



Mid-Coast Water Planning Partnership

Mid-Coast Water Planning Partnership Meeting AGENDA

February 22, 2018

Best Western Agate Beach, Jasper / Onyx Room
3019 N. Coast Highway, Newport, Oregon

3:30 PM **First Timers – Come early for an orientation to the Partnership!**
4:00 PM **Partnership Meeting**
8:00 PM **Informal discussion**

Meeting Objectives:

- Review status of Partnership work – recap accomplishments of Steps 1 and 2.
- Review work plan and schedule for Step 3.
- Form and orient the working groups.

Time	Topic	Lead
3:30 pm	First Timers' Orientation Complimentary buffet dinner will be available	Jitesh Pattni, ODFW
4:00 pm	Welcome <ul style="list-style-type: none">• Meeting Objectives and Agenda• Introductions• Announcements / Updates (Field Trip report, etc.)	Tim Gross and Harmony Burright
4:20 pm	Status of Partnership work	Facilitators
4:45 pm	Process of ratifying local co-conveners	Tim Gross
4:55 pm	Break and Charter Signing	
5:10 pm	Work Plan – Step 3: Identify Current & Future Needs	GSI Water Solutions
6:10 pm	Formation of Working Groups	GSI Water Solutions
7:10 pm	Work Groups Report Out	Working Groups
7:40 pm	Status of Funding	Co-Conveners
7:55 pm	Wrap Up and Next Steps	Facilitators
8:00 pm	Social Time	

