CRA
Rapid
Assessment Project

An
Early Regional Assessment
of the
Salmon - Land Use
Connection

Coast Range Association

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The power of your team's Rapid Assessment work won't be evident at the scale of one 6th-field watershed or even of the larger 5th-field watershed. Like all of the dots that make up a printed picture, the merits of our individual projects will be most apparent when we step back and view the whole picture. That picture is the overwhelming pattern of evidence seen when viewing the entire Coast Range region. Your team's work is providing the invaluable **dots of evidence** necessary to see the big picture.

Introduction

We thank you and your fellow team members for participating in this important project. The Early Regional Assessment of the Salmon-Land Use Connection for the Oregon Coast Range will provide important information about your watershed. Documenting the connection between land use and salmon habitat will help in the reform of land management laws at the state level and lead to better implementation of Endangered Species Act (ESA) salmon protection at the federal level. We recognize that the loss of salmon habitat **is due to both past and current** land use practices. It is our belief that the information generated in this project will help sharpen your understanding of how land use impacts stream habitat.

This project has two purposes: (1) To accomplish an early regional assessment of Coast Range land use issues and to determine their connection to salmon habitat, (2) To empower well-informed watershed advocates with the best available knowledge about their watershed.

Early Regional Assessment

For the early regional assessment we have selected 20% of Coast Range subwatersheds. This represents approximately one million acres in 160 specific subwatersheds. Your team is one of over twenty teams working on this project. The foundation of the project is the work you and your team will be doing--the **rapid assessment** of randomly selected 6th-field watersheds.

Rapid Assessment - Building Local Information

Rapid Assessment is based on a **set of forms** that will walk your team through a process of (1) Identifying potential land use issues (problems), (2) Evaluating benchmarked habitat data where available, (3) Characterizing habitat conditions in **general stream areas** of your basin's subwatersheds, and (4) Connecting land use to habitat conditions.

In February 1999, the second draft version of the Oregon Watershed Enhancement Board (OWEB) Watershed Assessment Manual was finalized, and we saw an opportunity to use its **assessment framework** as the basis for this project. Consequently, we have incorporated the OWEB Manual's logic of **land use issues** and **benchmarked data**. Additionally, we noted that an official set of **6th-field subwatersheds** was listed in the State's plan. As part of the materials for this project, we have provided you with a list of subwatersheds identified in the OWEB draft. We believe that the subwatershed scale is the best foundation for building a **local legacy of knowledge** about watershed conditions and restoration needs.

Rapid Assessment is designed for people like you who live in the watershed. No specialized technical training is required to complete the assessment. Rapid Assessment involves the following:

a. Organizing available information about the watershed,
b. Filling in the Rapid Assessment form set using existing data and/or interviewing professional fish biologists and experts to characterize habitat conditions,
c. Using a list of Issues and Benchmarks as the basis for identifying watershed problems linked to land use practices.

Beyond helping to document the regional Coast Range habitat situation, your work will begin building a vital **platform of information** about your local basin. With this information, you will be able to speak more powerfully about the important issues facing your watershed and the recovery of its native salmon.

We have developed this manual to guide your team through the Rapid Assessment form set. Every effort has been made to design a user-friendly assessment process. We are not asking that your team research new information; all the information for this assessment comes from the following sources:

1. Your knowledge of the local watershed,
2. Data we have provided,
3. Where available, already completed assessments by agencies and watershed councils,
4. Interviews with local experts.

The OWEB Assessment process

The Oregon Watershed Enhancement Board (OWEB) Watershed Assessment Manual (referred to as the OWEB Manual) outlines a comprehensive process of 5th-field watershed assessment. A 5th-field watershed is an area of approximately 25,000 to 100,000 acres. The OWEB assessment involves the gathering of large amounts of technical information. This process will take years and will require watershed councils to spend millions of dollars to complete full assessments of all western Oregon basins.

Grassroots Advocacy

Almost a year and a half ago, we wrote the following message to watershed activists:

"It is critical during the next twenty-four months for local activists and leaders to step forth in order to:

(1) Advocate for local watershed protection;
(2) Advance sound watershed assessments within coastal watershed councils;
(3) Assure that watershed councils address the issues that watershed assessments identify."

From hundreds of hours of CRA outreach work, we have identified over 100 grassroots watershed advocates, many of whom are now organized within their own formal and informal local advocacy groups. Many are working to advance watershed assessments within the local watershed council.

Unfortunately, and as many had predicted, watershed councils are compromised by the participation of those concerned first and foremost with protecting their own personal interests. Councils often proceed timidly in their assessment work and have been known to avoid difficult issues. Despite these problems, councils have initiated a large amount of strong assessment work. However, the information is often difficult to access and can be technical in nature. Contractor assessment work for councils is often based on computer Geographic Information System (GIS) analysis and is therefore inaccessible to local residents. As a watershed strategy, the OWEB Manual directs assessment information toward the identification of restoration projects. While there are many practical restoration projects of merit, the overwhelming need is for immediate refugia protection and the re-establishment of natural watershed processes. This will only occur,

as the recently released Independent Multidisciplinary Science Team (IMST) Report concludes, through **landscape-level** state and federal insistence on the reform of land management practices.

If the state and federal governments finally insist on fundamental changes to forestry and agricultural practices, **it will be because people like you made the case for their necessity, and worked to change public opinion.** That is why the Board and staff of the Coast Range Association believe watershed residents should possess local survey data, maps, tools, and reference materials necessary to understand the local watersheds. From this information you can draw your own conclusions and speak out in favor of land management reform. The Rapid Assessment Manual and the accompanying data and maps are meant to empower local activists like yourself for the purpose of protecting and restoring your watershed.

A Note on Drawing Conclusions

This may be a good time to remind everyone involved in the Rapid Assessment Project that watershed processes and salmon population dynamics are very complex. We should therefore assume the same attitude as a good scientist when it comes to declaring what may be known about salmon, habitat and land use: at the scale of your local basin, nothing is ever proven. The trick is to be clear and forceful about what you know and don't know and advocate for change based on what is likely, not on what is proven or disproven.

When it comes to natural systems, where there are so many different variables in play: climate, substrate, nutrient cycles, and on and on. It is nearly impossible to prove "**the"** cause of any problem--the decline of salmon, for example. What we do know is that Coast Range watersheds were once teeming with salmon, and that today one essential feature of the Coast Range landscape is consistently and dramatically different: **the big-tree conifer forest has been reduced to a mere fraction of its once mighty expanse.**

The real power of all this work won't be evident at the scale of a 6th-field watershed or even a 5th-field watershed. Like all of the dots that make up a printed picture, the merits of our individual projects will be most apparent when we step back after our work is done and view the whole picture. That picture is the overwhelming pattern of evidence seen when viewing the entire Coast Range Bioregion. Your team's work is providing the invaluable **dots of evidence** necessary to see the big picture.

Section 1

Getting Started

The rapid assessment is based on available data, and where data are lacking, reliance on the informed opinions of local professional biologists. While both the **OWEB Manual** and federal **Watershed Analysis** take place at the larger 5th-field scale, we noticed that their discussion of issues and assessment of conditions were usually done at the smaller subwatershed scale. This might be a good time for you to look at the definitions of watersheds in Table 1 below.

Table 1. Watershed Description and Terminology

Watershed Level	USGS[1] HUC[2] Code	Term	Example
1st field	17	Region	Pacific Northwest
2nd field	09	Subregion	
3rd field	00	River Basin	Mid-Coast
4th field	01	Subbasin	Alsea
5th-field		Watershed	Lobster/Five Rivers
6th-field[3]		**Subwatershed**	**Camp Creek**
7th field		Drainage	West Fork Tributary
8th field		Site	West Fork Pond

A note on terminology:

[1] USGS = United States Geological Survey

[2] HUC = *Hydrological Unit Code*, a number which is a unique identifier of watersheds down to the subwatershed level. For example the Alsea Subbasin HUC is 17090001.

