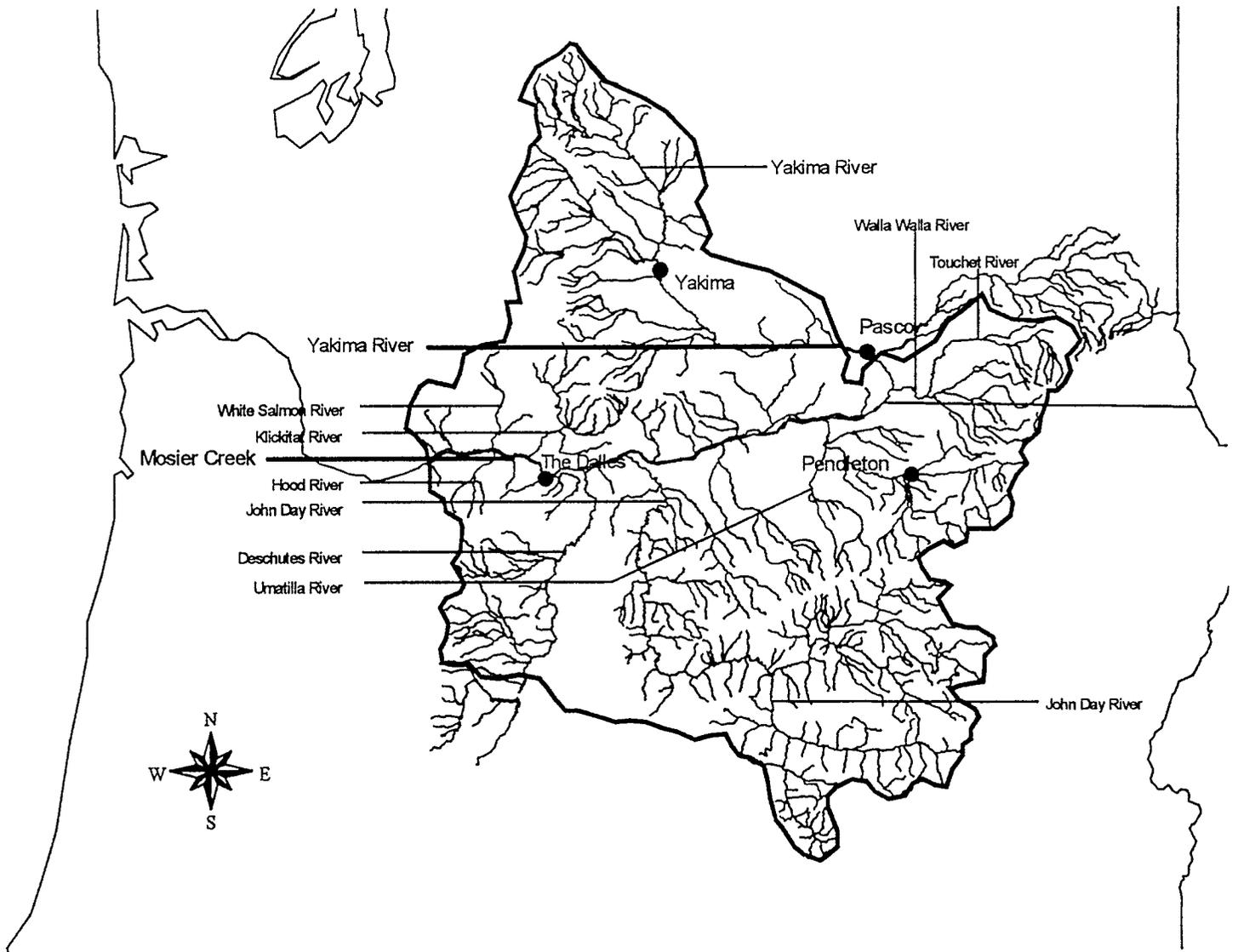
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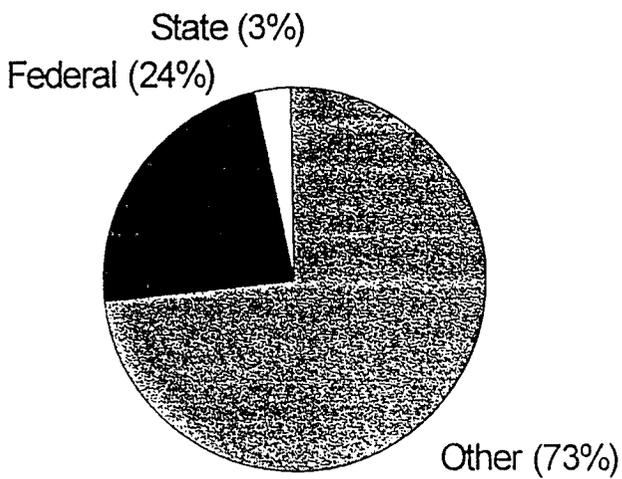
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# ESU 13: Middle Columbia River

