

Teacher Background

Finding Your Way Around Puget Sound



This lesson will familiarize your students with the basic geography of Puget Sound: its important salt water features, its rivers, its cities, etc. It will also provide a context for the story which weaves through the curriculum.

In this lesson your students will work through a study guide on Puget Sound geography, finding features on conventional maps and placing information on individual student maps of Puget Sound. These student maps are printed on four separate pages of the student section. When you duplicate these for your students, you may want to use a heavier paper. Your students will need to tape these pages together from the back side. They can keep this map folded when not in use. Since future lessons will make occasional use of this map, suggest that the map be cared for in a safe place.

Since your students will need to share reference materials, you will probably want to arrange them in 5-6 groups to do the work. Allow as much room as possible for spreading out reference maps. Large tables or the floor work great.

Before beginning, emphasize to your students that they will be putting a lot of information on this map, so they will need to work neatly and write small. You will probably want to have extra blank maps on hand at the beginning, for students who decide to start over.

Lesson Plan



Finding Your Way Around Puget Sound

Student Objectives:

Students will be able to locate important geographic features of Puget Sound on a map: cities, land masses, water bodies, and rivers.

Materials:

- One copy per student, blank student map sets
- One copy per student, FINDING YOUR WAY AROUND PUGET SOUND
- 5 Washington State road maps
- 5 Puget Sound road maps
- 5 topography maps
- 10 red felt pens
- 5 Dictionaries
- Pencils
- Colored pencils
- Graphics:
 - GROUNDWATER CONTAMINATION
 - LEAD CONTAMINATION
 - CONTAMINATED SHELLFISH SITES
 - ESTIMATED LAND USE IN THE PUGET SOUND PLANNING AREA

Procedure:

1. Explain to your students the purpose of this activity -- to help them become familiar with the geography of the Puget Sound region, and to make maps which they will be using later. Ask the students to take special care in developing their maps since they will be used for activities throughout the project.
2. When the students are finished with the study guides, discuss these topics with them.
 - Ask them to generalize where most of the centers of population are located around Puget Sound.

LESSON PLAN

- Why do they think so many major population centers are concentrated along the shoreline or along rivers?

(Urban centers are often located where two or more means of transportation intersect, ships and rail for example. Formerly the rivers themselves were used for transportation. Although this is less the case today, ships still need protected harbors, and rivers often form suitable ports. Industry and the population centers they support require abundant fresh water.)

- From their imaginations or prior knowledge, what impacts has urban development probably had on the surrounding land and water?

(Record their ideas about pollution or habitat loss on the board.)

- 3.** After they have had time to respond, you can show them the following transparencies:

- GROUNDWATER CONTAMINATION
- LEAD CONTAMINATION
- CONTAMINATED SHELLFISH SITES

Do not spend a great deal of time discussing the information on these transparencies at this time, but do help them to see that environmental contamination and other impacts tend to be clustered around urban and industrial centers.

- 4.** Finally, show them the chart, ESTIMATED LAND USE IN PUGET SOUND PLANNING AREA. Discuss the changes which have taken place since 1967 and 1984, and the expected changes by the year 2000. Call attention especially to the estimated growth expected in the category "Intense Urban" on this chart. From the standpoint of water quality problems like those raised in step 4, above, why might we be concerned?
- 5.** Have the students keep their finished maps in their Puget Sound folders, and explain that they will need to refer back to these maps later in the unit.

Answer Key:

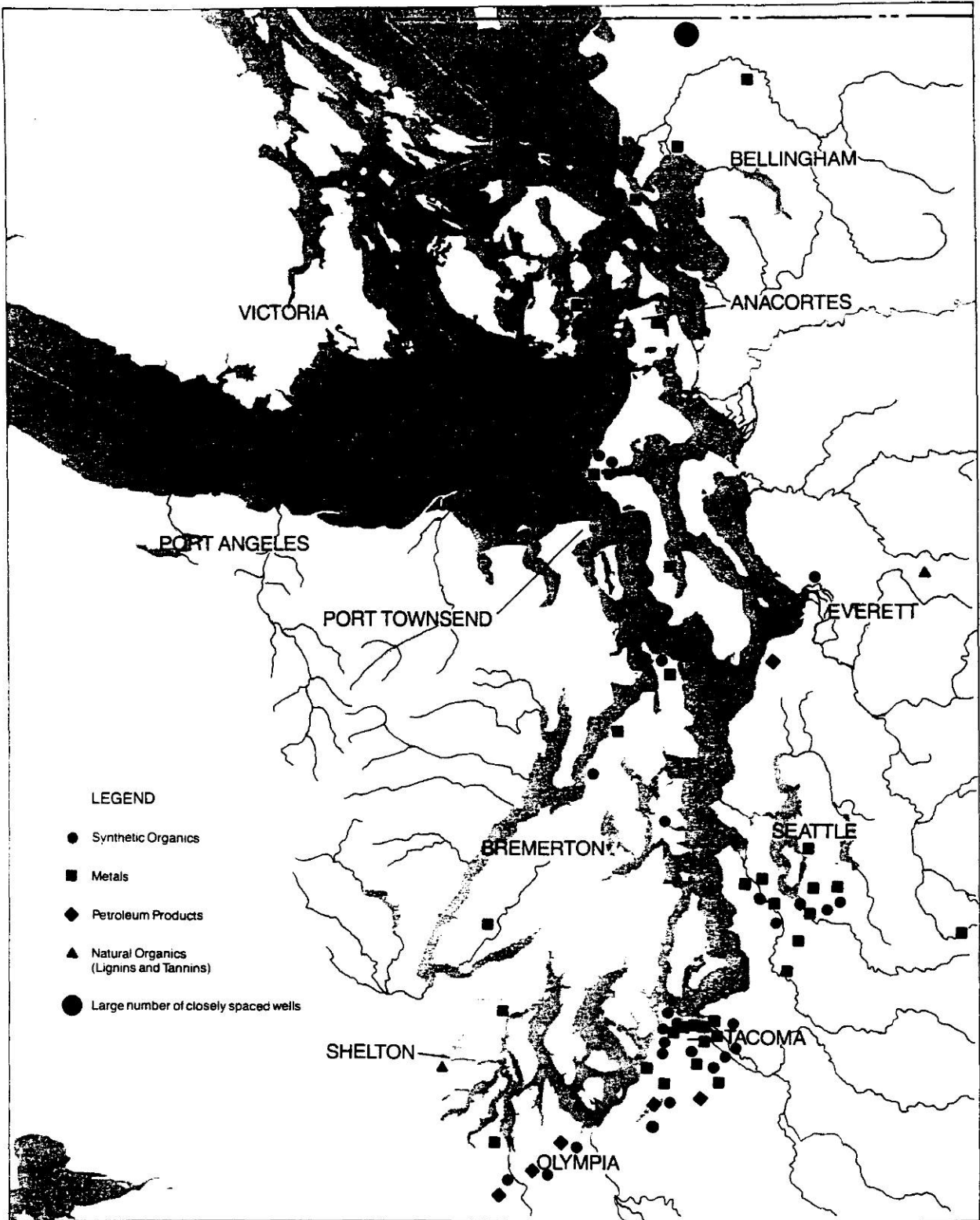
See map for questions regarding location of specific features.

