

Native Fish and Related Resources of Concern

Salmonid Fish Distribution 15

Spawning and rearing areas for coho salmon, spring and fall chinook salmon, and summer and winter steelhead are shown on this map display. Fish distribution data are based on stream surveys conducted by biologists from the U.S. Forest Service (USFS) and the Oregon Department of Fish and Wildlife (ODFW) over several years. The data include only those streams where certain anadromous salmonid species have been observed. Streams not highlighted may or may not have been surveyed, so anadromous or resident fish could be present on these streams.

The map display shows two types of fish habitat areas:

Spawning and rearing: stream reaches where adult fish lay eggs and juvenile fish feed and rest.

Rearing only: stream reaches where juvenile fish feed and rest.

Note: The initial fish distribution data provided by the ODFW was amended by the USFS based on field survey information.

The map display also shows the two fish hatcheries that operate in the watershed: the U.S. Fish and Wildlife Service's Eagle Creek hatchery and ODFW's Clackamas hatchery at McIver Park.

The map display includes artificial and natural impediments to fish passage, such as dams, diversions, major culverts and waterfalls. These data were provided by the ODFW and USFS.

Note: Whether a dam or waterfall actually impedes fish passage depends on whether the dam has fish passage facilities, the size of the waterfall and the fish species trying to pass.

Portland General Electric operates three hydroelectric dams on the Clackamas River mainstem: Faraday (just east of Estacada), River Mill (west of Estacada) and North Fork (upstream from Faraday). These

dams have adult fish passage facilities; Faraday and River Mill also have juvenile fish bypass facilities. The Oak Grove Fork of the Clackamas River has two dams, at Lake Harriet (23 miles east of Estacada) and Timothy Lake (near Mt. Hood). Because natural barriers occur just downstream of these dams, fish passage facilities were not necessary. A few smaller dams are in place on tributaries to the Clackamas.

Waterfalls are the typical natural impediment to fish passage. An example is the 30- to 35-foot waterfall on the Roaring River, three miles from its confluence with the Clackamas River.

Water Quality and Water Supply 16

Information shown on this map is described in three sections: water quality, water-quality limited streams and water supply.

Water Quality

Water quality information shown on the map includes locations of pollution source points regulated by the U.S. Environmental Protection Agency and the Oregon Department of Environmental Quality, as well as mining sites. Pollution source points include Superfund sites, National Pollutant Discharge Elimination System permit locations and Toxic Release Inventory sites.

Superfund sites are areas with severe soil or groundwater contamination that the federal government has designated for clean up or mitigation. The EPA has identified two Superfund sites in the watershed. Not shown on the map, but worth noting, the DEQ has also identified more than 100 clean up sites and more than 600 leaking underground storage tanks throughout Clackamas County.

The National Pollutant Discharge Elimination System (NPDES) is a section of the Clean Water Act that controls point source discharges into a waterbody.

Table 5

Clean Water Act, Section 303(d) listed streams in the Clackamas River watershed 1994-96¹

Stream*	Reason for listing	Supporting data
Clackamas River from mouth to River Mill Dam	Temperature – summer	DEQ data: 76 percent (39 of 51) of summer values exceeded temperature standard (64°F) with exceedences each year and a maximum of 75.2 in water years 1986-1995.
Eagle Creek from mouth to wilderness boundary	Temperature – summer	U.S. Forest Service data: seven-day average of daily maximums of greater than 64°F with eight and 15 days exceeding temperature standard (64°F) in 1991 and 1992 respectively; greater than 64°F with 22 days exceeding standard at sites below and above South Fork in 1990.
Fish Creek from mouth to headwaters	Temperature – summer	U.S. Forest Service data: 7-day average of daily maximums of greater than 64°F with 16 and 5 days exceeding temperature standard (64) in 1992 and 1993 respectively.
	Habitat modification	U.S. Forest Service data: Fish Creek Watershed Analysis

*Note: In general, rivers and streams were listed for their entire length, mouth to headwaters, unless information was available to divide the waterbodies into segments (such as dams, large changes in slope, or major tributaries entering the stream). As a result, the 303(d) list may classify an entire stream or large section of stream as water quality limited, even when some areas are not known to have problems. This approach encourages water quality management on a watershed basis.

All operations that discharge wastewater into rivers or streams must have a permit. There are 13 major (managed by the EPA) and 35 minor (managed by the DEQ) such NPDES permit sites in the watershed.

Toxic Release Inventory (TRI) sites are regulated by the DEQ hazardous wastes program. There are two TRI sites in the watershed. The TRI program governs chemical handling from the point of generation to disposal. Companies that use chemicals must be registered and submit an annual report of what chemicals they use, how much they purchased, and where and how much was disposed of as waste. The difference between the amount purchased and the amount used or disposed of is assumed to be released into the air or water.

Also shown on the map are the locations of mining sites, including 218 stone mines and 37 sand and gravel mines. The level of mining activity at the sites

is not indicated. Mine locations are based on the Mineral Information Layer for Oregon Counties (MILOC) data base from the Oregon Department of Geology and Mineral Industries. Only mines that have permits filed with this department are shown on the map, and many sites could be inactive. Because some of the older locations were defined only by township and section, certain points may be positionally inaccurate up to one mile.

The water-quality monitoring stations shown are maintained by the DEQ, Clackamas River Water; the U.S. Forest Service, the U.S. Fish and Wildlife Service, Portland General Electric and the Clackamas County Department of Utilities. Water-quality monitoring also occurs at all of the surface water intake locations for water utilities. Extensive water-quality data have been collected at each station, including temperature and dissolved oxygen content. For more information about water-quality conditions at particular stations, contact the appropriate agencies.

Water-Quality Limited Streams

The 1972 federal Clean Water Act requires each state to identify waterbodies (streams, rivers, lakes and estuaries) that do not meet water-quality standards. These waters are referred to as "water-quality limited," and the state must include them on a list called the 303(d) list. This list identifies water-quality problems but not the cause, which is investigated later.

Three waterbodies in the Clackamas watershed are on Oregon's 303(d) list of water-quality limited streams, as developed by the DEQ: the Clackamas River from its mouth to the River Mill dam, Eagle Creek from its mouth to the wilderness boundary and Fish Creek (see Table 5 for details).

See the map display called "Stream Status from DEQ 303(d) Designation Process" for more information about water-quality conditions in streams throughout the Clackamas River watershed.

Water Supply

Water supply information shown on the map includes the locations of municipal surface water intakes, stream flow gauges, wells and groundwater limited areas. The four municipal surface water intakes and their locations on the Clackamas River are:

- Clackamas River Water District river mile 3.0
- Lake Oswego Municipal Water river mile 1.0
- Oregon City -
- South Fork Water District river mile 1.0
- Estacada inside city limits

Flow gauges are operated by the U.S. Fish and Wildlife Service, Portland General Electric, Oregon Department of Water Resources (OWRD) and U.S. Geological Survey (USGS). Flow data, including annual peaks and monthly averages, are available for most stations.

The OWRD has 215 permitted wells in the watershed. Wells that are exempt from OWRD permitting are not shown.