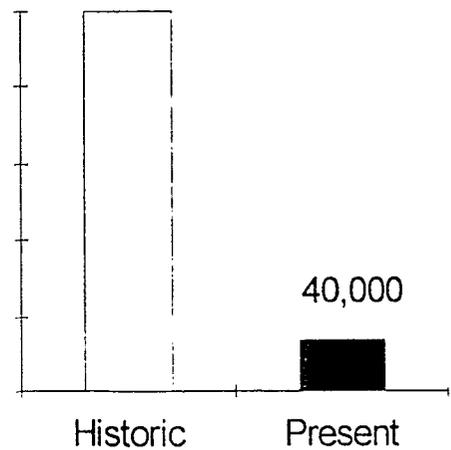


### Land Ownership

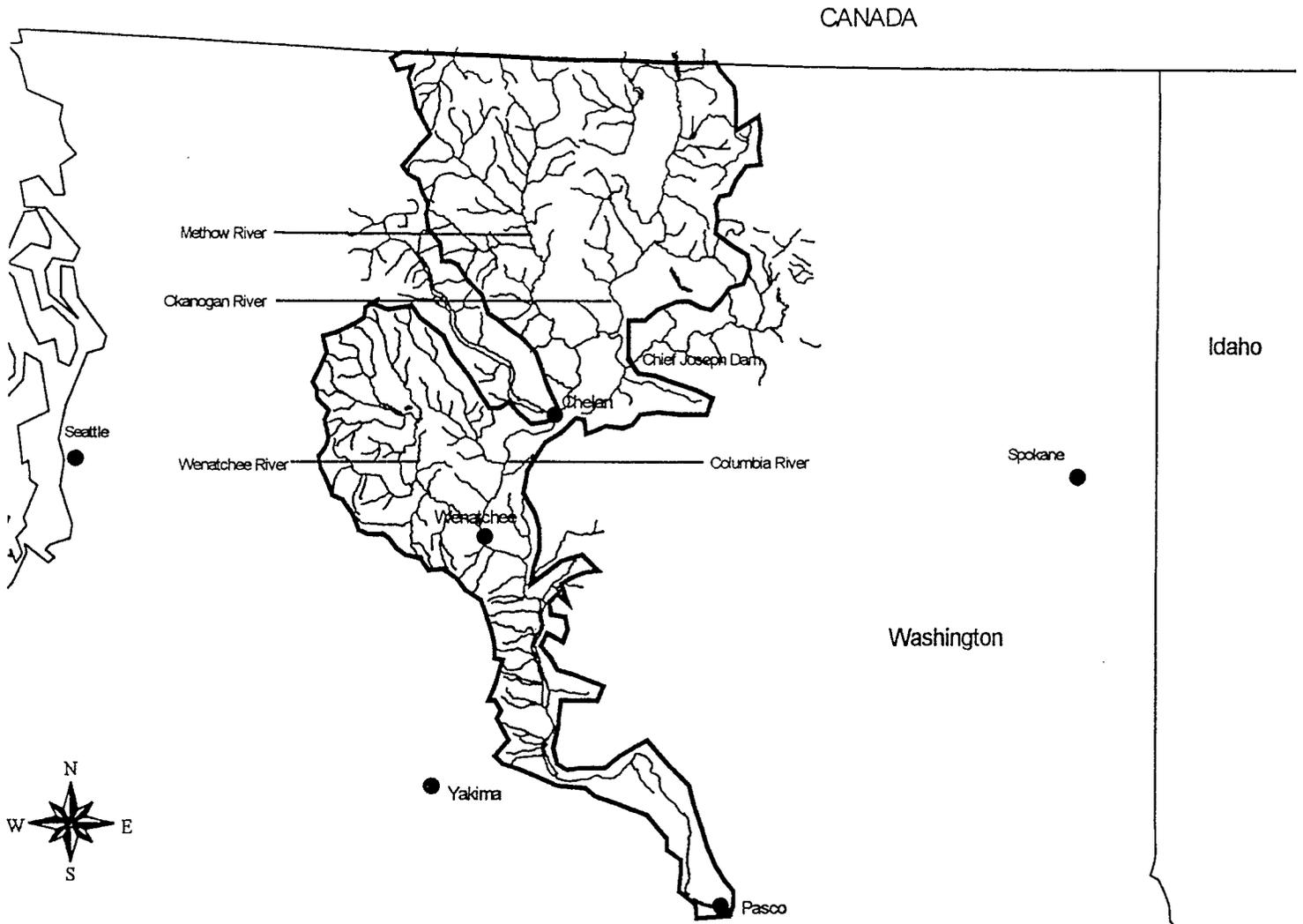


### Abundance

>300,000