Stay connected - www.midcoastwaterpartners.com



Mid-Coast Water Planning Partnership

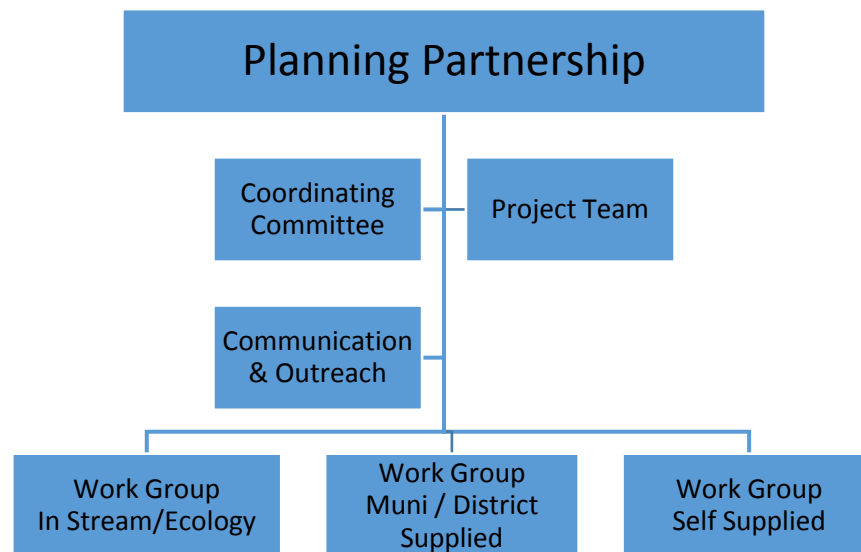
Current Partners

- ☐ City of Newport - Co-Convener
- ☐ OR Water Resources Dept - Co-Convener
- ☐ Alsea Watershed
- ☐ Bay Hills Water Association
- ☐ Beverly Beach Water District
- ☐ Chase Park Grants
- ☐ City of Lincoln City
- ☐ City of Toledo
- ☐ City of Waldport
- ☐ City of Yachats
- ☐ Civil West Engineering
- ☐ Coastal Residents
- ☐ Confederated Tribes of Siletz Indians
- ☐ Community Gardens
- ☐ Economic Development Alliance
- ☐ Lincoln County Economic Development Alliance
- ☐ Georgia Pacific
- ☐ Gibson Farms
- ☐ GSI Water Solutions
- ☐ Hancock Forest Management
- ☐ Innovative Growth Solutions
- ☐ Lincoln County
- ☐ Lincoln Soil and Water Conservation District
- ☐ Local Citizens
- ☐ MidCoast Watersheds Council
- ☐ Newport Chamber of Commerce
- ☐ Newport Community Gardens
- ☐ NOAA National Marine Fisheries Service
- ☐ Panther Creek Water District
- ☐ Private Landowners and Rural Homeowners
- ☐ Oregon Cattlemen's Association
- ☐ Oregon Farm Bureau
- ☐ OR Dept of Agriculture
- ☐ OR Dept of Land Conservation and Development
- ☐ OR Dept of Environmental Quality
- ☐ OR Dept of Fish and Wildlife
- ☐ OR Dept of Forestry
- ☐ OR Dept of Parks and Recreation
- ☐ OR Watershed Enhancement Board
- ☐ Oregon SeaGrant
- ☐ OSU Hatfield Marine Science Center
- ☐ Panther Creek Water District
- ☐ Regional Solutions, Office of the Governor
- ☐ Representative David Gomberg
- ☐ Robertson Environmental
- ☐ Seal Rock Water District
- ☐ Senator Arnie Roblan
- ☐ Starker Forests
- ☐ NW Steelheaders, Stewards of Rocky Creek
- ☐ Surfrider Foundation
- ☐ The Wetlands Conservancy
- ☐ US Forest Service
- ☐ Weyerhaeuser Co.
- ☐ Watershed Advocate

Coordinating Committee Members

- ☐ **Co-Convener**, City of Newport, Tim Gross
- ☐ **Co-Convener**, Oregon Water Resources Department, Harmony Burright
- ☐ **Water Provider**, Seal Rock Water District, Adam Denlinger (proposed co-convener)
- ☐ **Irrigator/Landowner**, Gibson Farms, Alan Fujishin (proposed co-convener)
- ☐ **Conservation**, Surfrider Foundation, Charlie Plybon
- ☐ **Tribes**, Confederate Tribes of the Siletz, Stan VandeWetering
- ☐ **Business/Industry**, Economic Development Alliance, Caroline Bauman
- ☐ **Governor's Office**, Regional Solutions Team, Jackie Mikalonis
- ☐ **State Agency**, Oregon Department of Fish and Wildlife, Jitesh Pattni
- ☐ **Local Government**, Lincoln County - Terry Thompson; Yachats – Jim Tooke / Rick McClung
- ☐ **Watershed Council**, MidCoast Watersheds Council, Wayne Hoffman
- ☐ **Academic / Student Member / Resident** – Amber Nickerson, Oregon State University

PARTNERSHIP STRUCTURE AND ROLES



- ☐ **Planning Partnership:** Broad group of stakeholders –
 - ☐ Identify study-related interests.
 - ☐ Identify current and future water challenges.
 - ☐ Consider quality, quantity and ecosystem needs.
 - ☐ Identify ways to increase resilience.
 - ☐ Plan together to meet future needs.
 - ☐ Provide direction to the Coordinating Committee.
- ☐ **Coordinating Committee:** Subset of Planning Partnership – Approximately 12-14 people. Diverse group representing a range of interests. Convenes between meetings of Partnership Group to:
 - ☐ Provide advice on how to structure stakeholder engagement and communication to ensure that diverse interests are included in the process.
 - ☐ Identify potential issues, gather information, and frame issues for discussion by the Partnership Group.
 - ☐ Communicate with stakeholders about the planning process and issues of interest.
 - ☐ Advocate for a planning process that balances interests.
 - ☐ Provide process support and conduct work to support the Partnership Group.
- ☐ **Project Team (PT):** The PT plans meetings, prepares materials and meeting minutes for the process. Includes local co-conveners City of Newport, Seal Rock Water District (proposed), Gibson Farms (proposed) and state co-convenor OWRD, as well as technical consultants, GSI Water Solutions and Facilitators/Project Coordinators, Innovative Growth Solutions.
- ☐ **Sub-groups:** Topic-specific sub-groups will be designated as needed to work on specific aspects of the plan and/or assist in communication regarding the Study.