Groundwater limited areas are designated by the OWRD, and new uses of groundwater resources are restricted in these areas. Existing uses with an established water right are still permitted to withdraw. The only allowed uses are those that are exempt from permit requirements: domestic uses (less than 15,000 gallons per day for non-irrigation use), livestock watering and industrial or commercial use of less than 5,000 gallons per day.

Stream Status from DEQ 303(d) Designation Process 17

This map display shows the water-quality condition of selected stream segments, based on sampling for a particular parameter such as temperature, pH or dissolved oxygen. Each stream segment can be described as:

- “303 (d) listed,” meaning that the waterbody exceeds the listing criteria for a particular parameter and has been placed on the DEQ’s 303(d) list
- “of potential concern (need additional data),” which means that the DEQ suspects that a stream or river segment may have water-quality concerns, based on the Oregon Statewide Assessment of Nonpoint Sources of Water Pollution (August 1988), but needs additional data to make a decision about including the waterbody on the 303(d) list
- “OK,” which means that the stream segment generally meets water-quality standards for a particular parameter
- no highlighting, which means that the stream may or may not have water-quality problems (either no data have been collected or existing data are not sufficient to determine water-quality conditions).

303(d) Streams

Three waterbodies in the Clackamas River watershed are on the DEQ’s 303(d) list of water-quality limited streams: the Clackamas River from its mouth to the River Mill dam, Eagle Creek from its mouth to the wilderness boundary and Fish Creek.

The water-quality standards violated by Clackamas waterbodies are summer temperature and habitat modification. The DEQ applies different standards depending on the specified beneficial uses for that

waterbody (for example a river used for fish habitat may have different standards than a river used for drinking water). Standards for temperature and habitat modification depend on several factors, but can generally be described as:

Temperature standard: the seven-day moving average of the daily maximum shall not exceed 64 degrees F (most streams) or 55 degrees F (during salmon spawning, egg incubation and fry emergence).

Habitat modification standard: Cited information from a resource management agency demonstrating that a beneficial use (such as fish populations) has been degraded because of habitat loss.

Note: In general, rivers and streams were listed for their entire length, mouth to headwaters, unless information was available to divide the waterbodies into segments (such as locations of dams, large changes in slope, or major tributaries entering the stream). As a result, the 303(d) list may classify an entire stream or large section of stream as water-quality limited, even when some areas are not known to have problems. This approach encourages water-quality management on a watershed basis.

“Of Potential Concern” and “OK” Streams

In some areas, the DEQ suspects that a stream or river segment may have water-quality concerns, but not enough data are available to list the waterbody on the 303(d) list. These areas are identified as “of potential concern (need additional data). The DEQ will continue to gather water-quality data on these streams.

Other stream segments have been classified as “OK” because they generally meet water-quality standards for a particular parameter. It is important to note that a stream listed as “OK” for one parameter may be classified as “of potential concern” or even “303(d) listed” for other parameters. For example, the lower Clackamas River (mouth to River Mill dam) is described as “OK” for bacteria, dissolved oxygen,

pH and chlorophyll-a but is shown as “of potential concern” for sediment and “303(d) listed” for temperature.

Streams that are not highlighted on any of the three maps may or may not have water-quality problems. In these cases, not enough data have been collected to classify the stream for any particular parameter.

The criteria for 303(d) listing depend on several factors. For precise standards and listing criteria, consult the DEQ’s 1994/1996 303(d) List of Water Quality Limited Waterbodies and Oregon’s Criteria Used for Listing Waterbodies.

Note: The digital data for these maps are in draft form and should not be used to pinpoint exact locations of water-quality problems. Where the GIS map and the 303(d) list differ, the 303(d) list takes precedence.

Designated Special Areas 18

This map shows those lands and rivers that have special management designations, including federal lands related to wildlife and spotted owl habitat and areas classified as special environmental resources.

The 1994 Northwest Forest Plan defined management strategies and goals for the more than 24 million acres of northern spotted owl range occurring on federal land. Six types of land allocation categories occur in the Clackamas River watershed: administratively withdrawn areas, late successional reserves, riparian reserves, managed late successional reserves, congressionally reserved areas and matrix lands (Northwest Forest Plan/Record of Decision). The land allocation determines whether timber harvest is restricted in those areas. Lands inside the Mt. Hood National Forest are also governed by the Mt. Hood National Forest Plan.

Administratively withdrawn areas: areas that include recreational and visual areas, back country and other areas not scheduled for timber harvest.

Late successional reserves: areas designed to serve as habitat for late-successional and old-growth related species, including the northern spotted owl. These areas will maintain a functional, interactive, late-successional and old-growth forest ecosystem.

Riparian reserves: areas along all streams, wetlands, ponds, lakes and unstable or potentially unstable areas. The main purpose of riparian reserves is to achieve and maintain riparian and aquatic habitat conditions for the sustained, long-term production of fish, selected wildlife and plant species and high quality water. The required width of the riparian reserve depends on the type of waterbody and whether it is fish-bearing.

Managed late successional reserves: areas of core habitat for spotted owls, including nesting areas. These areas are not shown on the map.

Congressionally reserved areas: lands that include designated Wilderness Areas, National Parks and Wildlife Refuges and other areas with special uses. In the Clackamas watershed, the Congressionally reserved lands are Wilderness Areas and Wild and Scenic rivers (see next page for more information). Wilderness Areas are managed as natural areas with hiking trails and limited recreation. In these areas, management activities are restricted to those allowed under management plans for each respective wilderness area as well as overall wilderness guidelines. No tree harvesting or road building is allowed. There are two Wilderness Areas in the watershed. The Bull of the Woods Wilderness Area preserves 34,900 acres of undisturbed forestland, while Eagle Creek flows out of the western boundary of the Salmon-Huckleberry Wilderness, which encompasses 44,600 acres (Oregon Department of Fish and Wildlife).

Matrix lands: those federal lands in northern spotted owl range, but not designated as protected. The goal of matrix land is to provide lumber, wood fiber and other products on a regulated basis, while retaining some forest land to allow wildlife to travel through

the area. Because matrix lands are designated for timber harvest, they are not shown on this map (but are shown on the Existing Land Use map).

Although certain thinning and salvage activities are allowed in the reserves, programmed timber harvest will only occur on matrix lands and must comply with conservation guidelines.

Also shown on the Designated Special Areas map are Tier 1 and Tier 2 key watersheds, national wetland inventory sites, aquatic diversity areas, State Scenic Waterways, National Wild and Scenic Rivers, and essential salmon habitat.

Tier 1 and Tier 2 watersheds: watersheds designated by the Northwest Forest Plan's Record of Decision as containing (a) habitat for potentially threatened species or stocks of anadromous salmonids, or (b) greater than six square miles of high-quality water and fish habitat. Tier 1 watersheds contribute directly to the conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential for being restored as part of a watershed restoration program. In the Clackamas River basin, there are five Tier 1 watersheds: the Upper Clackamas River; Collawash River; Hot Springs Fork/Collawash River; Fish Creek and Roaring River. Tier 2 watersheds do not contain at-risk fish stocks, but they are important sources of high-quality water. Eagle Creek is a Tier 2 watershed. Once a federal agency has completed a watershed analysis for the area, parts of these watersheds may be included in matrix lands (Record of Decision). Tier 1 and Tier 2 key watersheds overlay federal land use allocations.