[3] *6th-field watershed* and *subwatershed* are interchangeable terms.

Watersheds come in all sizes, and sometimes the terms listed in Table 1 are used interchangeably. The above scheme described in Table 1 was developed by the US Geologic Survey. The watershed levels listed above are **nested** - smaller ones are contained within larger ones.

Recently, a set of boundaries for small 6th-field Coast Range watersheds has been drawn. This will enable your team to organize data around an official set of subwatersheds, and begin building the case for their protection and restoration. As you and your team learn more about your local watersheds you will be able to play an ever stronger role in advocating for land use reform and habitat protection.

Beginning the rapid assessment process involves the following five steps:

Step 1. Get Together With Your Team & Review the CRA Provided Materials:

a) Review the list of randomly-selected 6th-field watersheds to assess. In a 3-ring binder titled **Master Manual**, we have provided a reference map of your local 6th-field watersheds and a list of randomly-selected 6th-field watersheds that your team will assess first. The selected subwatersheds are highlighted in blue. To provide some context to how watersheds are nested, you will also see a map of 5th-field watersheds (outlined in pink). Initially, your team will have from one to seven subwatersheds to assess for this project.

b) Review ODF Stream Classification Maps. We have provided a set of Oregon Department of Forestry (ODF) Stream Classification maps for your assessment area. These maps were developed from USGS maps and depict an enhanced stream network. The stream classification maps show the state's official classification of "large," "medium," and "small" streams and the upstream limit of fish use. You will use these maps to create a **base map** of each 6th-field watershed in your basin. These maps are updated frequently, and the ones provided by the Coast Range Association may not be the latest versions. However, for the Rapid Assessment project the maps are used only for their topographic features.

c) Review Stream Surveys for your area. We are providing printed sets of ODFW and Siuslaw National Forest stream survey data for your basin. Much of this data will be for subwatersheds not selected for the 6th-field Rapid Assessment Project. However, we believe as you and your team become more familiar with assessment work you will want to build an information base for all of your subwatersheds.

Each surveyed stream reach results in a specific **record** of information and a **location map**. Review the survey data documentation that we have provided, which explains what each information field means. Each habitat element in the survey has a number. We have applied a benchmark value to all the survey data (i.e. "Desirable," "At Risk" and "Undesirable"). The benchmarks are from the OWEB manual. Review the benchmark evaluations for survey data in your basin. Is the large wood condition generally good or bad? Do the streams in your watershed appear to have sufficient pools?

d) If available, review federal Watershed Analyses, ODFW Basin Management Plans, and completed watershed council assessment work. While these documents often appear bulky, the actual number of pages with the information you need is quite small. Don't be intimidated by appearances--we will work with you to find the information you need.

e.) Review the Department of Environmental Quality's *Decision Matrix* for information about water quality in your basin.

Step 2. Create a Base Map for Each 6th-field Watershed

Materials needed:

- ODF Stream Classification Map of the basin
- Reference map of 6th-field watersheds
- Razor knife
- Glue stick
- Base map identification form
- 11”x17” base sheets

Your first task is to create a base map of the 6th-field watersheds. We have provided an assembled ODF stream map for your entire watershed. Refer to the 6th-field watershed map to find the 6th-field boundaries. Carefully transfer the 6th-field boundaries onto the ODF stream map using a pencil. You will make mistakes and occasionally have to erase. When you are sure the boundaries are accurate, go over the pencil lines with a yellow highlighter. After you have finished transferring all the 6th-field boundaries, carefully cut the 6th-field watersheds out of the map. Depending on the size of the 6th-field use one or more 11x17” blank sheets for the base sheet of paper. Glue each 6th-field to one base sheet of paper. We recommend making the base sheet size as small as possible. Finally, fill in the 6th-field identification form and glue it to the upper left hand corner of the base sheet. Glue a North-South indicator to the upper right hand corner. Congratulations, you have a completed **a 6th-field Base Map**.

Step 3. Fill in Form 1 - General 6th-field Watershed Information

First, see Table 2, a list of ODFW basin names on page 8; you should easily recognize the commonly known basin where the subwatershed is located. The Master Manual contains a list of 6th-field watersheds for your area. That list contains a unique code number for each 6th-field. Although each 6th-field is assigned an unique number, your group will want to come up with a convenient name for each 6th-field. This name should probably be based on a major stream or other unique feature present in that subwatershed. You have probably noticed that the ODFW basin names in Table 2 do not correspond to the federal USGS basin names in Appendix 1.

Ecoregions

We will also tell you which ecoregion your subwatershed falls in, as well as the elevation and precipitation information.

Team Member Names

Please be sure to fill in the names of all the participants in your group. If there are more names than spaces, just continue at the bottom or on the back. Choose a team member as your contact person.

Advice for filling out forms:

As you begin the process of completing in the Rapid Assessment forms, don't worry about filling in every last blank; just fill in what you can and move on. More than likely the answer will become clearer later on, and many of the questions can only be answered during the interview with a professional biologist. Also feel free to make your own notes outside of the spaces provided. If you write on the back of a form be sure to indicate what information category it refers to on the front of the form. If at any point in the assessment process your team is confused or it is unclear what information goes where, call the Coast Range Association office and ask for help (541-758-0255). The more subwatersheds you assess the easier the process becomes.

Table 2. ODFW Basin Names

The Oregon Department of Fish & Wildlife has its own set of basin names that they use to organize their data. This is different than the naming system used in Table 1. Use one of the following to identify your 6th-field location:

Alsea River	Nestucca River
Beaver Creek	Ocean
Big/Lower Columbia	Salmon River
Clatskanie/Lower Columbia	Scappoose/Lower Columbia
Coast Fork Willamette	Schooner Creek
Coos River	Siletz River
Coquille River	Siuslaw
Depoe Bay	South Fork Coos
Devils Lake	South Fork Coquille
East Fork of Coquille	South Fork Wilson
Elk (Ecola Creek)	South Fork Willamette
Kilchis	South Yamhill
Lewis & Clark/Lower Columbia	Tenmile Lakes
Long Tom	Tillamook River
Lower Columbia	Trask River
Luckiamute	Umpqua River
Main Umpqua	Willamette River
Marys	Wilson River
Miami	Yachats River
Middle Fork Coquille	Yamhill River
Millicoma	Yaquina River
Necanicum River	Youngs/Lower Columbia River
Nehalem River	

Step 4. Create a Land Use Overlay for the Base Map

The next task is to identify the 6th field's basic land uses. The OWEB assessment process assigns watershed land uses to one of four categories: (1) Forestry, (2) Agriculture, (3) Range Land, and (4) Urban. Review the definitions of the above land uses in the OWEB manual. For this project we are adding a fifth category useful to the Coast Range - (5) Rural Settlement.

Rural Settlement Defined

Rural settlements are typified by groups of single-family dwellings and outbuildings on lower and mid-watershed valleys, not associated with large crop fields or pastures. Many such settlement areas are found along all Coast Range rivers. Although at first it may appear that agriculture or range use exists in these areas, rural settlement areas are distinguishable from agriculture and range areas by their higher density of dwellings (more than one dwelling per five acres). In rural settlement, crops or livestock may be present but the field and pasture size generally do not exceed the two to four acre size. Zoning is not the sole basis to identify land use; instead, use the actual settlement pattern as the basis for distinguishing rural settlement from agriculture and range areas.