1. A sound is an inlet, arm or recessed portion of the sea.
2. Puget Sound lies between the Cascades and the Olympics.
3. **a.** A strait is a narrow passage of water connecting two large bodies of water.
b. Puget Sound is connected to the Pacific Ocean by the Strait of Juan de Fuca.
4. **a.** A peninsula is a piece of land almost surrounded by water.
b. The peninsula west of Puget Sound is the Olympic Peninsula.
7. **b.** The Fraser River empties into the Strait of Georgia.
c. The Hoko, the Elwha and the Dungeness empty into the Strait of Juan de Fuca.

9. a. An estuary is the part of a river where its currents meet the sea's tides and is subject to their effects.
- c. Puget Sound could be thought of as the place where all the rivers draining into it mix their fresh water with the sea. Nearly all of Puget Sound shows some effects of both sea water and fresh water.

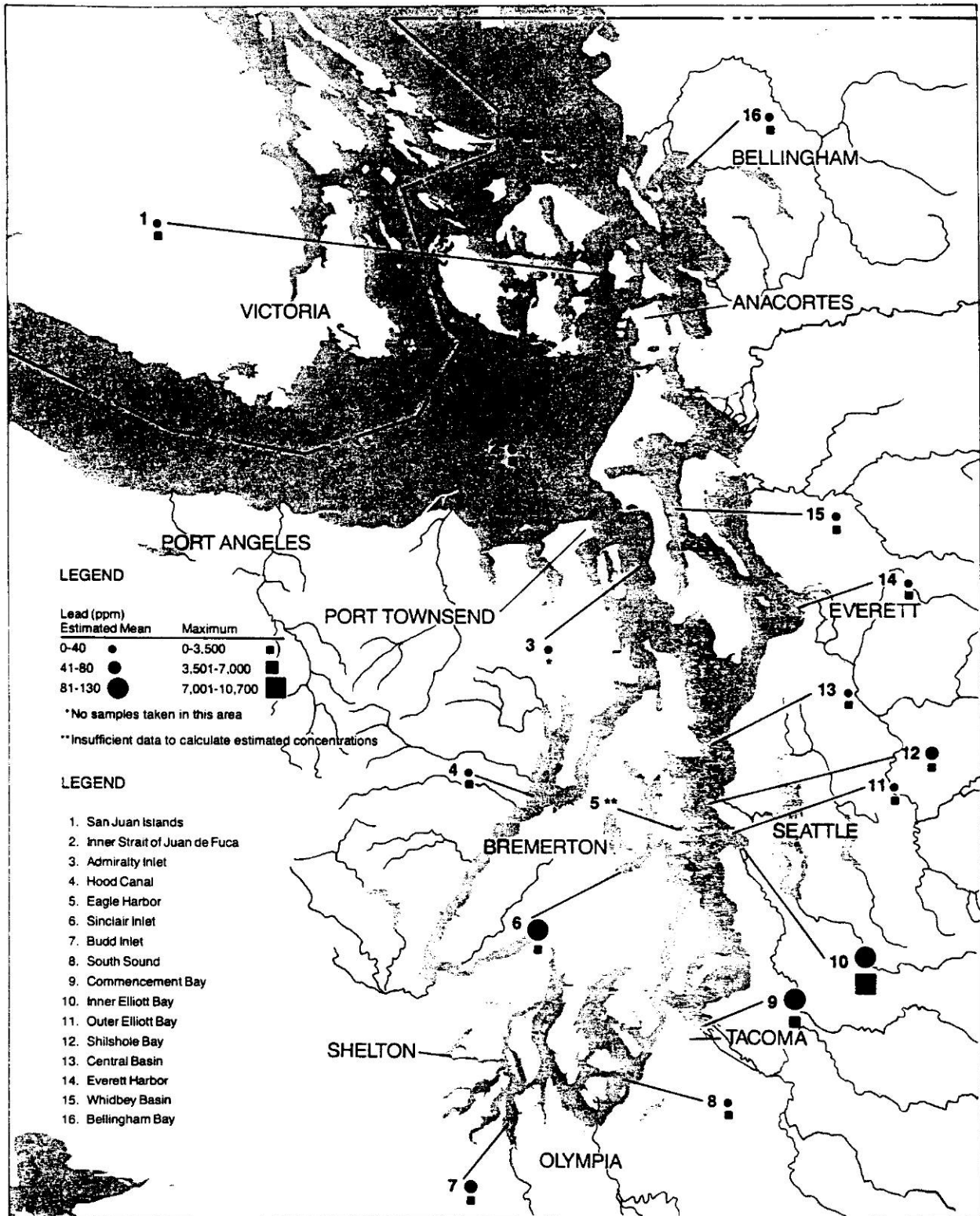
10. a.