National Wetlands Inventory: a wetlands inventory produced by aerial photo interpretation by the U.S. Fish and Wildlife Service. Because aerial photos were used to interpret wetland sites, some smaller wetlands were not mapped.

Aquatic diversity areas (ADAs): areas designated by the Oregon Chapter of the American Fisheries Society as critical for protecting Oregon's indigenous (native) aquatic fauna. Two major types of aquatic ecosystems were designated. Type 1 ADAs are ecosystems in relatively healthy condition that are among the best remaining examples of a particular ecosystem type. Type 2 ADAs are ecosystems that contain aquatic species or locally adapted stocks that are in imminent danger of extinction. Three Clackamas River subwatersheds, the Upper Clackamas River; the Collawash River and the Hot Springs Fork Collawash River; are listed as Type 1 ADAs.

Several programs, such as the governor's Coastal Salmon Initiative (1997), have used ADA information to identify sensitive watersheds, underscoring the fact that these areas are important to protect and restore. In addition, the Northwest Forest Plan's Aquatic Conservation Strategy has many of the same objectives as the ADA strategy and covers all federal lands. However, only federal agencies currently provide special protection to these areas.

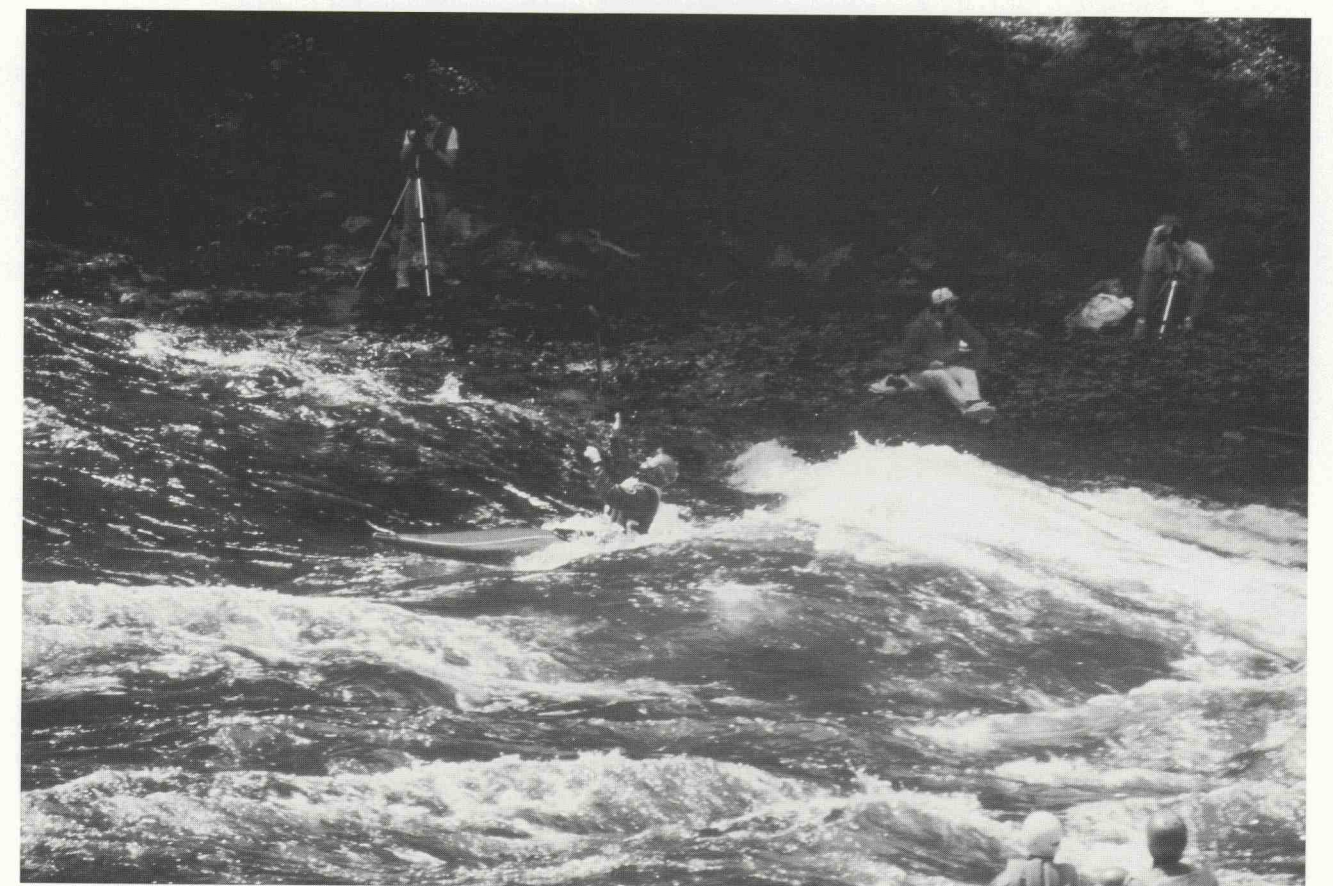
State Scenic Waterway: river or stream segments designated by the state of Oregon and administered by the Oregon Parks and Recreation Department. Four sections of the Clackamas River are designated as State Scenic Waterways: 12 miles of the North Fork-Clackamas River; four miles of South Fork-Clackamas River; the mainstem from Ollalie Lake Scenic Area to North Fork reservoir (54 miles) and the mainstem from River Mill Dam to Carver (12 miles).

State statutes prohibit construction of dams within a designated reach of State Scenic Waterway. In addition, the Oregon Parks and Recreation Department reviews permits for proposed uses and activities within a quarter mile on either side of a designated reach. Although timber harvesting, aggregate mining and development are rarely prohibited, the department may place conditions on permits to decrease harmful environmental effects.