Since forestry is the overwhelmingly dominant land use in the Coast Range, we ask only that you attempt to map the non-forestry land use areas of agriculture, range, urban and rural settlement. We have provided clear acetate sheets and a **tab and pin system** to affix the acetate to the base map. Pin a sheet of clear acetate over the base map. This overlay is now referred to as the **Land Use Overlay**.

Determining Non-Forestry Land Use

Mapping general grazing, agriculture and rural settlement areas will require a field visit. Since these areas are almost always accessible by road, this is an in-car mapping exercise done while driving the several miles of road in any 6th-field watershed. So far, in several test mappings, we have found the time required for each 6th field is about 30 minutes to an hour. Assume 6th fields closed to public traffic are entirely made up of forest land unless known otherwise. Schedule a land use mapping training session with a Coast Range Association staff person for your first mapping effort. Land use mapping is easy, fun, and very important for understanding the issues of the watershed.

When drawing the land use areas on the acetate overlay use the following colors:

green = agriculture use
orange = rural settlement
brown = range use
red = urban use

Determining Land Use Area

Next, determine as best you can the number of acres in each non forestry land use category by using the provided grid (64 squares per square inch) mylar sheet. Place the grid over your Land Use Overlay. Count the squares that fall within each land use area, combining partial squares. Multiply the number of squares within each land use area by 1.43 acres. The provided

Land Use Worksheet will help you tabulate the acreage for each land use. Total the acreage for grazing, agriculture and rural settlement and subtract it from the total acres in the 6th-field (a number we will provide) and you have the number of acres devoted to forestry land use.

Congratulations! You have mapped land use areas and determined the land use acreage.

Step 5. Fill in Form 2, *Land Use & Potential Land Use Issue Identification.*

The next step is to complete Form 2 and identify potential land-use issues. Listing potential watershed issues will guide your team in making the connection between land use and habitat loss for salmon.

Form 2, #1: Land Use

Consulting your Land Use Overlay and acreage totals, rank land uses in order by acreage from largest to smallest. Forestry will almost always be the largest land use category.

OWEB identifies three land uses that may apply to your watershed and should be identified in Form 2 if present; (a) Mining, (b) Dams and Irrigation Networks, and (c) Road Networks. Obviously, this being the Coast Range, the road land use category will certainly apply to almost all 6th-field watersheds. We are not asking teams to map or assess mining, dams or roads. Do not try to determine acreage for these land uses.

Form 2, #2: Issue identification

The word ***issue*** refers to something that locates a potential problem for fish habitat. For example, pool quality and quantity within streams play very important roles as salmon rearing habitat. The loss of pool quality or quantity is a major issue for salmon survival.

a. Listed Fish Species

If you know the currently listed, proposed or petitioned species, fill in the form. Otherwise this can wait. Consult your ODFW biologist to find out the current federal Endangered Species Act (ESA) status of salmon species in your watershed.

b. Water Quality

Water quality limited streams, as determined under the authority of the federal Clean Water Act, are listed on the Department of Environmental Quality's **(DEQ) 303(d) list**. Potential water quality issues are called ***parameters*** in the 303(d) assessment process. We are using the words *parameters* and *issues* interchangeably. DEQ reviews water quality problem brought to their attention in a document called the **Decision Matrix**. We have provided your team with the 1998 Decision Matrix for your team area. Review the Decision Matrix for your watershed. The Decision Matrix includes both 303(d) listed streams plus streams and water bodies that were **considered** for listing but were not judged to be in bad enough condition to be listed at the time. Stream segments in your watershed may be considered for several water quality problems

(parameters) in the 303(d) Decision Matrix. High temperature is the most common problem, but there may be others, for example: habitat modification, coliform bacteria, chemical contaminants, etc.

To read the Decision Matrix, first familiarize yourself with all the named creeks in the sub-watershed as well as the larger creek or river they drain into. Under "Name and Description" the Decision Matrix lists stream segments, for example, in the Wilson/Trask/Nestucca subbasin:

Jordan Creek - Mouth to headwaters

In this case, the described parameters (habitat modification, sedimentation) are of concern for all of Jordan Creek. Fill in 2-b with all parameters mentioned in the Decision Matrix for the stream segment that captures your 6th-field area.

Form 2 - Additional Suspected Water Quality Parameters (Issues) not mentioned in the Decision Matrix

Due to the enormity of the task, as well as political considerations, not all potential issues have been assessed by DEQ. We recommend you automatically check habitat loss since nearly all Coast Range streams have undergone some kind of severe habitat alteration. Habitat loss is a parameter/issue to mention in your interview with an agency biologist. See if they agree.

Form 2, # 3: Land Use and Suspected Issues (See Table 3)

Each of the land uses identified in your **Land Use Overlay** are associated with a set of well known issues related to endangered salmon and water quality. **Table 3** provides a list of those issues to guide you in filling in this section of Form 2. Filling in **Potential** land use issues is simple - conditions are so bad for most Coast Range streams that we recommend writing in **all the issues** listed in Table 3 associated with each identified land use.

Congratulations, you have completed Form 2! We hope you are getting a sense of how manageable the process of Rapid Assessment is.

Having determined land use and the potential issues associated with each land use gives your team the foundation needed to now look at habitat conditions and water quality, and to confirm that in fact problems exist. The base map, human land uses and suspected issues, taken together, orients the team as you move into the substance of Rapid Assessment--looking at the actual fish populations and habitat. The Base Map provides the topographic features of terrain critical to habitat formation. Determining the human land uses provides a powerful basis for identifying suspected habitat problems. And listing the potential water quality and land use issues focuses the team's attention toward the most likely problems that exist in the watershed.

Table 3.

Habitat Issues and Land Use

Land Use Category	Habitat-Related Issues	Water Quality Issues
1. Forestry	Channel modification Poor pool quantity & quality Shade & canopy loss Lack of large wood abundance Substrate quality Flow alteration	Habitat Loss High temperature Turbidity Excess fine sediments Herbicides Course Sediments
2. Rural Settlement	Channel modification Large wood abundance Shade and canopy loss Pool Quality & Quantity	Habitat loss Temperature Sedimentation Herbicides Septic Contaminants
3. Cropland-grazing (Agriculture)	Channel modification Pool quantity and quality Large wood abundance Shade and canopy Substrate quality Stream Bank Erosion	Temperature Dissolved oxygen Turbidity Fine sediments Suspended sediments Habitat loss Nutrients Bacteria
4. Urban areas	Flow alteration Channel modification Pool quantity and quality Shade and canopy	Temperature Nutrients Turbidity Suspended sediments Fine sediments
5. Mining	Channel modification Pool quantity and quality Substrate quality	Turbidity Suspended sediments Fine sediments

Land Use Category	Habitat-Related Issues	Water Quality Issues
6. Dams and irrigation works		
	Flow alteration	Temperature
	Channel modification	Dissolved oxygen
	Substrate quality	Turbidity
	Pool quantity and quality	Fine sediments
7. Road networks		
	Flow alteration	Turbidity
	Channel modification	Suspended Sediments
	Pool quantity and quality	Fine sediments
	Substrate quality	Temperature
	Canopy & shade loss	

Section 2:

Step 6. Identifying Response Streams for Potential Spawning and Rearing Habitat

The Rapid Assessment project takes a **watershed perspective**, a perspective that takes into account both the stream and the land-based environment. Rapid Assessment gathers information that will be useful in understanding how the upper watershed influences instream salmon habitat. The Rapid Assessment Project, like the Oregon Plan and the OWEB manual, is driven by the issues linked to the protection and recovery of native salmon. While the natural historic condition of the entire watershed--from the estuary to the upper limits of salmon use--was characterized by abundant habitat teeming with various salmon species, that is certainly not the case today.