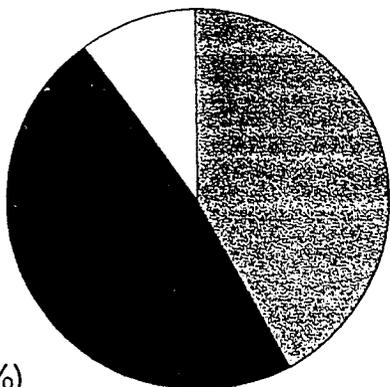


# ESU 14: Upper Columbia River



### Land Ownership

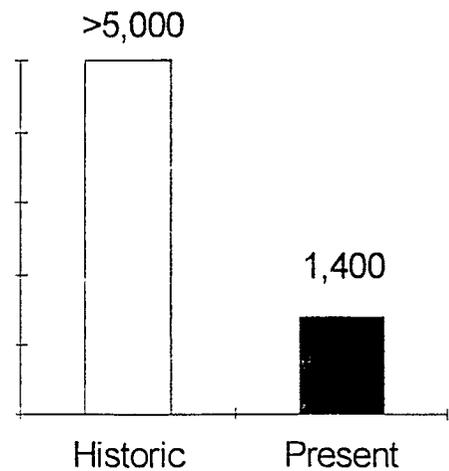
State (10%)