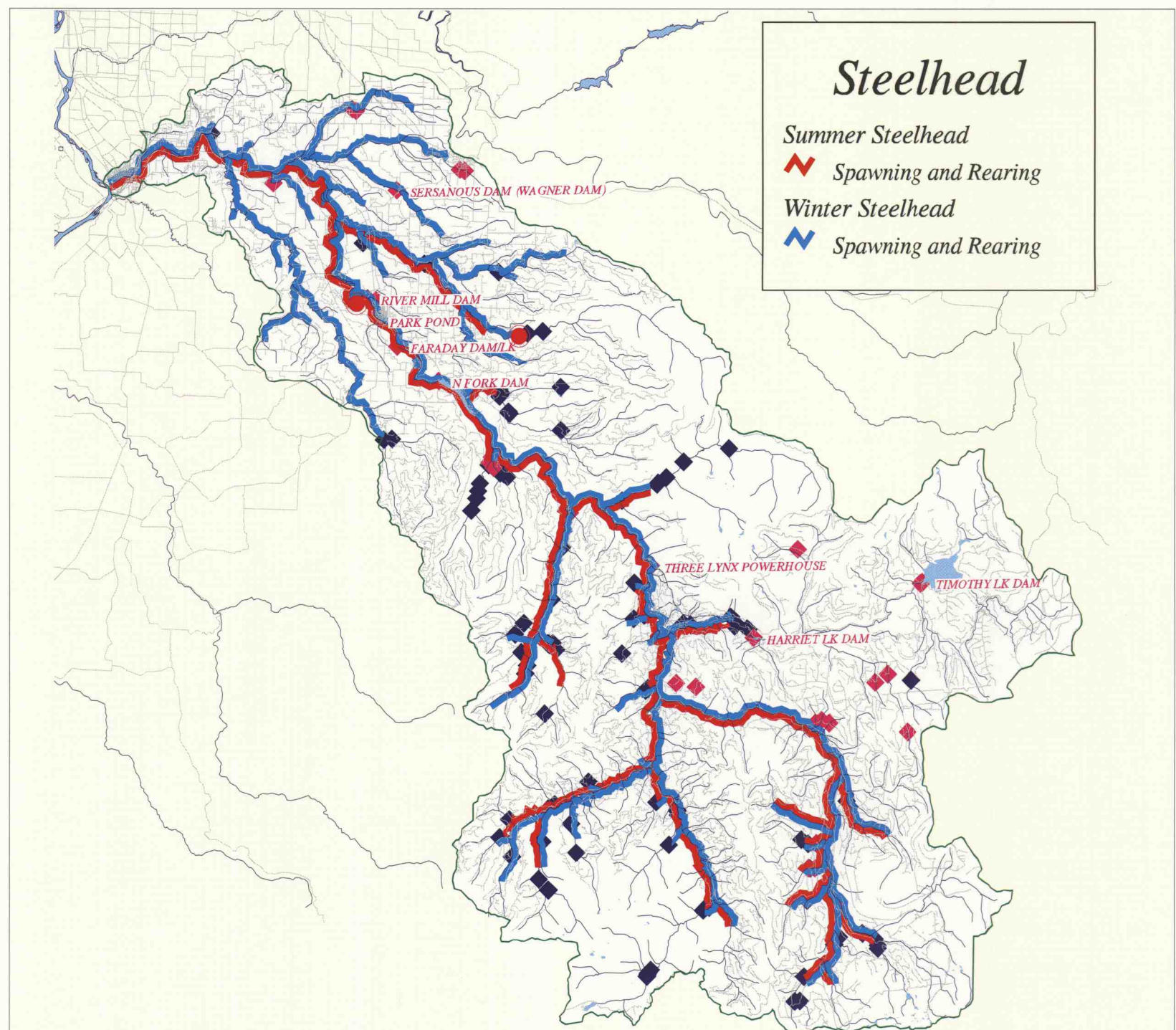
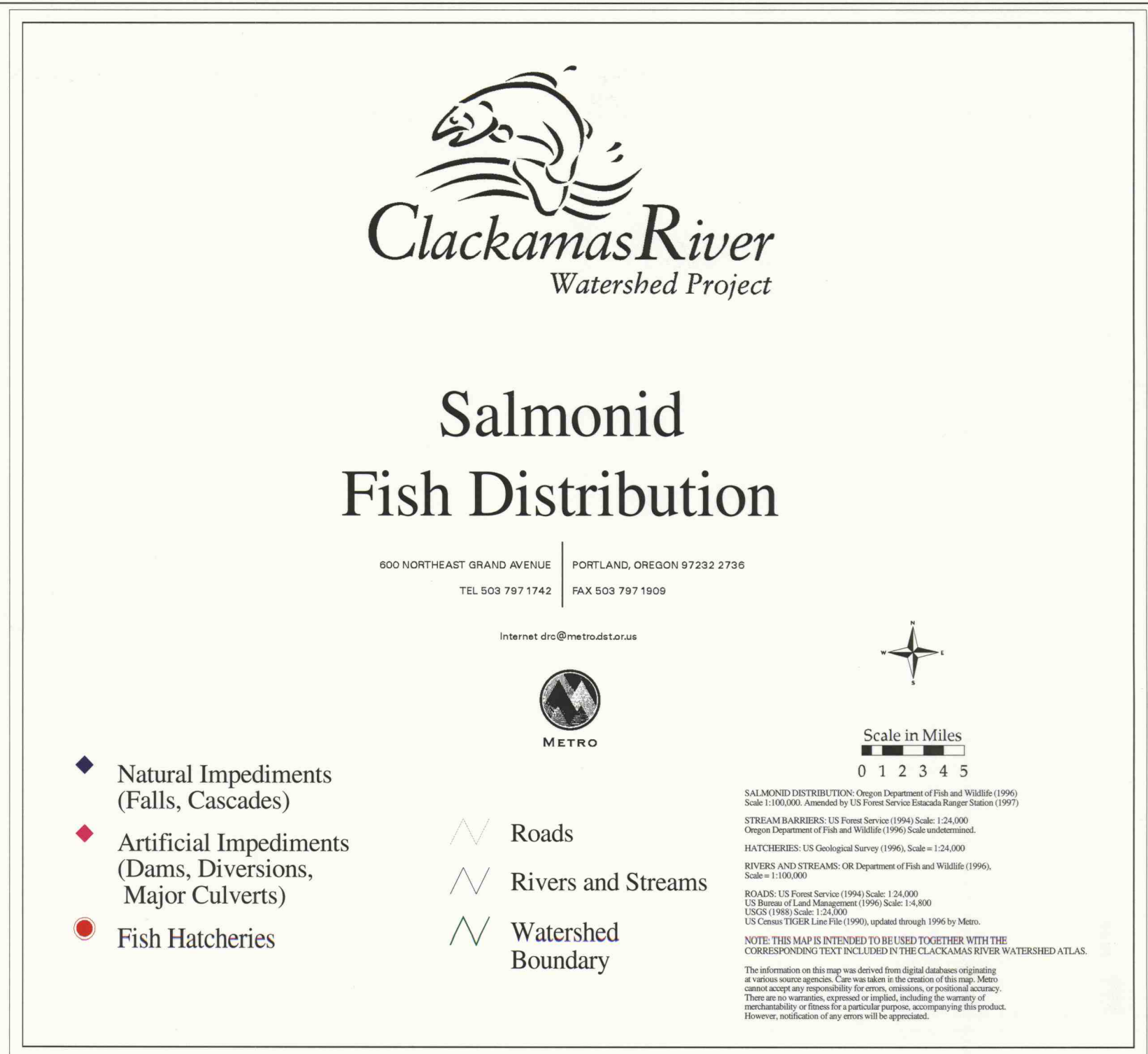
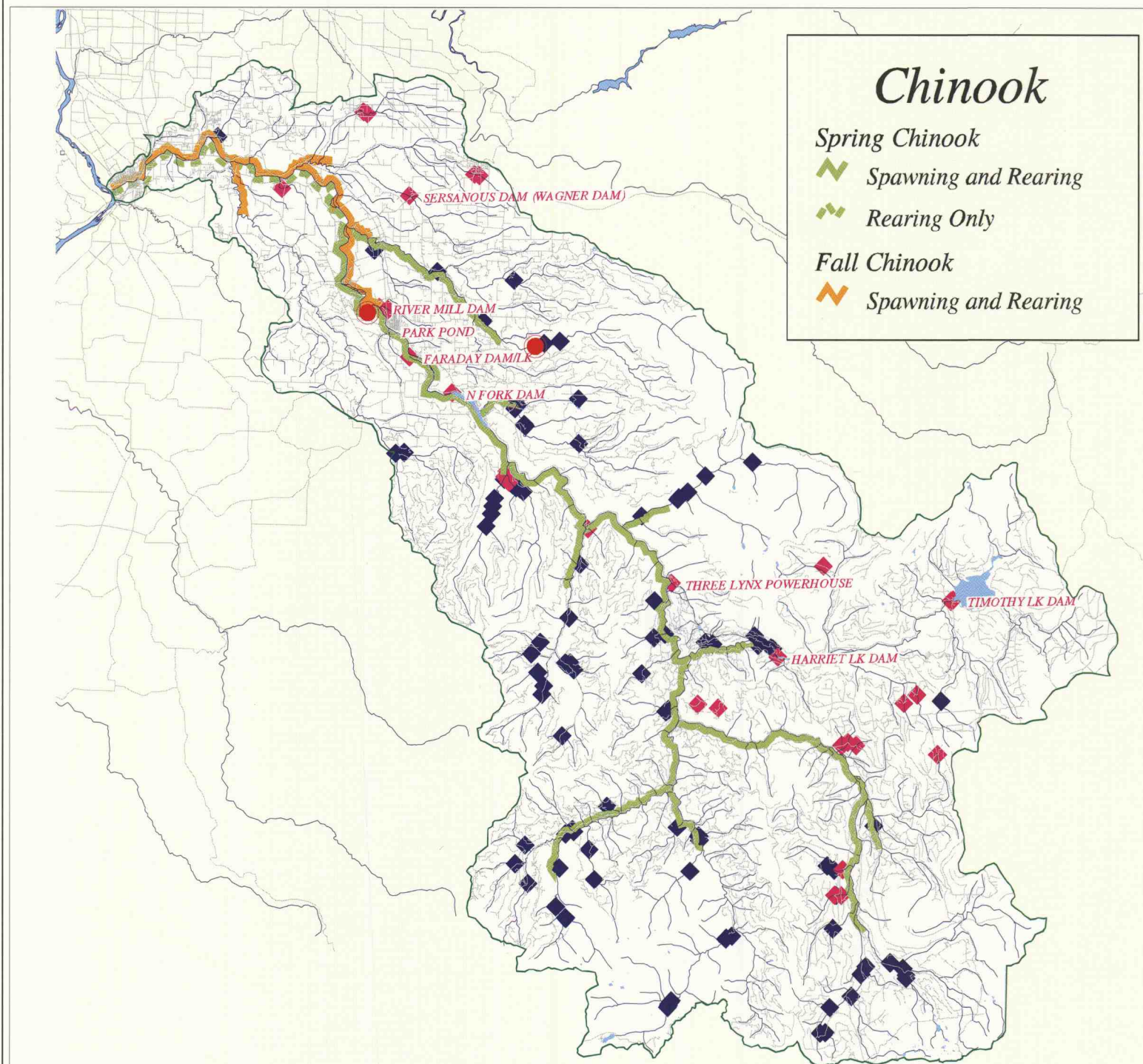
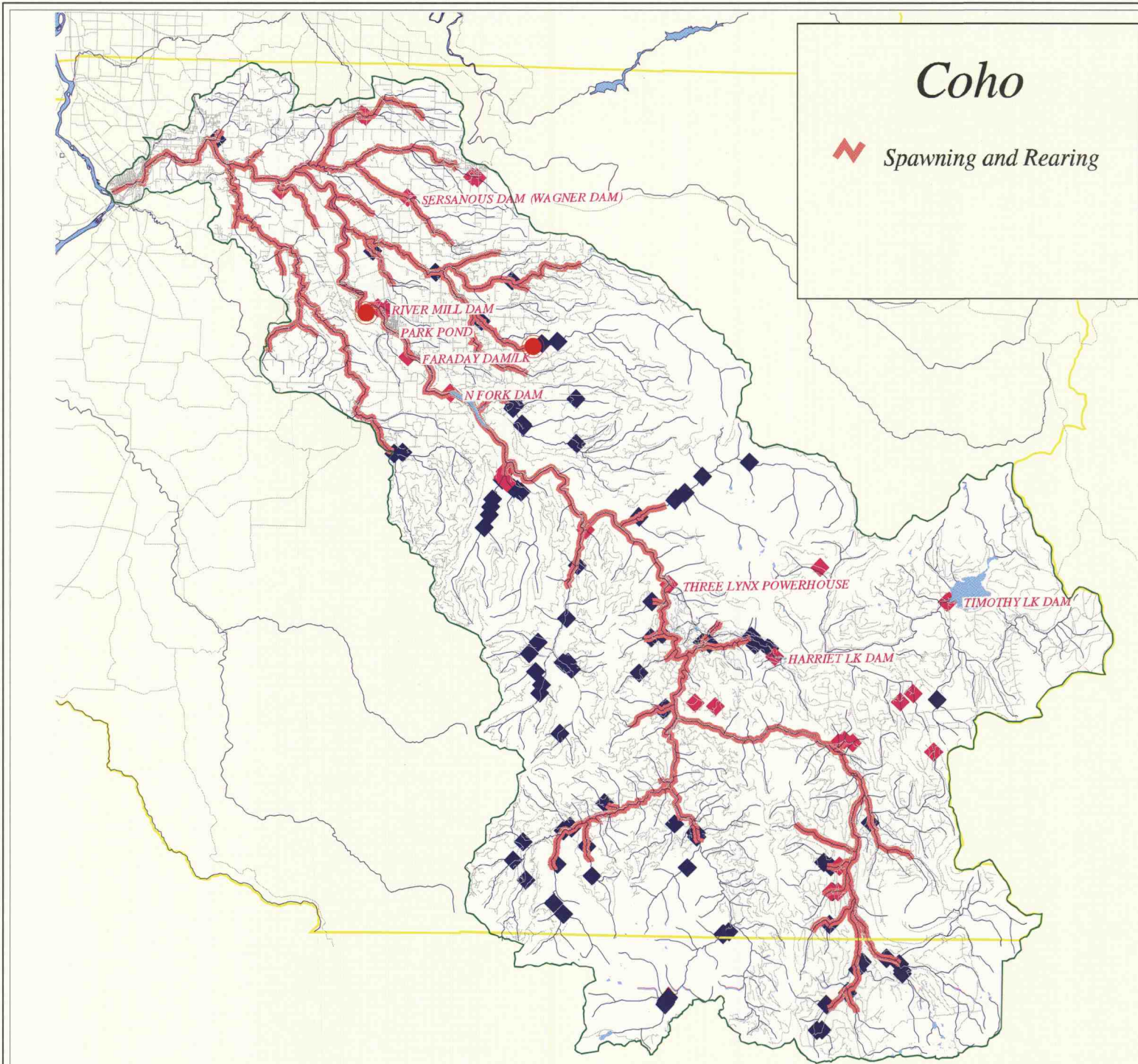
Federal Wild and Scenic River: In 1968, the U.S. Congress enacted the National Wild and Scenic Rivers Act to establish a system for preserving outstanding free-flowing rivers. In 1988, Congress incorporated approximately 50 miles of the Clackamas River into the federal wild and scenic river system. The "wild and scenic" portion of the river runs from Big Spring, in the Olallie Lake Scenic Area, to Big Cliff, just upstream of North Fork Reservoir. The "outstandingly remarkable values" recognized by Congress for the Clackamas River were superb fishery, scenery and recreation. More than 14 miles of the Roaring River are also designated as a "wild and scenic river."