Many estuary, main stem, and mid-watershed streams have been so severely degraded that they no longer provide properly functioning spawning and rearing habitat for chinook, coho and steelhead. Politically, the need for refugia protection and general land use reform are not identical, so we recommend your team have two goals in mapping critical stream zones:

1. **For refugia protection,** identify those streams that provide the best remaining salmon spawning and rearing habitat.
2. **For the purposes of land management reform**, a different goal is needed. Many of the best watershed areas for salmon production were low-gradient alluvial floodplains in the mid and lower watershed. Land uses that destroyed the best historic production areas, and land uses that threaten the best remaining salmon spawning and rearing habitat should be identified. For the Coast Range, past and current forestry, rural settlement, and agriculture most likely account for the vast majority of habitat loss. It is very important to identify past high production stream areas lost to land abuse and apply the appropriate lessons to current management.

Therefore, we urge your team to create a coarse map overlay that identifies where the most likely spawning and rearing habitat exists or existed--low-gradient unconfined streams do exist.

The OWEB manual describes a stream-typing system which we believe to be very useful. The need to identify stream types is the centerpiece of watershed assessment in both the OWEB manual and the CRA Watershed Manual. We hope you are active in your local council advocating that a thorough stream-typing project be completed for your basin.

Mapping Response Streams

We are asking the team to create a Base Map overlay for a small but important part of the stream system -- those streams of potential spawning and rearing habitat for coho, steelhead, and chinook. Unless there is a blockage for fish passage, potential salmon spawning and rearing habitat most likely occurs in streams that are sufficiently large, unconfined, and of relatively low gradient. **Unconfined** streams are those with enough room (i.e. a wide enough valley) to allow the formation of habitat outside of a narrow channel form. Low gradient (less than 8%),

unconfined streams **respond** to the presence of habitat building materials (sediment, large wood, beaver activity) allowing the development of various habitat features. These responsive stream areas are very important to know, map, and study.

Strategy Statement 5 from the *CRA Watershed Manual* guides this rapid assessment project:

> *Time and resources are limited - build your [assessment] program outwards, from low gradient depositional [response] reaches. Mapping your watershed for source, transport, and depositional reaches allows for the rapid identification of the highest priority areas. Further focus your efforts by identifying those areas that are recoverable or functioning.*

In the CRA watershed manual we label response streams as **depositional** streams and explain their role as a component of the entire stream network. There are three functional stream groups: source (streams that contribute wood and sediment), transport (streams that are too steep and mostly move wood and sediment along), and depositional (streams that flatten out in a valley is broad enough to potentially allow the deposition of wood and sediment to form complex, habitat-rich stream reaches). We suggest reading pages 1-4 in Section V of the CRA Manual for a refresher on this issue. The OWEB Manual uses the term **responsive** instead of depositional and so we are adopting their terminology.

Materials Needed to Map Response Zones

- 6th-field Base Map
- A sheet of clear acetate the size of the base map
- Recommended colored marking pens (fine-point)
- Any fish presence, habitat maps or stream habitat type maps contained in Watershed Analysis, Watershed Council reports, etc.
- Mylar stream gradient scale for use on topographic contour lines.

What to do

1. Pin a sheet of acetate over your 6th-field base map.
2. Trace the fish bearing streams on the acetate sheet from the base map.
3. If you know of channel habitat type maps available for your area (some watershed councils have them), it would be very useful to have a copy.

4. Map any depositional streams (from federal Watershed Analysis).

5. If no federal, state or watershed council maps exist showing response streams **schedule a mapping training with a CRA staff person.** The following portion of this section describes the basics of mapping potential response streams and can be used as guidance after your training session.

Mapping response (or depositional) zones only requires a team to make a **best effort.** We will rely on reading the contour lines of the base map to determine where potential response streams are in the watershed. The fish presence streams identified on the base map are a start, but remember the ODF Stream Classification map (that your base map is from) includes streams that contain *any* fish. Resident trout may be present in streams segments much steeper than those areas useful to chinook, coho and steelhead for spawning and rearing habitat.

Response stream areas are stream sections where the gradient is less than 8%. Start by outlining all streams with less than an 8% gradient with a dashed blue line. Study any available Channel Habitat Type (CHT) stream surveys to see how they lay within contour lines of the USGS maps. This will help you get the feel for reading topo map contours and identifying low-gradient streams. Do your best to eliminate confined streams from the dashed- blue- line-low-gradient layer. If the stream is confined by canyon walls (or alluvium/sediment **(dirt)** banks if entrenched) habitat building materials will move on (transport) during floods.

Using the base map's contour lines to determine stream gradient

Percent gradient (slope) is determined by dividing a stream section's elevation change into its length as seen on a topo map. To measure the distance between contour lines we have provided a **contour scale**. Notice that the contour scale has several different scales on it. Each scale shows the number of contour lines per length of stream for various slope percentages. Place the contour scale over the Base Map and fit the distance between Base Map contour lines crossing streams with one of the scales on the sheet. Draw a solid blue line on the acetate overlay for streams that appear to have a slope of less than 8%.

A Note on USGS Maps: US Geological Survey (USGS) maps at the 7.5-minute or 1:24,000 scale may not always have the same contour intervals. Be sure to check the contour intervals, as the accuracy of your gradient determination is dependent on your ability to know and use this information. Scale and contour intervals are found at the bottom center of the base map and USGS maps.

Table 4. Determining Channel Slope Using USGS Topo Maps

20-foot Contour Intervals

Channel Slope (%)	Distance between contours (ft)	Contours per 1,000 ft of
1	2,000	
2	1,000	1
4	500	2
8	250	4
16	125	8

Channel Slope (%)	Distance between contours (ft)	Contours per 1,000 ft of channel
1	4,000	
2	2,000	
4	1,000	1
8	500	2
16	250	4

40 ft Contour Intervals

Determining Stream Confinement

Confinement Defined: Notice the three OWEB channel confinement classes in Table 5 **unconfined, moderately confined, and confined.** A **moderately** confined stream may sit within a valley bottom as narrow as thirty feet. For example, a 10' wide stream is moderately confined if the floodplain on each side of the bankful width is 10' for a total valley bottom of 30'.

Confinement is a tricky feature to determine. If your team is on its own without other assessments to refer to you will likely only achieve a coarse determination of confinement. This is because topographic maps are not detailed enough for the task at hand. Field checking is necessary for a high level of accuracy and we are not asking your team to do this. Therefore, do the best you can with your topographic maps in determining confinement, rely on local knowledge from your team members, and consult any available field biologist for his or her opinion.

At this point, do your best to spot confined stream areas and erase them from your overlay. When in doubt don't erase. A small moderately confined stream is hard to spot on a topo map. The most likely problem you will encounter is a stream location that appears unconfined because the topo map shows it sitting in an alluvial valley, yet in fact the stream is entrenched into the sediment and flows on the bedrock. Streams with the above condition are often viewable from a road. If possible, spend a day field-checking your draft map, distinguishing entrenched from non- entrenched streams.

Table 5. OWEB Channel Confinement Classes

Map Code	Confinement Class	Floodplain Width
U	Unconfined	>4x bankfull width
M	Moderately confined	>2x but <4x bankfull width
C	Confined	<2x bankfull width

A Note On Entrenchment

Many Coast Range streams are confined not because the land form dictates confinement, but because human impacts have caused the stream to downcut into the alluvial plain and become entrenched. This causes a potential depositional stream area to become a transport reach. While it may not be correct to assume that all Coast Range alluvial valleys were functioning flood plains, the OWEB manual's categorization of all entrenched streams as confined does not aid in a thorough understanding of Coast Range watershed processes.