Vancouver x.....x
 Victoria x
 Bellingham..... x
 Burlingtonx
 Friday Harbor x
 Anacortes..... x
 Port Angeles..... x
 Port Townsend x
 Oak Harbor x
 Everett x.....x
 Poulsbo x
 Edmonds x
 Seattle x.....x
 Bellevue
 Renton.....x
 Tacoma x.....x
 Bremerton..... x
 Olympia x.....x
 Shelton x



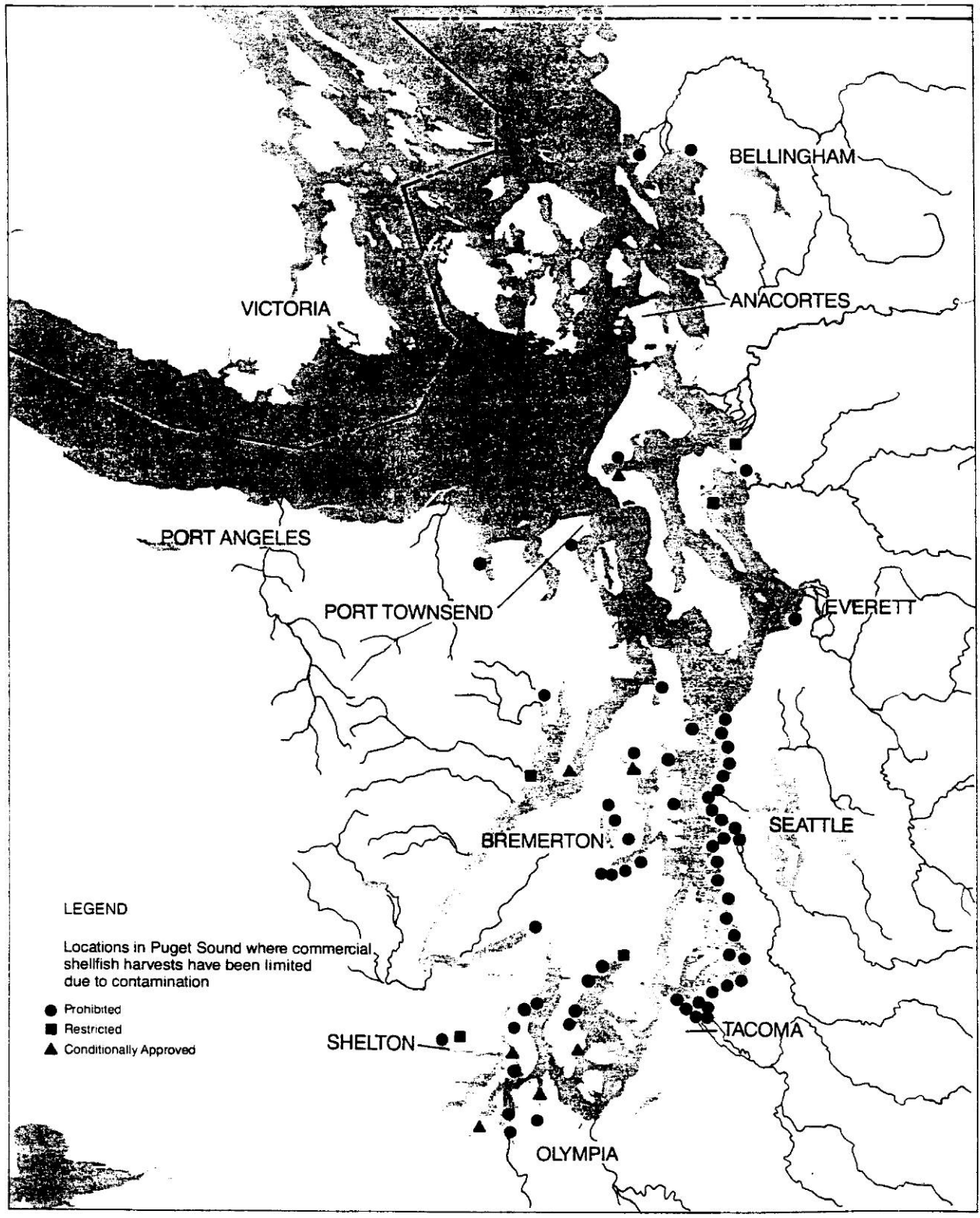
Reference: Ecology, 1987a

KNOWN GROUNDWATER CONTAMINATION SITES IN PUGET SOUND



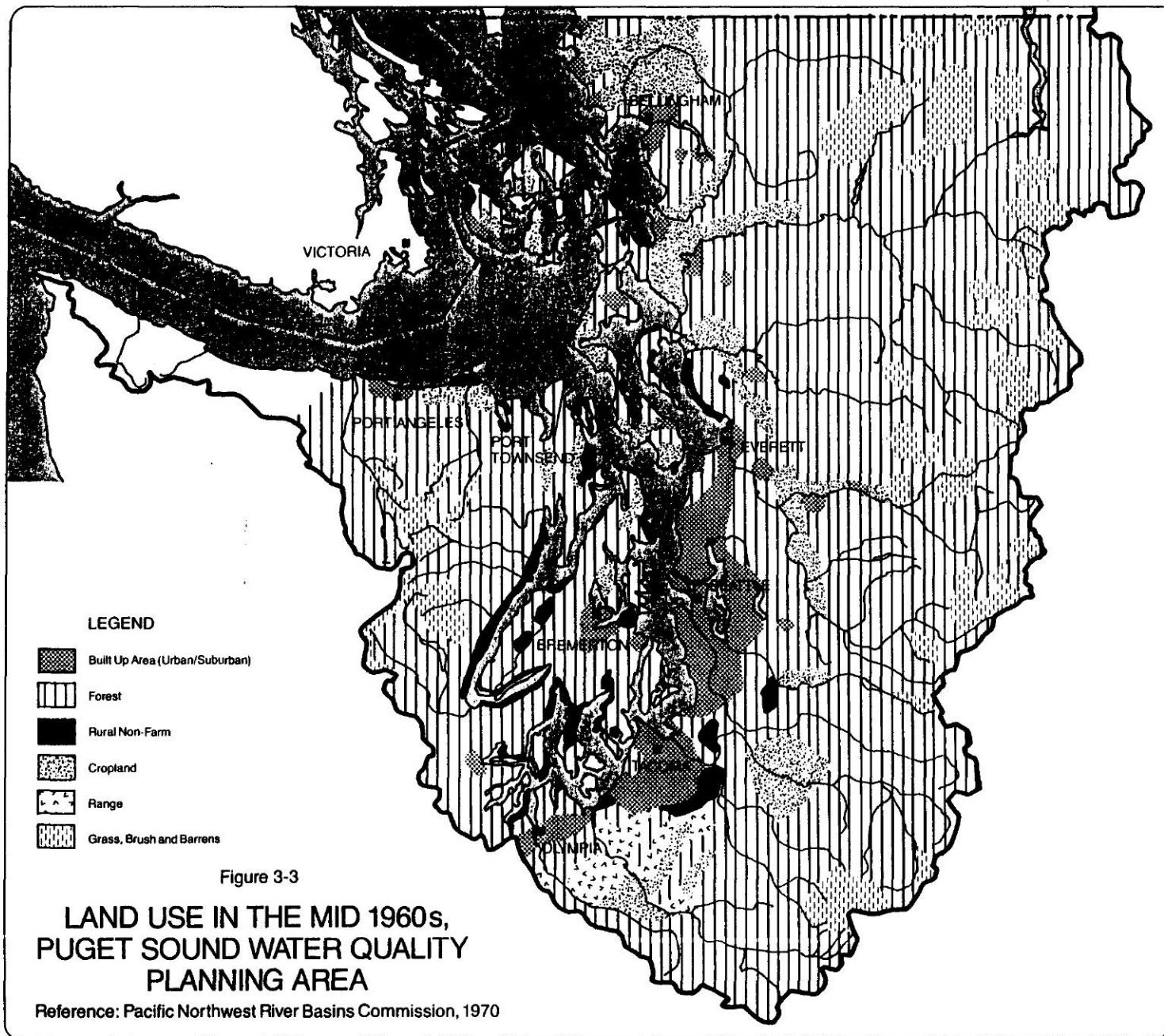
Reference: Puget Sound Environmental Atlas (Evans-Hamilton, Inc., 1987)