Mid-Coast Water Planning Partnership
Place-Based Integrated Water Resources Planning

2018 Calendar (rev 2/12/18)

January 2018							
W	S	M	T	W	T	F	S
1		1	2	3	4	5	6
2	7	8	9	10	11	12	13
3	14	15	16	17	18	19	20
4	21	22	23	24	25	26	27
5	28	29	30	31			

February 2018							
W	S	M	T	W	T	F	S
5					1	2	3
6	4	5	6	7	8	9	10
7	11	12	13	14	15	16	17
8	18	19	20	21	22	23	24
9	25	26	27	28			

March 2018							
W	S	M	T	W	T	F	S
9					1	2	3
10	4	5	6	7	8	9	10
11	11	12	13	14	15	16	17
12	18	19	20	21	22	23	24
13	25	26	27	28	29	30	31

1st in-stream WG 3/21, 22??

April 2018							
W	S	M	T	W	T	F	S
14	1	2	3	4	5	6	7
15	8	9	10	11	12	13	14
16	15	16	17	18	19	20	21
17	22	23	24	25	26	27	28
18	29	30					

May 2018							
W	S	M	T	W	T	F	S
18			1	2	3	4	5
19	6	7	8	9	10	11	12
20	13	14	15	16	17	18	19
21	20	21	22	23	24	25	26
22	27	28	29	30	31		

June 2018							
W	S	M	T	W	T	F	S
22						1	2
23	3	4	5	6	7	8	9
24	10	11	12	13	14	15	16
25	17	18	19	20	21	22	23
26	24	25	26	27	28	29	30

July 2018							
W	S	M	T	W	T	F	S
27	1	2	3	4	5	6	7
28	8	9	10	11	12	13	14
29	15	16	17	18	19	20	21
30	22	23	24	25	26	27	28
31	29	30	31				




August 2018							
W	S	M	T	W	T	F	S
31				1	2	3	4
32	5	6	7	8	9	10	11
33	12	13	14	15	16	17	18
34	19	20	21	22	23	24	25
35	26	27	28	29	30	31	




September 2018							
W	S	M	T	W	T	F	S
35							1
36	2	3	4	5	6	7	8
37	9	10	11	12	13	14	15
38	16	17	18	19	20	21	22
39	23	24	25	26	27	28	29
40	30						




October 2018							
W	S	M	T	W	T	F	S
40		1	2	3	4	5	6
41	7	8	9	10	11	12	13
42	14	15	16	17	18	19	20
43	21	22	23	24	25	26	27
44	28	29	30	31			

November 2018							
W	S	M	T	W	T	F	S
44					1	2	3
45	4	5	6	7	8	9	10
46	11	12	13	14	15	16	17
47	18	19	20	21	22	23	24
48	25	26	27	28	29	30	

December 2018							
W	S	M	T	W	T	F	S
48							1
49	2	3	4	5	6	7	8
50	9	10	11	12	13	14	15
51	16	17	18	19	20	21	22
52	23	24	25	26	27	28	29
1	30	31					

 Partnership Meeting (4-7pm)
 Coordinating Comm. Meeting (9-12n)
 Coordinating Comm. Call - (9-11 am)

 Project Team Call (10-11am) or Meeting
 Milestone
 Working Group Meetings or Calls

 Field Trips TBD
 Public Outreach Event TBD
 CO Group Mtg. TBD

Mid Coast Water Planning Partnership

Synopsis of Steps 1 & 2

2-15-17

Partnership Mission

The purpose of the Mid-Coast Water Planning Partnership is to . . .

Develop an inclusive community forum
which examines water use in the region,
identifies current and potential water challenges,
and creates a unified plan to balance water needs.

Planning process and schedule



Partnership Structure



Recap - What did we do in Steps 1 and 2?

Who's been involved?

- Partnership – 207 on list, 340 contacted, 150 active
- Partners – 50+ signed Charter
- 7 Partnership meetings – 50 avg.
- 8 Study Group meetings – avg. attendance 12 ea
- 5 C/O Meetings – avg. 10 ea
- 16 Coordinating Committee Meetings – avg. 10 ea.