Mapping Entrenched Streams

Although we are not suggesting mapping response streams lost to entrenchment as part of the Rapid Assessment process, information on this issue is potentially very useful. While widespread stream entrenchment is caused by a complex set of processes, it most certainly has a connection to the loss of large wood in the stream system. The OWEB manual will not lead watershed councils towards an assessment of lost habitat due to entrenchment (also referred to as downcutting). Ambitious Rapid Assessment teams should consider as a future exercise the mapping of entrenched streams.

Section 3:

Water Quality

The term "water quality" includes the actual water in the stream and the physical channel required to sustain life in the stream. The water quality issues identified in Table 3 and the parameters in the 303(d) Decision Matrix (part of your data package) will give you a sense of how water quality problems are often stated. Government efforts to correct water quality problems are generally the result of the federal Clean Water Act. The goal of the federal Clean Water Act is **"to protect and maintain the chemical, physical, and biological integrity of the nation's waters."** This establishes the importance of assessing both water quality and the habitat required for maintaining fish and other water-dependent organisms.

For the rapid assessment we are asking your team to focus on three priority sets of information:

1. Water quality **problems identified in the 303(d) List Decision Matrix** or problems that local professional opinion suggests are present but have not been formally acknowledged on the 303(d) list,
2. The **seven day running maximum temperature**,
3. The **daily maximum temperature** during the warm months.

Water Quality Problems; the 303(d) List

The **Department of Environmental Quality (DEQ)** monitors water quality in Oregon. As noted on page 11, the **303(d) list** catalogs "water quality limited" waterbodies, as determined under the authority of the federal Clean Water Act. DEQ is responsible for compiling this list, and all the information that it examines for making the 303(d) list is found in the 303(d) Decision Matrix. As you can see from looking at the column heading "Supporting Data or Information," the Decision Matrix is based on information provided by many sources, including DEQ's own data sites, US Forest Service, Bureau of Land Management, and even private landowners. The DEQ has not identified **all** water quality problems for streams, whether they are 303(d) listed or not. For example, a quick look at the ODFW stream survey data suggests that habitat loss is a chronic and severe problem in Coast Range streams, yet Habitat Modification is seldom identified as a parameter of concern or used as a reason to place coastal streams on the 303(d) list.

Water Temperature - A Key Factor

Water temperature varies seasonally. If water temperature conditions are very unfavorable, even for short periods of time, some salmon populations may be reduced or eliminated from the watershed. For this reason, it is not useful to evaluate water temperature as an average annual condition; this would mask the effect of temporary but intense problems. Instead, one must consider how seasonal extremes or short-duration events effect the salmon living in a stream.

Maximum Daily Temperature and the Seven Day Maximum Average

Stream temperature information is collected by placing recording units (thermographs) in the stream. Themograph devices collect data all year long, and then are plugged into a computer where their data is downloaded. Temperature devices often collect in-stream temperature hourly over the course of the year. From the large amount of data a thermograph collects two numbers are found that indicate how good or bad stream temperature conditions: Maximum Daily Temperature, and Seven Day Maximum Average. The first is a simple measure of the peak temperature at the site each day. The official or regulatory standard "Seven Day Moving Average of the Daily Maximum Temperature" is the key number to look for. This number is derived from thermograph data collected over the course of the summer warm season. It represents the warmest average combination of any continuous seven daily maximum temperatures.

The Oregon Water Quality Standards have set a general temperature threshold of 64° F (17.8° C). When spawning of cold-water fish is occurring, or where bull trout habitat exists, the threshold is 55° F (12.8 °C).

Step 7: Fill in Form 4 -- Water Quality

To begin filling in Form 4, have the **Decision Matrix** before you.

Question 1. List the stream segments from the Decision Matrix that fall within the watershed. This won't be hard because the Decision Matrix lists the stream segments in order as they proceed through the basin. Also, the way DEQ and EPA have broken Oregon streams into segments for the purpose of water quality evaluation may not be the same as some other stream segment schemes. Your identification of stream segments later in the assessment process (Section 4) will be different from the segments identified in the Decision Matrix.

Question 2. For any stream segments listed in question 1, write the segment name and all the parameters that were considered of concern. This might seem like a repeat of the parameter listing you did in Form 2, but in this form the parameters are organized by each segment.

Question 3. Look under the first column, *Name and Description*, to see which segments are actually **listed** as water-quality-limited. This is important information. State and federal governments are obligated to begin a process to fix water quality problems in listed streams.

Question 4. Thermograph data, as described above, is compiled by many agencies and organizations (DEQ, Forest Service, BLM, Watershed councils) and is stored in many different locations. Unfortunately, right now it is not possible to get the Maximum Daily Temperature or 7 Day Maximum Average for all thermograph sites. Coast Range Association staff is working to acquire and provide you with this data. Currently, the Decision Matrix is the simplest way of accessing temperature information. If your team wishes to investigate this issue further, we will help you find the thermograph data that have been collected for your area.

Questions 5 & 6. For now, just leave these questions blank unless information for them is available through your watershed council, federal Watershed Analysis, or the Coast Range Association.

Question 7. Start asking around for who is known to have collected thermograph data in your basin. Building a list of agencies, organizations, or landowners who have collected thermograph or other water quality information is important and may prove invaluable later in work to restore the watershed. Your ODFW biologist is a good person to ask for this information.

Question 8. Temperature problems and land use. If temperature is a known problem in the watershed, what land uses or other human impacts are causing increased temperatures? Do not include natural conditions like, "the underlying geology makes the watershed prone to summer warming." The loss of forest cover is the most likely cause of warm water, but the specifics may vary among watersheds.

Consulting your local ODFW biologist:

Your local ODFW biologist may suspect or be aware of water quality problems not mentioned on the Decision Matrix. Ask for his or her professional opinion about issues not formally acknowledged or identified in the Decision Matrix.

- **The DEQ website is found at:** http://waterquality.deq.state.or.us

Section 4:

Salmon Populations & Salmon Habitat Assessment

This component of the Rapid Assessment compiles available information on fish populations and in-stream habitat and is the **core** of the Rapid Assessment Project. Please do not be intimidated by the forms or data sheets. As with the prior sections, the work will prove to be easier than it first looks. The fact that we are providing your team with benchmarked habitat stream surveys will make your work much easier.

The fish and habitat assessment section will enable the team to:

(1) Document the presence and distribution of anadromous fish species,

(2) Inquire about the management and condition of anadromous fish within the basin, as part of the ODFW biologist interview,

(3) Identify streams or parts of streams (stream segments) meaningful for characterizing habitat conditions,

(4) Review benchmarked stream habitat data, and connect problem habitat conditions to known land use. In the absence of stream survey data, the team will rely on completed Watershed Analyses or seek the best available professional opinion about habitat conditions.

The Coast Range Association has provided your team with all stream habitat survey data for your basin and the **maps necessary to locate exactly where the surveys were conducted**. A key task of the assessment is to locate the survey maps to the correct subwatershed in the basin. The survey data is printed one survey reach to the page. We have provided a file folder for each 6th-field watershed, in order to organize maps, overlays, and data. Eventually, your team will have a set of folders for all water quality and habitat data, completed form sets, and the base map with overlays.