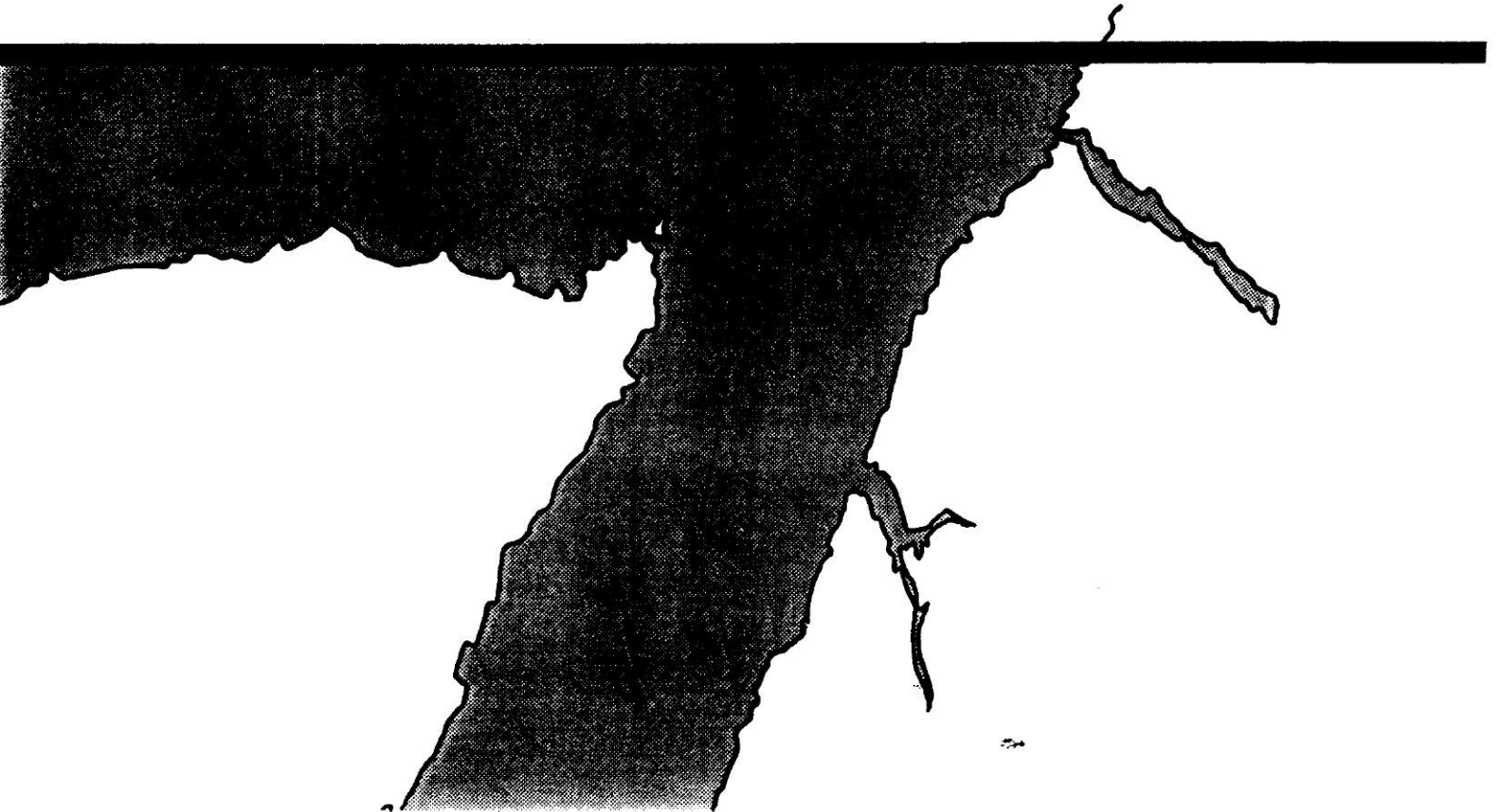
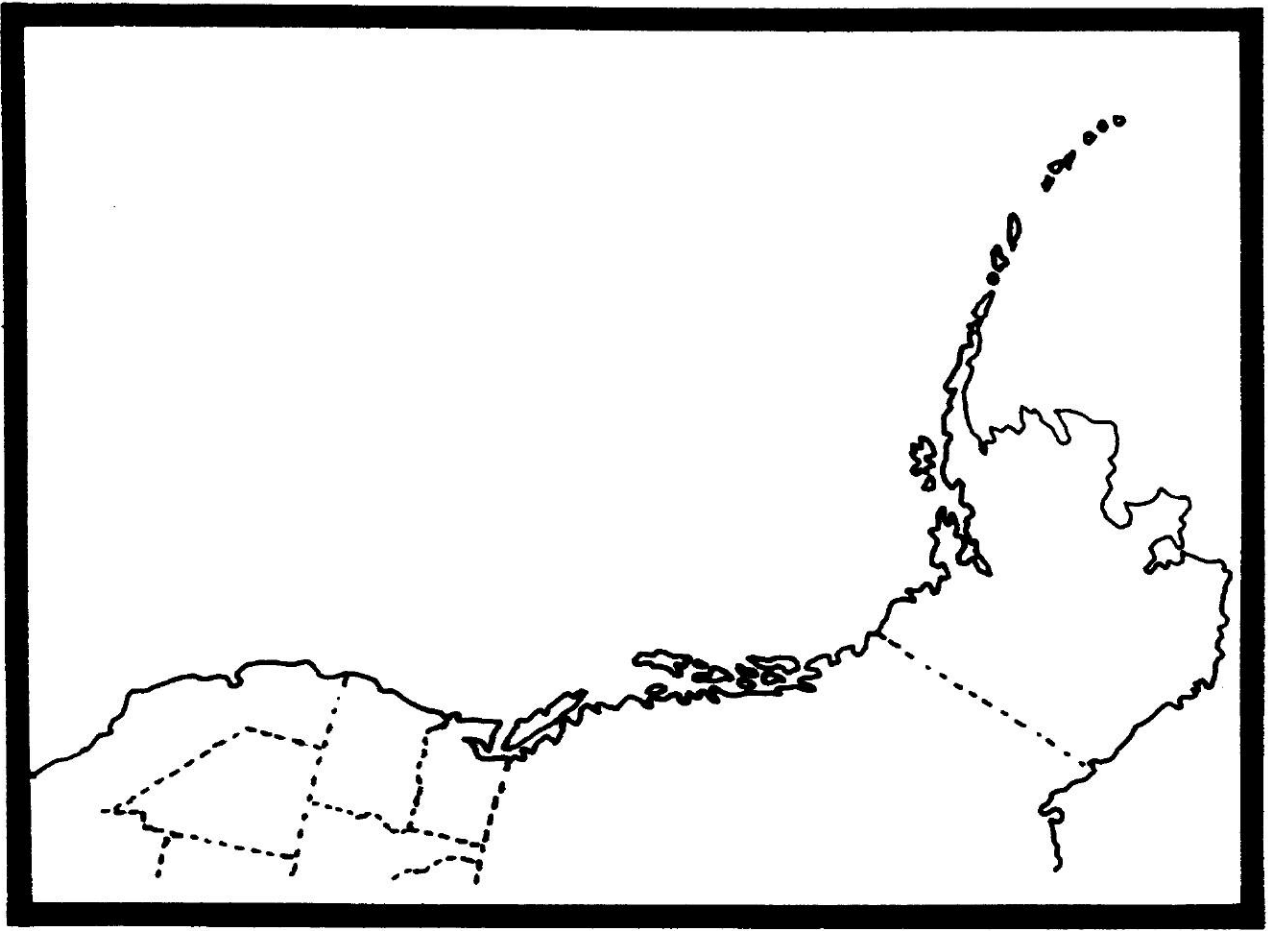
DISTRIBUTION OF LEAD IN PUGET SOUND SEDIMENTS