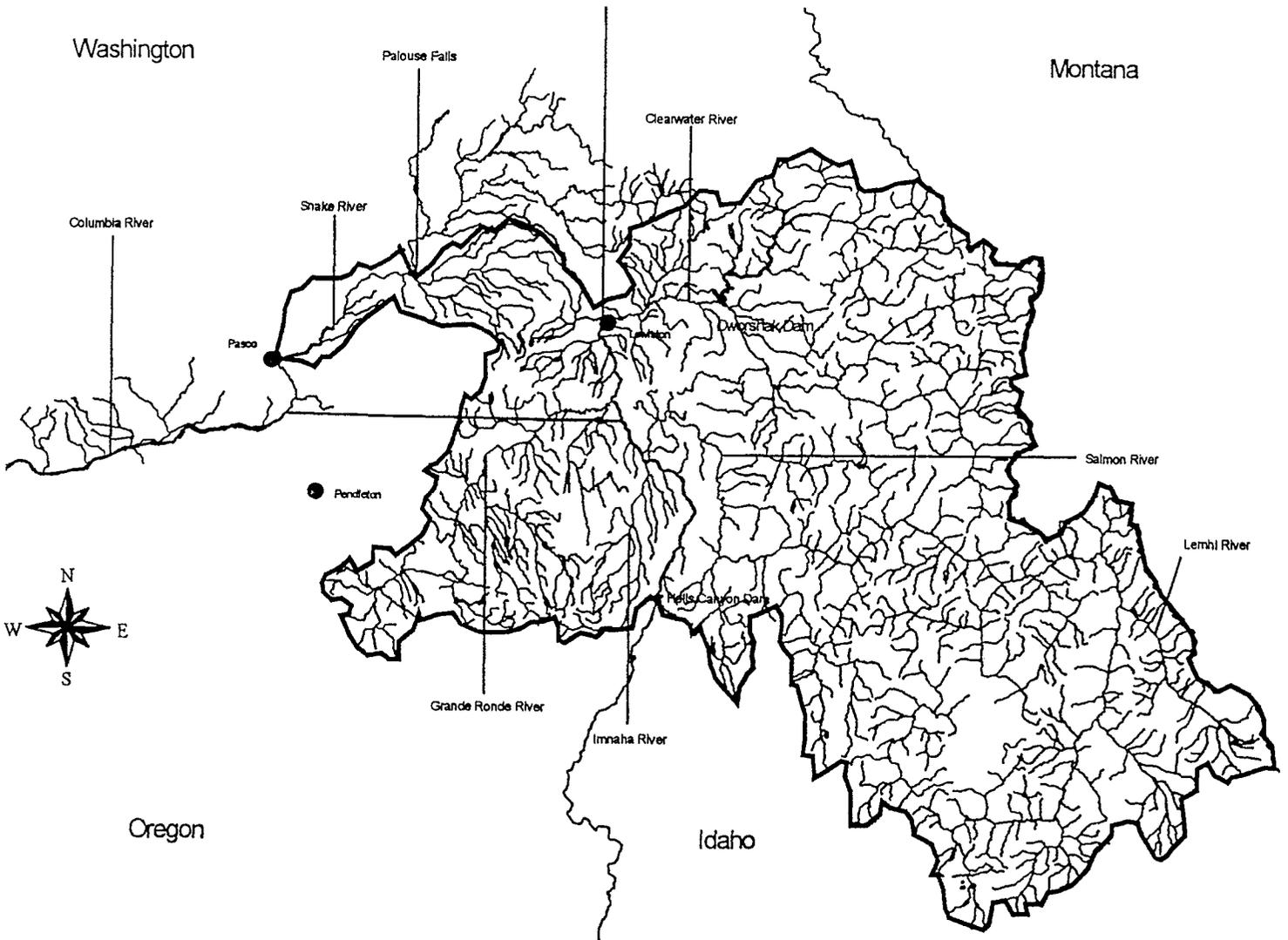
Federal (48%)

Other (42%)