Stream Survey Data and Benchmarks:

Having stream survey data is important but the real pay off is when the data is benchmarked. Fortunately, we have been able to benchmark the data in the office. For example, look on a survey data sheet to Large Wood. Notice the number will generally be in the range of 0 to over 10. Now look at the benchmark box to the right of the data. You will notice that if the value is less than 1 the evaluation is **undesirable**. If the value is between 1 and 3 the benchmark evaluation is **at risk** and if greater than 3 the benchmark evaluation is **desirable**. Study the benchmark tables (Tables 7a and 8a) and the accompanying field definition (Tables 7b and 8b) sheets to familiarize yourself with the survey data.

A Note on Benchmarks

We know that the only conditions that work for salmon are ***natural*** conditions. Yet OWEB and the federal government are assuming that fewer habitat elements than existed under natural conditions will adequately support some proportionally smaller number of fish. Habitat parts are assumed to act in some unknown relation to fish population numbers. **This is most likely not the whole story**. In fact, the whole benchmark system might be an illusion, and a dangerous one at that. For example we all live in houses. Now imagine if some part of your house were removed, for example 25% of the roofing shingles. Then 10% of the walls were removed. We would quickly see that the **integrity** of the house is undermined, and its suitability for habitation (living in) has been compromised.

Salmon habitat may work like the above example. The scientific community doesn't know what works over long periods of time as the natural elements of complex stream habitat are altered. The best scientists themselves are unsure of what works for salmon other than natural conditions. While we are not satisfied with the official benchmark standards, they are "official" and the only thing we have to go by at this time.

To start this section's work you will want to have the following items:

1. The ODFW Basin management plan,
2. Any available fish population and distribution information for the watershed,
3. CRA provided ODFW and Siuslaw National Forest stream survey data and location maps,
4. CRA provided federal Watershed Analyses,
5. The Base Map and overlays prepared previously by your team,
6. Any available assessments conducted by your local watershed council,
7. Forms 5a,5b,5c, 6, 8, and 9,
8. A labeled 6th-field file folder.

What to Do:

Step 8 -- Identify Anadromous Fish Population & Distribution

In order to complete this component you will either refer to existing watershed assessments, consult ODFW River Basin Fish Management Plans, or rely on the ODFW field biologist's knowledge of fish populations in the basin.

Useful fish population & distribution information sources besides your ODFW biologist.

If someone on your team is particularly ambitious various sources of information on salmon presence and distribution are available.

- **Oregon Plan:** Anadromous Fish core area and distribution information is available in the Oregon Plan (chapter 15) and can be accessed at **http://www.oregon-plan.org**

- **ODFW Basin Plans:** These reports cover many coastal basins. Basin Plans are often the most accessible source of information relevant to fish management. The CRA has copies of all Basin Plans and will provide yours if available.

- **Biennial Report on the Status of Wild Fish in Oregon:** This report includes information on all wild freshwater and estuarine fish species in Oregon. Most of the report comes from ODFW files, particularly annual reports filed by ODFW district biologists, or from research projects. This report can be accessed through the ODFW home page at **http://www.dfw.state.or.us** under "Research and Reports." These reports also contain some information on historic abundance and distribution. For more information contact Kathryn Karstow at ODFW, e-mail at **karstow@dfw.or.gov**

- **Other Trout & Steelhead Distribution:** contact Bob Hooten (503) 872-5252 x 5412.

- **Stocking History:** The records from 1983 are in a database. The codes they used to identify the location of stocking are unique to the hatchery It may be difficult to access all information specific to your watershed. Contact John Leppink (503) 872-5252 x 5415.

Fish Presence and Management Form

Attempt to use the best available information and note the source wherever possible. Make notes of any conflicting information. The goal of these forms is to document what fish are in the watershed and what is known about their population status. Most of this information will come from the ODFW field biologist interview. The ODFW Basin Plan (if available) should be reviewed prior to interviewing the ODFW biologist. Don't let the Rapid Assessment project get stalled on this information. We have provided these forms to get you started in compiling salmon population information.

Step 9 -- Create A Salmon Location Map

Review the available fish presence information on your basin. For this assessment we are only asking that you map the distribution of coho, chinook, and steelhead. The base map indicates the extent of fish utilization in the watershed. Be aware that the ODF stream maps show the limit of all fish presence which will include a far greater stream mileage than that used by chinook, steelhead and coho. As a first cut, look at all available information and create an overlay showing Coho, Chinook, and Steelhead stream use.

Pin a clean layer of acetate over your base map. Label it "**salmon presence overlay**" and use the following colors to identify where each species is known to be present.

Chinook - Red line
Coho - Orange line
Steelhead - Green line

If hatchery fish are present in the watershed use dashed lines in the above colors per species to indicate their distribution.

You now have a **draft** fish distribution overlay. Now it's time to enlist the help of the local ODFW fish biologists, or other agency biologists who have worked in the watershed. They can help review the draft overlay and make the necessary judgment calls in developing a finished fish distribution map.

What if no fish distribution information is available?

If no salmon presence maps are available, defer this portion of the Assessment until later. We will work with your team to help locate the information you need.

Step 10 - Identify & List Stream Segments

This is an important step in the assessment process and involves more art than science. The idea is to **identify streams or parts of streams that you expect to have broadly similar habitat conditions.** The question to ask is: How large of a stream area can we identify so that the benchmark characterizations hold true? Stream habitat conditions within a single subwatershed are often relatively uniform, most likely due to similar land use history. However, where some of the best federal forest land intermingles with private industrial forest land conditions may change between the private and public sections. Sharp changes in topography and land form may cause stream conditions to change. If a particular stream lies within two distinct land use areas of the watershed and you have cause to think that habitat conditions within the stream segments change (i.e. riparian conifer tree presence), identify each area as a segment on the form.

Your first cut at listing the stream segments of the watershed is just that - - a first cut. As time goes by and the team learns more about the specifics of each subwatershed you may change your list.

Step 11 -- Locate survey data to its proper 6th-field

We have provided your team with all stream surveys for your basin. Some teams may have over 150 surveys to locate to their appropriate 6th-field. Each stream survey has a one-page locator map at the same scale as the Base Map.

a. The first task is to collate together the benchmarked survey sheets to their proper locator map (in the three ring locator map binder). Each survey sheet and locator map that belong together have the same name.

b. Using two or three of the team members most knowledgeable of streams it will not take long to figure which 6th-field folder each survey (data sheets and locator map) belongs in. We recommend placing all survey data sheets and locator maps in their 6th-field folders in one work session.

Step 12 -- No Survey Data - Determine Benchmark Characterizations from Professional Opinion and/or Watershed Analysis

Fill in Form 8 in the absence of Stream Habitat Survey Data. It will be likely that one or more of your stream segments will need to be characterized by a professional. If a watershed analysis includes your 6th-field, look through it to find information about habitat elements (e.g. pool quality, substrate condition, large wood abundance). If you find a statement or characterization of habitat elements, note it and the page number where it is located on Form 8. Even with an available Watershed Analysis it may be a good idea to ask a professional biologist familiar with the watershed for his or her opinion on key habitat elements. Form 8 is to be used for characterizing whole stream segments. A Watershed Analysis generally makes characterizations at a broader scale, sometimes about whole subwatersheds.

In the spaces provided at the top of form 8 include the names of information sources, like:

1. Sam Jones, Siuslaw Biologist, Mapleton Ranger District or,
2. Siletz/Yaquina Watershed Assessment, 1995

If a federal Watershed Analysis is available, you will look in likely sections or chapters to find statements that characterize critical habitat elements. Often there will be a quantity referred to, such as "5 pieces of key large wood per mile," which you should indicate in the "Specific Survey Habitat Element" column. In the case where the analysis makes a statement about Pools (or Substrate or Large Wood, etc.) as a general statement rather than about specific habitat elements, cross out the words under "Specific Survey Habitat Element." Then, under "Characterization," write in the characterization (Desirable, At Risk, Undesirable) that applies to each of the **general categories** (Substrate, Shade, Pools or Large Wood) in the "Habitat Element/Group" column. When you write in a characterization from Watershed Analysis, be sure to indicate what page you found it on.