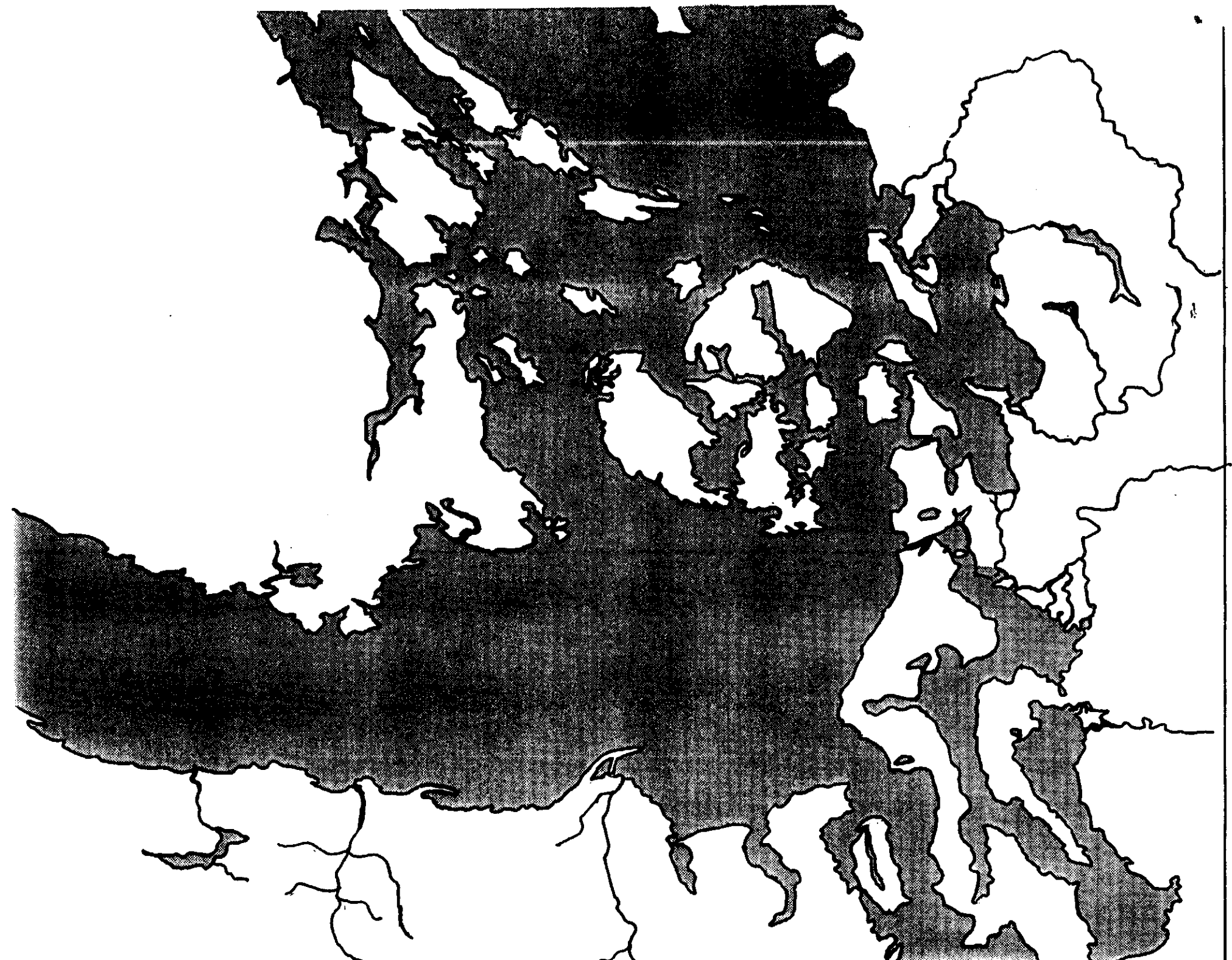


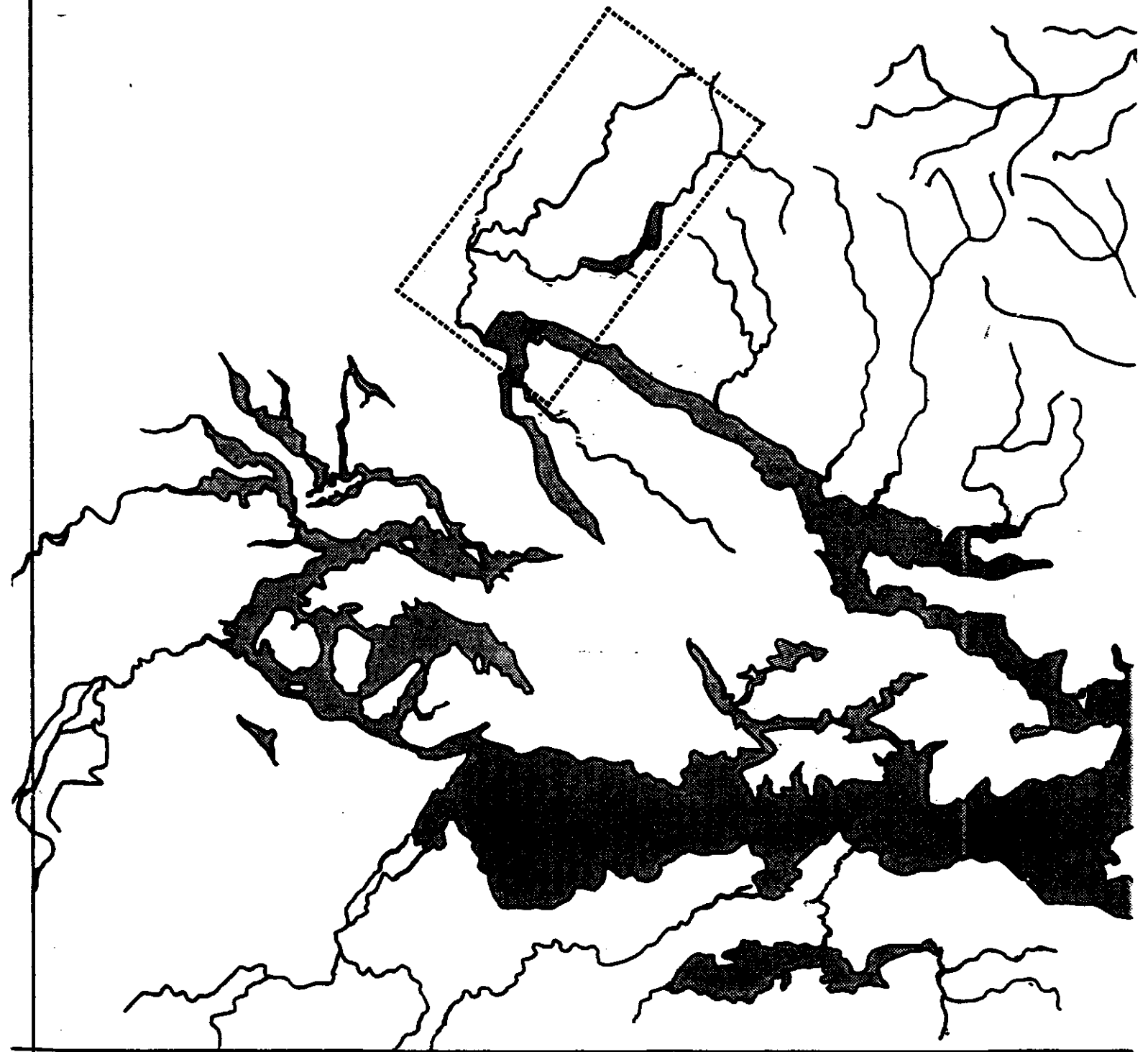
Reference: DSHS, 1988

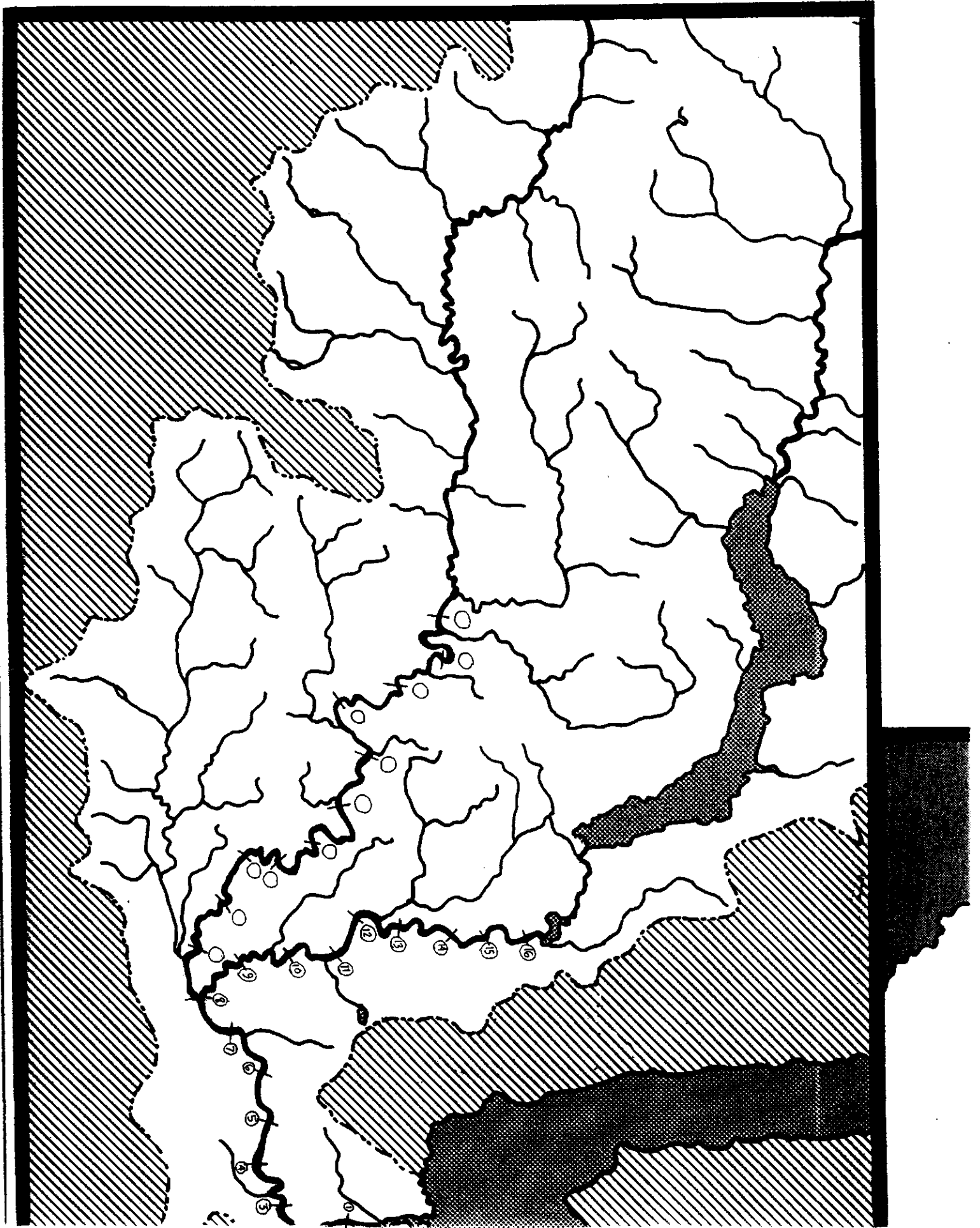
**CONTAMINATED SHELLFISH BEDS
IN PUGET SOUND, 1987**













Finding Your Way Around Puget Sound

If you have lived in Puget Sound very long, chances are you have been in many parts of it. But how well do you know your way around? This exercise will help you become familiar with our Puget Sound landscape.

You'll need to use the dictionary and reference maps to answer the following questions and to label these features on your Puget Sound map. Use a sharp pencil or fine-tipped pen for map labels. Write small! You'll be putting a lot of information in a small space.

- 1.** What is the dictionary definition of a "sound"? (-- as in Puget Sound, not something you hear!)

- 2.**
 - a.** Puget Sound lies in the lowland between what two mountain ranges?

 - b.** Locate and label these ranges on your map.

- 3.**
 - a.** What is the dictionary definition of a strait?

 - b.** What strait connects Puget Sound to the Pacific Ocean to the west?

 - c.** Label this strait on your map.

4. a. What is the dictionary definition of a peninsula?