What did we accomplish?

- Governance structure – Charter, MVV
- Communication & Outreach Plan
- Technical Reports – Quantity, Quality, Ecology, Built Systems, Context
- Common baseline understanding of water resources in Mid Coast
- Collaborative relationships
- Shared technical info., resources, assistance amongst Partners
- Secured grant funding
- Established web page to keep everyone informed

Strategic Intentions

<p>Mission / Purpose</p> <p><i>Defines the overall mission or purpose of the Partnership.</i></p>	<p>The purpose of the Mid-Coast Water Planning Partnership is to develop an inclusive community forum which examines water use in the region, identifies current and potential water challenges, and creates a unified plan to balance water needs.</p>
<p>Vision</p> <p><i>Defines the aspirational future that the Partnership hopes to accomplish.</i></p>	<p>Regional partners ensuring balanced water resources for the environment, the economy, and coastal communities.</p>
<p>Goals</p> <p><i>Defines the primary goals that will guide the work of the Partnership.</i></p>	<p>Work collaboratively to develop an Integrated Water Resources Plan that:</p> <ul style="list-style-type: none"> • Protects the environment and ensures healthy watersheds. • Balances the needs of our ecosystems, our economies, and our communities. • Creates sustainable systems that are resilient to climate change and natural hazards. • Provides ongoing education on the values of our water resources. • Supports stewardship of our water resources. • Secures the financial, technical, and practical resources needed to further these goals.
<p>Guiding Principles / Shared Values</p> <p><i>Identifies the key principles or values that will guide how the members work together as a Partnership.</i></p>	<p>The following principles guide how we will work together.</p> <ul style="list-style-type: none"> • Partnership. We recognize different perspectives and seek common ground to develop strategies that meet our collective needs. • Transparency. We create an inclusive process to openly share information and interests, invite curiosity and encourage dialogue. • Innovation. We bring our best ideas and information to the table and explore innovative, out-of-the box solutions. • Commitment. We act in good faith to support the success of the Partnership in developing strategies that are in the best interest of the region. • Flexibility. We are open to new ideas and approaches and will adapt our process or approach to fit the needs of the Partners. • Action. We seek practical near-term actions as well as longer term strategies consistent with our goals. • Clarity. We commit to expressing all of our findings in the simplest and clearest form possible.

Summary of Partnership Discussions

Summary of outcomes, issues, needs, vulnerabilities, identified at Partnership meetings. Results are listed in order of *frequency mentioned by table groups*. Note that this is a compilation of table group summary reports and does not represent an accurate count of individual statements.

Desired Outcomes

Identified at 9/29/16 Partnership meeting. *Further detail is presented in Appendix A (pages 6-7).*

- Increased awareness about regional needs (8)
- Sustainable supply for consumptive uses that also protects ecology (6)
Integrated strategies to improve water quantity and quality (4)
- Incentivize conservation (4)
- Resources to implement solutions (4)
- Cross boundary solutions (3)
- Integrated regional water management strategies (3)
- Improve resilience (3)
- A collaborative, future-focused process (3)
- Manage flows (2)
- Funding and financing (2)
- Water rights that benefit all (1)
- Understanding of regulatory context (1)

Key Water Issues on Mid Coast

Summary of issues identified at 9/29/16 and 1/25/16 Partnership meetings. *Further detail is presented in Appendix B (pages 8 - 9).*

- Water quantity – limited supply to meet future demand (23)
- Water quality (21)
- Aging infrastructure; lack of funding (15)
- Watershed health – (13)
 - Impact of upland activities on watershed health
 - Land use impact (forestry, industry, agriculture, residential) on watershed health
- Balance in-stream and out-of-stream needs to support the water cycle (12)
- Climate change and natural forces (11)
- Changing regulations (11)
- Lack of funding to address problems (9)
- Lack of sufficient water storage capacity – not able to capture and store water when it is abundant (7)
- Need for greater water conservation (6)
- Need for education about water issues (5)
- Lack coordination of drinking water systems (4)
- Challenges are unique to the region (1)