Interviewing a Professional Biologist

If no watershed analysis has been done or no survey data exists, you will be relying solely on the interview process with the professional biologist. During the interview, have the appropriate benchmark table out for reference (either ODFW or Siuslaw benchmarks as appropriate for the land under question). ODFW, BLM and Siuslaw National Forest fish biologists are familiar with the benchmark standards. The biologist you interview may, however, be relatively unfamiliar with the subwatershed or stream in question. The confidence form for professional opinion should be used to record how well-grounded they believe their opinion is.

There is also an empty space at the bottom of Form 8 that you can fill in with any other Habitat Element that does not fit in any of the categories above it.

Table 7a. ODFW Stream Survey Field Definitions

STREAM	Stream name.
REACH	Stream reach #. The part of the stream surveyed.
ECOREGION	EPA Ecoregion and Subregion.
BASIN	Major basin or watershed associated with the stream.
GRADIENT	Average gradient (percent slope) of the reach.
ACW	Active or bankfull channel width (m). The horizontal distance across the channel at the "bank full" or annual high flow line.
PCTPOOL	Combined percentage (by area) of scour and dammed pools in reach.
CWPOOL	Channel widths/pool. A pool frequency measure calculated by dividing the number of pools by the number of active channel width equivalents in the reach.
RESIDPD	Average residual depth of pool.
COMPOOL_KM	Number of pools with wood complexity score ≥4 per kilometer of reach length.
WDRATIO	Width to depth ratio (calculated in riffles as wetted width/wetted depth).
PCTGRAVEL	Average percent of gravel in surface substrate of all units.
RIFSNDOR	Average percent of sand, silt, and organics in surface substrate of riffle units only.
SHADE	Exposure of stream to sky (percentage of 180 degrees) based on vegetation and topography.
LWDPIECE1	Pieces of large woody debris/100m of stream length.
LWDVOL1	Volume of large wood/100m of stream length.
KEYLWD1	Key pieces of large wood per 100m of stream length.
CON_20PLUS	Number of conifer trees over 50cm dbh/1000ft of stream length.
CON_36PLUS	Number of conifers trees over 90cm dbh/1000ft of stream length.

Table 7b. ODFW Habitat Benchmarks for Western OR

POOLS	UNDESIRABLE	DESIRABLE
POOL AREA (% Total Stream Area)	<10	>35
POOL FREQUENCY (Channel Widths Between Pools)	>20	5-8
RESIDUAL POOL DEPTH		
SMALL STREAMS(<7m width)	<0.2	>0.5
MEDIUM STREAMS(≥ 7m and < 15m width)		
LOW GRADIENT (slope <3%)	<0.3	>0.6
HIGH GRADIENT (slope >3%)	<0.5	>1.0
LARGE STREAMS (≥15m width)	<0.8	>1.5
COMPLEX POOLS (Pools w/ wood complexity >3)km	<1.0	>2.5
RIFFLES		
WIDTH / DEPTH RATIO (Active Channel Based)	>30	<15
GRAVEL (% AREA)	<15	≥35
SILT-SAND-ORGANICS (% AREA)		
VOLCANIC PARENT MATERIAL	>15	<8
SEDIMENTARY PARENT MATERIAL	>20	<10
CHANNEL GRADIENT <1.5%	>25	<12
SHADE (Reach Average, Percent)		
STREAM WIDTH <12 meters	<60	>70
STREAM WIDTH >12 meters	<50	>60
LARGE WOOD* (15cm x 3m minimum piece size)		
PIECES / 100 m STREAM LENGTH	<10	>20
VOLUME / 100 m STREAM LENGTH	<20	>30
"KEY" PIECES (>60cm dia. & ≥10m long)/100m	<1	>3
RIPARIAN CONIFERS (30m FROM BOTH SIDES CHANNEL)		
NUMBER >20in dbh/ 1000ft STREAM LENGTH	<150	>300
NUMBER >35in dbh/ 1000ft STREAM LENGTH	<75	>200

* Values for Streams in Forested Basins

Table 8a. Siuslaw N.F. Stream Survey Field Definitions

HUC Hydrological Unit Code.

NAME Name of the creek and usually the year of the survey and tributary number if applicable.

REACH A relatively uniform stretch of stream (i.e., basically the same gradient, channel width, etc.).

MILES Length of the reach in miles.

%P Percent of the stream area composed of pools.

%R Percent of the stream area composed of riffles.

%G Percent of the stream area composed of glides.

%S Percent of the stream area composed of side channels.

POOL>3' Number of pools greater than 3 feet deep.

AVG Average Maximum Pool Depth.

LW12 Large Wood 12 inches dbh by 25 feet long per mile of stream.

LW24 Large Wood 24"x 50'/mile.

LW36 Large Wood 36"x50'/mile.

KEY "Key" Large Wood greater than >24"wide x 50'long per mile.

POOLS Pools/mile

MEAN Mean width

W/D Wetted channel width to channel depth

CW/P C/W Pool: pool frequency (channel widths between pools)

Post 1996 Stream Survey Riffle Substrates fields

SA Sand**, GR** Gravel**, CO** Cobble**, BO** Boulder**, BR** Bedrock

Pre 1996 Stream Survey Riffle Substrates fields

SA1 Sand**, GR1** Gravel**, CO1** Cobble**, BO1** Boulder**, BR1** Bedrock

BFW Bankfull width

Table 8b. Siuslaw N.F. Habitat Benchmarks

	NOT PROPERLY FUNCTIONING	PROPERLY FUNCTIONING
POOLS		
POOL AREA (% Total Stream Area)		
Basaltic Headlands:	≤20	≥35
Rest of Province:	≤30	≥50
POOL FREQUENCY (Channel Widths Between Pools)	≥20	<8
POOL QUALITY (% of Habitat Units >3 feet deep)	≤10	≥20
OFF CHANNEL HABITAT (% Area of Side Channels, etc.)	≤5	≥10
RIFFLES		
WIDTH / DEPTH RATIO (Active Channel Based)	>12	<10
SUBSTRATE (% of Gravel Dominated Riffle Habitat)	≤20	≥50
LARGE WOOD		
"KEY" PIECES (>24 in. x. 50 feet long)/ MILE	≤30	≥80

Section 5

Connecting Land Use to Habitat

Watershed processes, such as large wood recruitment and sediment production, are impacted by the condition and management of the land. This fact is noted in the OWEB Manual, the CRA Watershed Manual and numerous federal Watershed Analyses. Restoring watershed processes **towards** natural conditions is the only strategy likely to work for maintaining or restoring salmon habitat.

So far in the Rapid Assessment process you and your team have organized a great amount of information around one or more 6th field watersheds in your basin. In Section 1 the team documented 6th field watershed land use and created a Land Use Overlay for the Base Map. You have listed known **potential issues** surrounding salmon habitat loss in Form 2. Working through Section 2 the team identified a key part of the watershed's stream system - response streams. The response stream overlay is a very important work product that laid the basis for identifying stream segments to characterize for habitat conditions.

In Sections 3 and 4 you documented and organized information on **water quality** and **salmon distribution.** Section 4 presented two sets of benchmarks - one from the State of Oregon and one used by the federal government.