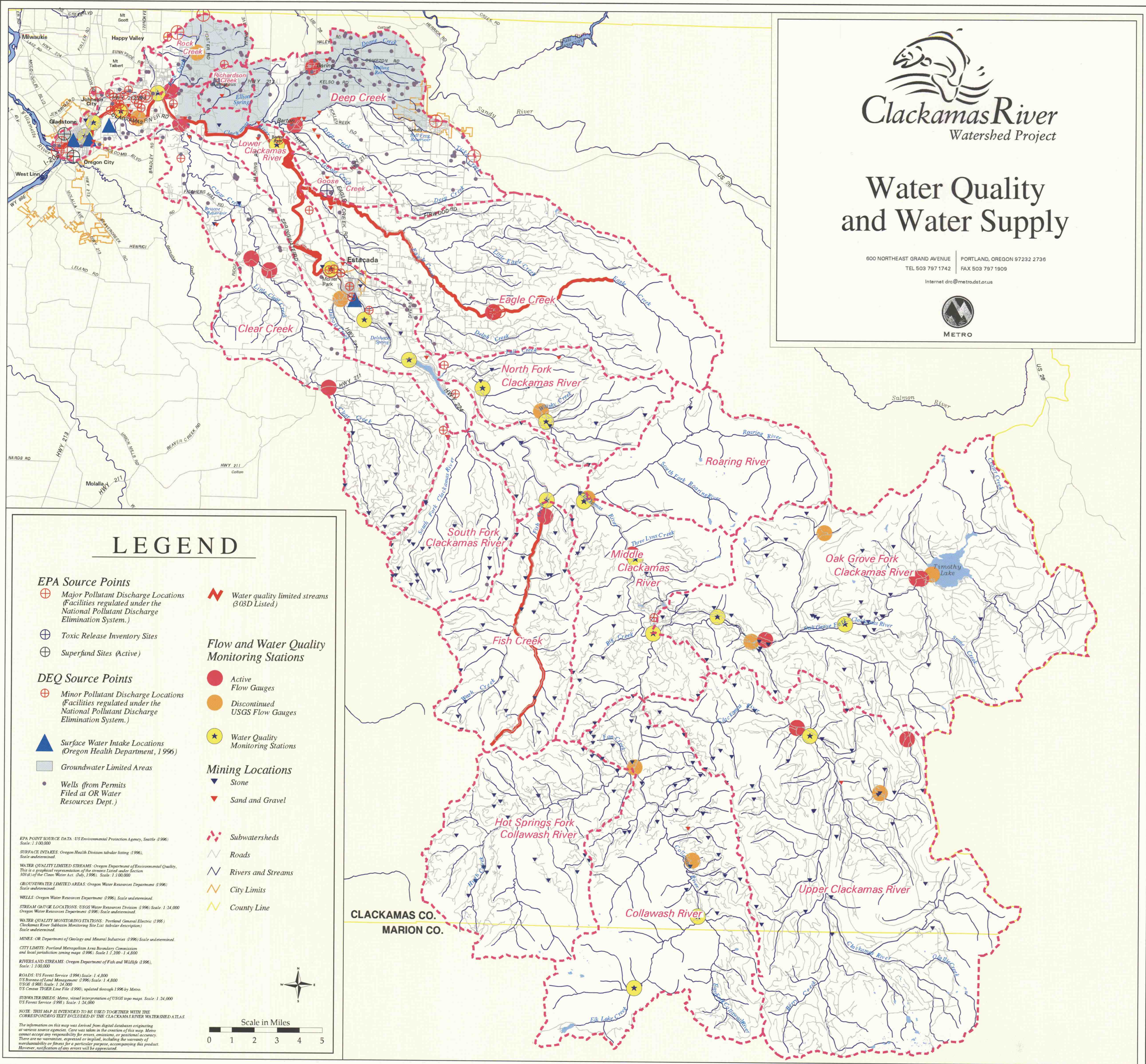
The purpose of the wild and scenic designation is to manage designated segments by protecting their outstandingly remarkable values and maintaining and enhancing the natural integrity of river-related values. New project proposals are evaluated for their potential to directly or adversely affect the attributes that made the river eligible for designation. The U.S. Forest Service has prepared management plans to protect and enhance the special values of the wild and scenic portions of the Clackamas and Roaring rivers.