b. Puget Sound is separated from the Pacific Ocean by a large peninsula. What is the name of this peninsula?

c. Label this peninsula on your map.

5. Locate and neatly label the following bays, inlets and passages on your Puget Sound map:

- Discovery Bay
- Dabob Bay
- Hood Canal
- Padilla Bay
- Skagit Bay
- Elliott Bay
- Commencement Bay
- Admiralty Inlet
- Carr Inlet
- Saratoga Passage
- Colvos Passage

6. Locate and label the following islands on your map:

- Vancouver
- San Juan
- Lopez
- Orcas
- Fidalgo
- Lummi
- Whidbey
- Camano
- Protection
- Bainbridge
- Mercer
- Vashon

7. a. There are many rivers in the Puget Sound lowland. Locate and label these rivers on your map:

- Fraser
- Skagit
- Dosewallips
- Stillaquamish
- Quilcene
- Snohomish
- Dungeness
- Green
- Elwha
- Duwamish
- Hoko
- Puyallup
- Nisqually
- Skokomish
- Hamma Hamma
- Duckabush

b. Which river empties into the Strait of Georgia instead of Puget Sound?

c. What three rivers empty into the Strait of Juan de Fuca instead of Puget Sound?

8. Locate and label the following freshwater lakes on your map:

• Lake Crescent

• Lake Sammamish

• Lake Washington

• Lake Cushman

9. a. What is the dictionary definition of an estuary?

b. Each of the rivers entering the Sound creates an estuary at its mouth. Use a light blue colored pencil to lightly shade the places where freshwater is mixing with saltwater.

c. Sometimes, however, all of Puget Sound is referred to as an estuary too. Explain how the entire Sound could fit the definition of an estuary.

10. a. Use a red felt pen to mark the location of each of the following cities on your map. Label each city.

•Vancouver	_____	_____
•Victoria	_____	_____
•Bellingham	_____	_____
•Burlington	_____	_____
•Friday Harbor	_____	_____
•Anacortes	_____	_____
•Port Angeles	_____	_____
•Port Townsend	_____	_____
•Oak Harbor	_____	_____
•Everett	_____	_____
•Poulsbo	_____	_____
•Edmonds	_____	_____
•Seattle	_____	_____
•Bellevue	_____	_____
•Renton	_____	_____
•Tacoma	_____	_____
•Bremerton	_____	_____
•Olympia	_____	_____
•Shelton	_____	_____

(Hint: These cities are arranged in order from north to south.)

b. On the list above, put a check in the first column if the city is located on marine waterfront. Put a check in the second column if it is located on a river. Which cities are checked in both columns?