Form 6 prompted the team to identify the main streams and tribs for the purpose of habitat characterization. These "stream segments" are areas of generally similar habitat conditions. The **Stream Survey data sheets** organized data elements from stream surveys and provided a benchmark evaluation of each element. In the absence of survey data, **Form 8** provided a format for recording a professional opinion/assesssment of stream segments for several habitat element groups. Locating habitat surveys to their 6th-field and completing Forms 6 and 8 organized a powerful set of information about the habitat condition of specific stream segments in your watershed.

Now it's time to make the connection between land use, suspected watershed issues, and the habitat information. **Forms 9** & **10** are designed for that purpose. Connecting benchmarked habitat conditions to land use issues completes the circle and is a key pay off of your work.

Based on how the data and professional opinion describes your watershed you will be able to speak strongly to the need for forestry and agricultural management reform. Perhaps the data or professional evaluations indicate the watershed's fish habitat is in good shape - - this is important information for identifying potential **rufugia** areas. Perhaps the data and evaluations present a clouded picture of some good and some bad conditions. There may even be data and land use conditions that **confound** what might be expected. However, it is very likely that the data and evaluations will present a consistent picture of severe habitat loss for one or more key habitat categories and that the severity of habitat loss will be logically associated with the dominant land use and principle secondary land use.

Step 15 - Fill In Form 9 Land Use - Habitat Indicator Checklist

We provided this form to help you identify **which habitat indicators (elements) are linked to a specific issue**. Form 9 allows your team to answer this question: Does stream habitat data and professional evaluation **confirm** (support) suspected water quality and stream habitat issues? It is important when confirming water quality or stream habitat issues that the data or information have a logical or physical connection to the issue.

Check only those habitat elements on Form 9 that:

1. Have failed a benchmark standard (**Undesirable, Not Properly Functioning** or **At Risk**)
2. Are characterized as less than Desirable or Not Properly Functioning by professional opinion in Form 8 or
3. Have been reported as not properly functioning in a Watershed Analysis.
4. Have been identified in the Decision Matrix as severe enough to cause the stream segment's 303d listing.

Step 16 - Filling in Form 10. Connecting Land Use to Habitat

Place before you the following work products:

- Form 2, Potential Watershed Issues
- Form 4, Water Quality Questionnaire (for temperature issues)
- All ODFW and Siuslaw Survey Data for the subwatershed
- All Form 8s Habitat Characterization from Professional Opinion for the watershed
- Base Map with land use and stream segment overlays
- The Form 9 Checklist

a. Fill in the Dominant Land Use

Off of Form 2 fill in the dominant land use on Form 10. For the great majority of Coast Range 6th fields the dominant land use will be forestry. However, whether the dominant land use is forestry or agriculture it will be important to pause at this moment and consider the specifics of how the dominant land use impacts watershed processes. The OWEB manual and the CRA manual speak of many ways that forestry, agriculture and roads impact a watershed. It is very important that the associations **suggested** in Form 10 between habitat problems, issues and land use be reasonable and fair.

b. Choose an issue from Form 9 connected to the dominant land use

Form 2 identifies all potential land use issues. Form 9 indicates which issues are likely a problem for a stream segment. Now you are at the point that requires judgment and understanding of basic watershed processes as well as the specific land uses impacting stream habitat conditions. Pin both the stream segment and land use overlays to the Base Map. Notice which land uses are close to the stream segment and upstream of the segment. Get a sense of where each land use is occurring. If forestry is the dominant land use, what does the team know about the condition of

the forest along the stream, upslope from the stream and upriver? How intensively have the trees been cut and what is the general age of the watershed's forest. Refer to the ownership and forest type and size numbers we have provided. They will help in evaluating land use in the 6th field.

If rural settlement or agriculture is present what do you know about past human activity in the watershed? Being local residents you probably have some sense of what the history of the watershed is.

Write the first issue identified in Form 9 in the second column - Confirmed Watershed Issues. Now review your benchmarked stream surveys. List all substandard habitat elements, element groups (Form 8) or parameters (Decision Matrix) that support the issue in the next column Habitat Element or Parameter on Form 10. Place a check mark (✓) in Form 10's Confirming Prof Opinion column if the supporting element came from a professional characterization in Form 8. Place the letters **WA** in the Confirming Prof Opinion column if Form 8's supporting element came from a Watershed Analysis document. In the next column note the benchmark characterization. In the last column note the stream segment where the element came from.

C. List the next issue

Choose the second issue to list and repeat the listing of supporting elements. You very well might need a second form sheet for the dominant land use. In that case, staple both sheets together.

D. Repeat the above process for secondary land uses

If no one on the team feels confident to work through forms 9 & 10, schedule a working meeting with a CRA staff person and we will help the team through several form sets. We feel confident that the simplicity of this project will be come apparent after several 6th-fields are assessed. Don't let the appearance of the form set weaken your resolve to complete the project.

The Rapid Assessment Forms Set

Form 1. General 6th-field Watershed Information

Form 2. Land Use & Potential Watershed Issues

Form 4. Water Quality Questionnaire

Form 5. Fish Population and Management Questionnaire

Form 6. List of 6th-field Streams to Characterize

Form 8. Stream Habitat Characterization from Professional Opinion

Form 9. Issue - Habitat Indicator Check List

Form 10. Connecting Land Use to Habitat

Form 1. General 6th-field Watershed Information

ODFW Basin Name: _____

Subbasin Name (4th field): _____

Watershed Name (5th-field): _____

Subwatershed Name (6th-field): _____

Official 6th-field HUC Identifying Number: _____

Name of USGS Quad(s): _____

_____

Ecoregion(s) _____

Number of Acres in Subwatershed: _____

Mean Elevation	Minimum Elevation	Maximum Elevation

Mean annual precipitation in inches: _____

Rapid Assessment Team:
(Place in Master Manual)

1. _____ Phone #_____

2. _____ Phone # _____

3. _____ Phone # _____

4. _____ Phone # _____

5. _____ Phone # _____

6. _____ Phone #_____

7. _____ Phone # _____

8. _____ Phone # _____

9. _____ Phone # _____

10. _____ Phone # _____

Form 2. Land Use & Potential Watershed Issues

Watershed Name (6th-field):_____&#_____

1. Land Use

Identify and rank land use by area. (Largest area = #1, etc.)

Land Use #1:_____ Acres_____

Land Use #2: _____ Acres_____

Land Use #3: _____ Acres_____

Land Use #4: _____ Acres_____

Check if one of the following issues applies to the subwatershed:

____ Roads Road Density per square mile _____ Total Linear Distance _____(mi.)

_____ Mining

_____ Dams

_____ Irrigation network

2. Issue Identification

a. Listed Fish Species - check the following if their listing applies to the watershed

____ Coho ____ Fall Chinook

____ Steelhead ____ Cutthroat Trout

____ Other _____

b. Water Quality Issues

Which 303(d) Parameters are listed for the watershed?

_____

_____

Check Potential 303(d) Parameters suspected to be present in the watershed.

Parameter:	Criteria (e.g. Rearing 64 F):
_____ Habitat Loss	_____
_____ Sedimentation	_____
_____ Aquatic weeds/algae	_____
_____ Chlorophyll A	_____
_____ Bacteria	_____
_____ pH	_____
_____ Biological criteria	_____
_____ Dissolved oxygen	_____
_____ Flow modification	_____

3. Land Use and Suspected Issues (See Table 3)

Land Use #1:_____

_____Habitat Related_____	**_____Water Quality Issues_____**
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____

Land Use #2:_____

Habitat Related	**Water Quality Issues**
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Land Use #3:_____

Habitat Related	**Water Quality Issues**
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Land Use #4:_____

Habitat Related	**Water Quality Issues**
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.