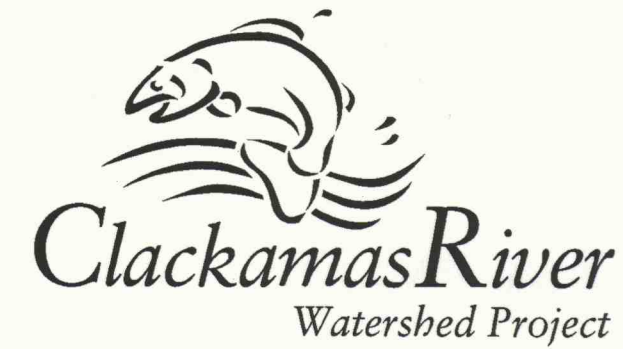
Essential Salmon Habitat: as defined in Oregon state statute, these areas of "essential indigenous anadromous salmonid habitat" mean habitat that is necessary to prevent the depletion of indigenous, or native, anadromous salmonids during their life stages of spawning and rearing. The Oregon Division of State Lands, in consultation with the Oregon Department of Fish and Wildlife, identifies and maps essential salmon habitat. Approximately 225 miles of essential salmon habitat have been mapped in the Clackamas watershed. Fill and removal activities in waterways designated as "essential salmon habitat" are subject to stricter regulations pursuant to Oregon Administrative Rules (OAR) 141-102-000 to 141-102-100.



The Clackamas River provides many recreational opportunities, from fishing to boating. This kayaker is shooting through Bob's Hole, a set of rapids known for its special hydraulics.