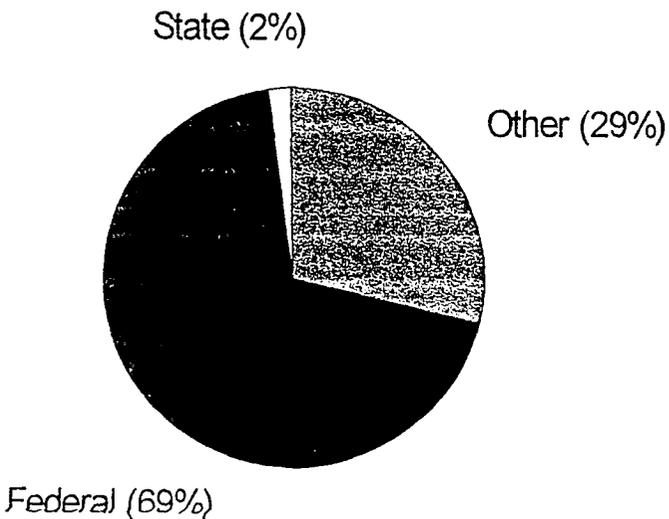
### Abundance



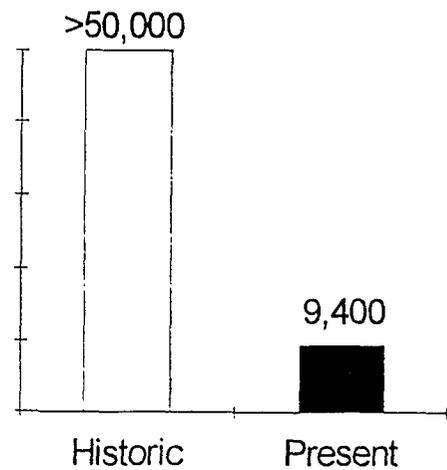
# ESU 15: Snake River Basin



### Land Ownership



### Abundance



## OTHER EFFORTS

Efforts are currently underway to develop an organized, regional salmon conservation strategy which seeks to build upon the significant ongoing efforts within the states. One potential benefit of these efforts is the channeling of interest in fishery issues into a positive, constructive set of programs that could be adopted as a preemptive recovery plan that alleviates the need to list, or, at the very least, can be used under the ESA should listings become necessary. The range of all species of Pacific salmon, steelhead, and cutthroat trout encompasses a large geographic area and a mix of land ownerships, underscoring the need for a cooperative regional approach. Key elements of the Regional salmon conservation strategy which NMFS is presently pursuing include the following:

- **THE NORTHWEST FOREST PLAN** - The Northwest Forest Plan (NFP) serves as the fundamental anchor for salmon, steelhead, and cutthroat trout restoration on Federal lands in Oregon and Washington west of the Cascade Mountains. Proper implementation of its Aquatic Conservation Strategy components and objectives will help ensure that fish and their habitats on Federal lands within the scope of the NFP are restored. In addition, the Federal-state-local machinery established for implementing the NFP will result in better coordination of recovery efforts throughout the range of Pacific salmon, steelhead, and trout. NMFS will use the components, objectives, and intergovernmental coordination fora of the NFP to maintain and restore fish habitat on Federal lands.

For Federal lands outside the scope of the NFP, NMFS will encourage comprehensive management initiatives which espouse the basic tenets of the NFP. Until such initiatives are developed, NMFS will continue to consult with Federal agencies in areas with listed salmon (e.g., Snake and Sacramento River Basins).

- **STATE PROGRAMS AND INITIATIVES** - Salmon, steelhead, and cutthroat trout are important to the Pacific coast communities. These communities and their state and tribal governments have already started designing and implementing programs for restoring watersheds and native, naturally-reproducing salmon, steelhead, and cutthroat trout populations. A regional conservation strategy will build on these efforts and encourage new state and tribal partnerships to facilitate salmon, steelhead, and cutthroat trout conservation. Such a strategy will also encourage and support natural fish restoration efforts on non-Federal lands through the oversight of existing and future watershed councils. The goal of these state efforts is to recover salmon, steelhead, and cutthroat trout and to make listings under the ESA unnecessary. However, should such listings become necessary, NMFS will strive to incorporate existing state programs into its conservation and recovery efforts through the creative use of ESA regulations, Habitat Conservation Plans, cooperative agreements, and Multi-Party Conservation Agreements.
- **HATCHERY AND HARVEST MANAGEMENT** - It will be necessary to review harvest/hatchery programs and policies for compatibility and consistency with a coast-

wide salmon conservation strategy. In particular, NMFS will work with the states, tribes, and other Federal agencies to review elements of wild fish management policies to ensure their compatibility with NMFS' interim policy on artificial propagation of Pacific salmon (58 FR 17573, April 5, 1993). These policies address a suite of management issues, from hatchery production and genetic considerations to harvest regulations, that will be critical components of a coastwide conservation strategy. Many elements of these policies have been successfully implemented and NMFS will seek ways to help the states and tribes apply other elements aimed at protecting, restoring, and monitoring native salmon populations while rebuilding sustainable salmon, steelhead, and cutthroat trout fisheries. The NMFS will also work with the states and tribes to ensure that harvest management plans provide escapement levels that promote sustainable, naturally-reproducing salmon populations.

- **FOR THE SAKE OF THE SALMON INITIATIVE** - The governors of Washington, Oregon, and California, and the tribes of the region are sponsoring a coast-wide initiative called "For the Sake of the Salmon." NMFS has provided technical support and seed funding in anticipation of the need for a regional non-Federal initiative that will serve as the organizational hub of a coast-wide salmon conservation program. Industry and agricultural representatives are critical participants in the effort. NMFS will continue to support the formation of watershed groups throughout the region. Furthermore, NMFS will support the development of a monitoring system that tracks progress towards objectives and will encourage the development of public outreach and education programs relating to salmon and trout conservation.