Needs¹ and Vulnerabilities²

<i>In-Stream Needs</i>	<i>Out-of-Stream Needs</i>
<ul style="list-style-type: none"> • Better quantify current and future needs (9) <ul style="list-style-type: none"> ○ Data to make accurate projections ○ More gages to better measure flows ○ Quantify in-stream and out-of-stream needs • Decline in in-stream flow impacts fish and ecological systems (6) <ul style="list-style-type: none"> ○ ISWR not being met ○ Insufficient flows for fish & ecology • Water quality is critical, complex, sensitive for both in-stream and out-of-stream (5) <ul style="list-style-type: none"> ○ Quality is impaired by temperature, D/O turbidity, contamination ○ Lack comprehensive water quality testing to understand this issue • Restore natural systems (4) <ul style="list-style-type: none"> ○ Estuaries ○ Riparian areas • High dependence on Siletz withdrawals (4) • Impact of reservoirs on water quality/fish (1) • Healthy water for all species (1) 	<ul style="list-style-type: none"> • Insufficient year-round supply (15) <ul style="list-style-type: none"> ○ Seasonal population variability ○ Need for consistent water supply ○ Future needs from increase in resident and tourist population ○ Increased need for water places too much pressure on available resources ○ Tidal influence limits withdrawals • Industry needs for water – forestry, agriculture, irrigation, fishing, tourism, marijuana (7) • Growth and development of region increases need for infrastructure (6) <ul style="list-style-type: none"> ○ Regional treatment ○ Interties ○ Increased storage ○ Separation of drinking/gray water • Need for increased conservation (4) • Cost of supplied water – potential rate increases (3) • Lack of information on groundwater supply / utilization (3) • Estuary development plans (1) • Unforeseen water use (i.e. forest fires) (1)
Vulnerabilities	
<ul style="list-style-type: none"> • Aging infrastructure (20) <ul style="list-style-type: none"> ○ Aging/failing groundwater wells, leaking septic systems, water loss ○ Big Creek Dam – immediate, high risk ○ Lack of qualified water, wastewater operators • Threats to water quality (17) <ul style="list-style-type: none"> ○ Invasive species ○ Increased algal blooms ○ Contamination from bio-solids applications, septic systems, saltwater intrusion ○ Agriculture and forestry practices ○ Lack of comprehensive water quality testing to understand complex systems • Threats to water quantity (land use, urban, stormwater, agricultural systems) <ul style="list-style-type: none"> ○ Insufficient water supply impacts industry, jobs, economy • Impacts of climate change (12) <ul style="list-style-type: none"> ○ Drought ○ Higher water temperatures, lower flows, impact on consumptive uses and ecology • Lack of sufficient funding to address issues (9) • Impacts of natural disaster (landslides, earthquake, tsunami, storms, floods) (7) • Lack of secure water source and water security (5) • Lack of qualified staff for operation of water and wastewater systems • Water systems not designed for resiliency (1) 	

¹ Needs identified at 1/25/17, 8/8/17, and 11/14/17 Partnership meetings. Reference meeting notes for further detail.

² Vulnerabilities identified at 8/8/17 Partnership meeting. Reference meeting notes for further detail.