Stream Status from DEQ 303(d) Designation Process

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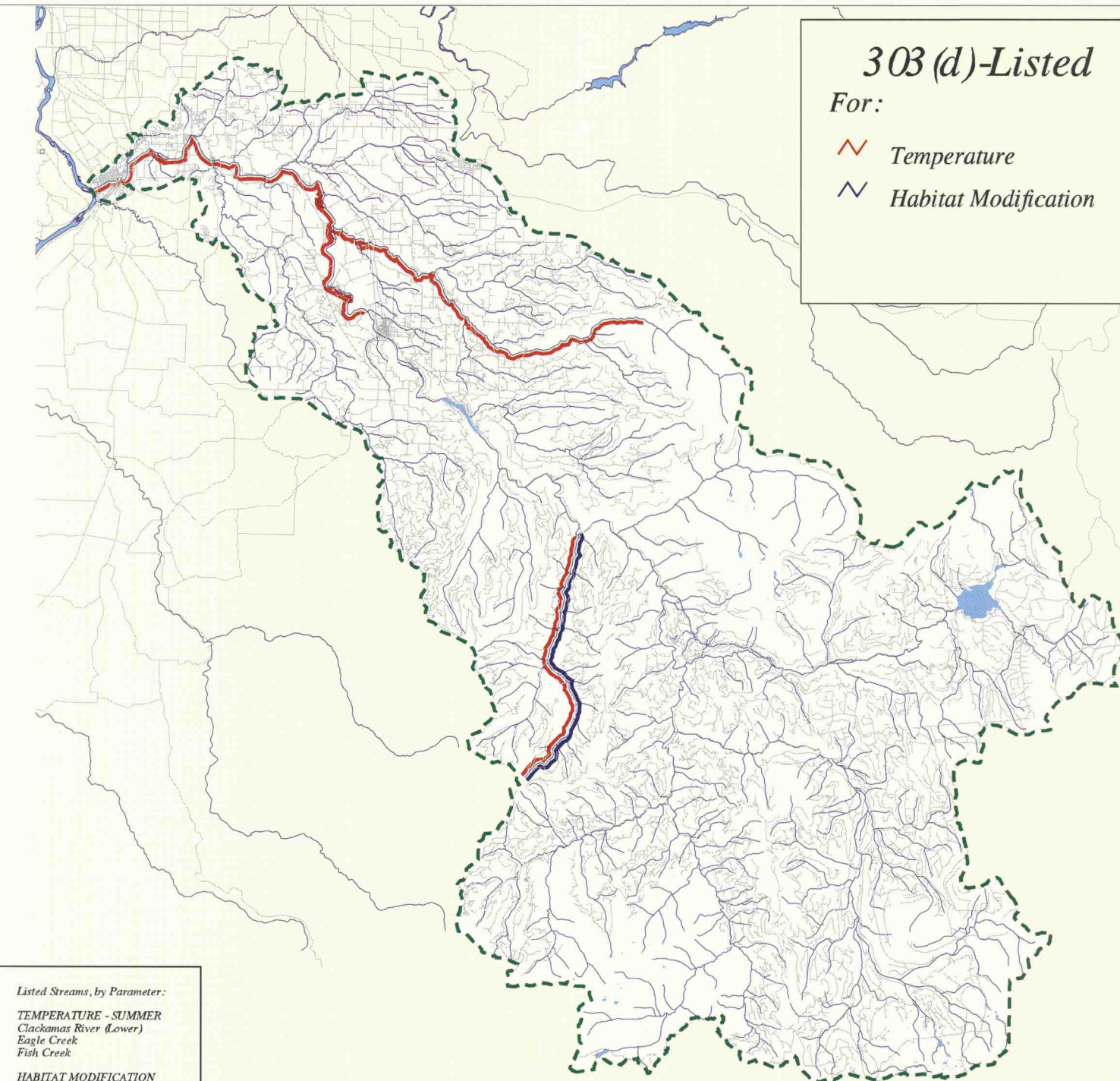
Scale in Miles
0 1 2 3 4 5

- Roads
- Rivers and Streams
- Watershed Boundary

WATER QUALITY LIMITED STREAMS: Oregon Department of Environmental Quality.
This is a graphical representation of the streams listed under Section 303(d) of the Clean Water Act (July, 1996). Scale: 1:100,000.
STREAM STATUS: Information taken from the 1994/1996 Oregon DEQ 303(d) List Decision Matrix. Refer to the 303(d) List as document of record.
This digital representation of stream status is DRAFT, as it has not been reviewed by EPA or ODEQ water quality staff. Users are advised that these maps should not be used without the 303(d) List.
Scale: 1:100,000
NOTE: Streams not highlighted may not have been surveyed, or may have been surveyed only for certain parameters. No conclusions should be drawn about the status of non-highlighted streams. Streams highlighted as "OK" or "Of Potential Concern", for any parameter, may still be 303(d)-listed for other parameter(s).
RIVERS AND STREAMS: Oregon Department of Fish and Wildlife (1996). Scale: 1:100,000
ROADS: US Forest Service (1994) Scale: 1:4,800
US Bureau of Land Management (1996) Scale: 1:4,800
USGS (1988) Scale: 1:24,000
US Census Tiger Line File (1990), updated through 1996 by Metro.

303 (d)-Listed
For:

- Temperature
- Habitat Modification

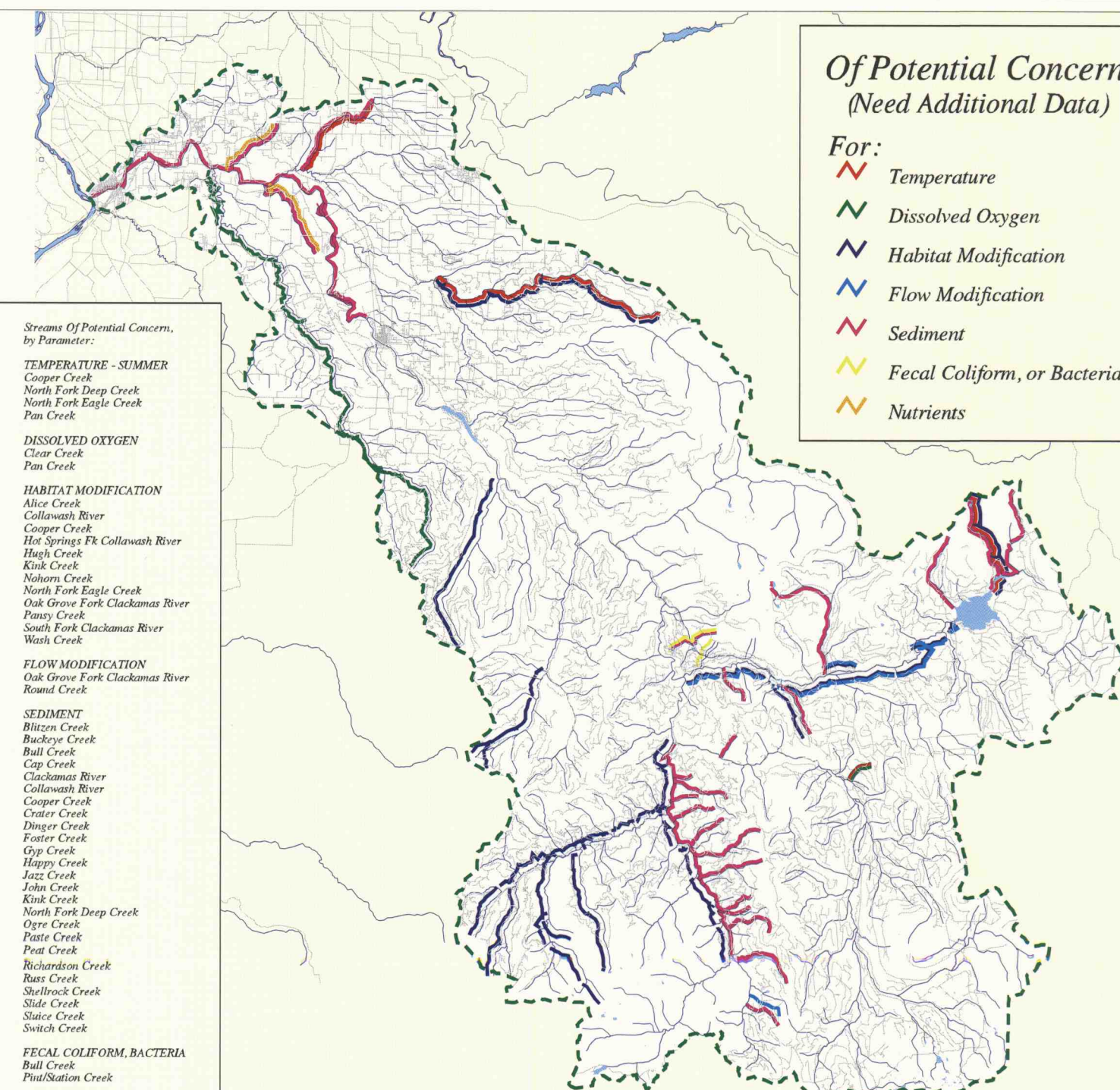


Listed Streams, by Parameter:
TEMPERATURE - SUMMER
Clackamas River (Lower)
Eagle Creek
Fish Creek
HABITAT MODIFICATION
Fish Creek

Of Potential Concern
(Need Additional Data)

For:

- Temperature
- Dissolved Oxygen
- Habitat Modification
- Flow Modification
- Sediment
- Fecal Coliform, or Bacteria
- Nutrients

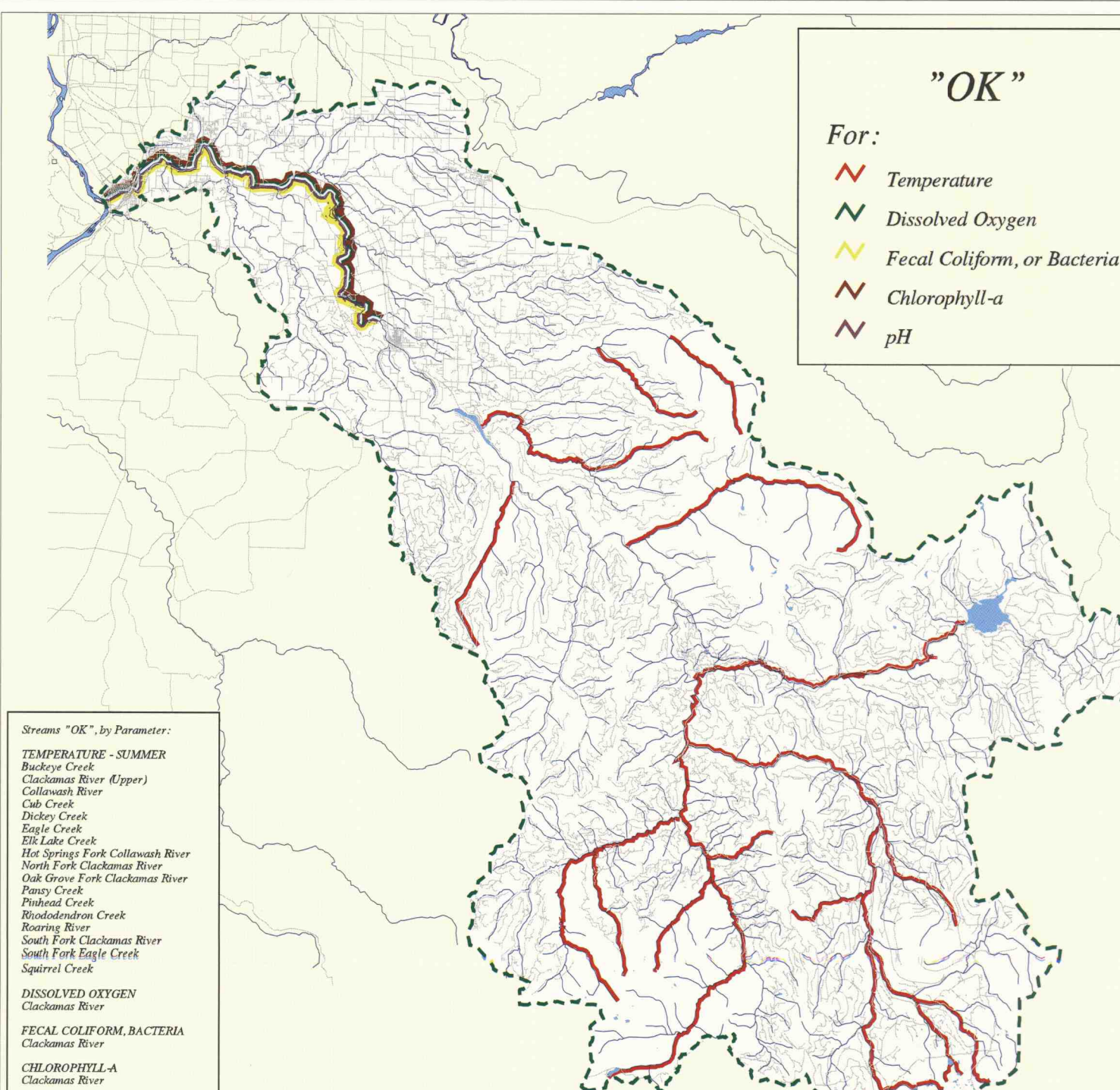


Streams Of Potential Concern,
by Parameter:
TEMPERATURE - SUMMER
Cooper Creek
North Fork Deep Creek
North Fork Eagle Creek
Pan Creek
DISSOLVED OXYGEN
Clear Creek
Pan Creek
HABITAT MODIFICATION
Alice Creek
Collawash River
Cooper Creek
Hot Springs Fk Collawash River
Hugh Creek
Kink Creek
Nahorn Creek
North Fork Eagle Creek
Oak Grove Fork Clackamas River
Pansy Creek
South Fork Clackamas River
Wash Creek
FLOW MODIFICATION
Oak Grove Fork Clackamas River
Round Creek
SEDIMENT
Blitzen Creek
Buckeye Creek
Bull Creek
Cay Creek
Clackamas River
Collawash River
Cooper Creek
Crater Creek
Dinger Creek
Foster Creek
Gyp Creek
Happy Creek
Jazz Creek
John Creek
Kink Creek
North Fork Deep Creek
Opre Creek
Pate Creek
Peat Creek
Richardson Creek
Rust Creek
Shellock Creek
Slide Creek
Stace Creek
Switch Creek
FECAL COLIFORM, BACTERIA
Bull Creek
Pine/Nation Creek
NUTRIENTS
Foster Creek
Richardson Creek

"OK"

For:

- Temperature
- Dissolved Oxygen
- Fecal Coliform, or Bacteria
- Chlorophyll-a
- pH



Streams "OK", by Parameter:
TEMPERATURE - SUMMER
Buckeye Creek
Clackamas River (Upper)
Collawash River
Cub Creek
Dickey Creek
Eagle Creek
Elk Lake Creek
Hot Springs Fork Collawash River
North Fork Clackamas River
Oak Grove Fork Clackamas River
Pansy Creek
Pinehead Creek
Rhododendron Creek
Roaring River
South Fork Clackamas River
South Fork Eagle Creek
Squirrel Creek
DISSOLVED OXYGEN
Clackamas River
FECAL COLIFORM, BACTERIA
Clackamas River
CHLOROPHYLL-A
Clackamas River
pH
Clackamas River