Appendix A

Provides more detail on Desired Outcomes summary listed on page 4

Desired Outcomes from this process

- **Increased awareness about regional water needs, challenges, opportunities (8)**
 - Increase awareness of the integrated system
 - Develop understanding of interconnectedness of water resources and impacts on multiple constituencies in our region
 - Increase knowledge of the watershed and increase watershed literacy
 - Increase awareness about water issues and tools that are available
 - Learn from each other
 - Educate the public and general users – get the word out
 - Let people know how they can contribute
 - Greater understanding at the local, state and federal level of regional water needs, challenges and opportunities to be more proactive
- **Develop sustainable supply for consumptive uses that also protects ecology (6)**
 - Move forward with universal water supply that can withstand natural disasters and does not put fish at risk
 - Improve local economy while improving habitat for listed species
 - Identify natural capital of ecosystems
 - Fish and salmon are protected and fisheries remain healthy
 - Ecological integrity
 - Keep beaches clean and usable
- **Develop incentives for conservation (4)**
 - Look at how we pay for water and how to incentivize water conservation
 - Groups using high volumes pay less – need to look at this dynamic
 - Think bigger on how to conserve water
 - Resources/guidelines for conservation – responsible uses for general public and industry
- **Develop cross boundary solutions that help neighbors work together to achieve additive effect (3)**
 - Increased cooperation amongst water districts – increase sharing of water resources, water storage
 - Talk to other communities and coordinate efforts with all local communities (Yachats, Waldport, S. Lincoln Water already coordinate efforts)
 - Better communication between neighbors – especially about unintended impacts

- **Integrated regional water management strategies are planned for and implemented together for improved water quality, quantity and fair access across the board (3)**
 - Intergovernmental agreement that leads to water supply solutions
 - Regionalization and collaboration
 - More coordination and partnerships between communities
- **Improve resilience (3)**
 - Repair water system infrastructure
 - Identify emergency water sources
- **A collaborative, future-focused process (3)**
 - Think 20 years ahead
 - Collaborative process that achieves a product in timely fashion
 - Success with the pilot planning process to support additional funding
- **Manage flows (2)**
 - Increased interest and buy-in to restoration in upper watersheds to store more water, raise water table to relieve low flow in summer
 - Rocky Creek Reservoir and Big Creek improvements
- **Funding and Financing (2)**
 - Come up with very succinct funding request and identify some possible funding sources to support the results of the process
 - Financing to be able to address infrastructure issues
- **Water rights that benefit all (1)**
- **Understanding of regulatory context (1)**

Appendix B – Key Water Issues on the Mid Coast

Provides more detail on Water Issues summarized on page 2

(x) = number of times mentioned

- **Water Quantity - Limited supply to meet future demand (23)**
 - Seasonal flows – demand is highest when flow is lowest
 - Inability to meet demands for domestic, ecological, industry needs
 - Population growth is dependent on service / tourism industry
 - Future water availability for agricultural needs, conservation, fish, wildlife
 - Use emerging technology, efficiencies to reduce water loss
- **Water Quality (21)**
 - Impact of invasive species on supply and quality
 - Up-slope land use impact on water quality
 - Septic system issues – where, how many, and what is impact on quality?
 - Need information on bacterial loads
 - Impact of bio solid application on local wells and water supply
 - Add wastewater into the consideration of the entire water cycle
- **Aging infrastructure and lack of funding to repair and replace failing systems (15)**
 - Aging infrastructure and need for more resilient infrastructure
 - Limited staffing - skilled water technicians needed
 - Small crews can't fix large issues
 - Procedures are difficult – too many hoops to jump through - need to streamline replacement of old infrastructure
- **Watershed health (13)**
 - Impact of upland activities on watershed
 - Land use impact (forestry, industry, agriculture, residential) to water quality and watershed health and how that affects long-term reliability of water resources
 - Impact of pesticides, pharmaceuticals, wastewater land application
 - Lack of overall water quality monitoring programs in area
 - Need for restoration of riparian areas
 - Define tipping point for salmon (water quality and temperature)
- **Balance in-stream and out-of-stream needs to support the water cycle (12)**
 - Protect and restore in-stream flows
 - Fishery / river groups – balance in-stream and out-of-stream
 - Meet instream water rights, identify and then protect peak and ecological flows
 - Cost / benefit analysis needs to account for economics and ecosystem benefits
 - Develop Best Management Practices (BMPs) for the various sectors

- **Climate change and natural forces (11)**
 - Resiliency of water supply – short/long term impact on region and individual communities
 - Dealing with extreme weather fluctuations
 - Potential flood issues
 - Resilience to chronic and natural disasters
 - Land movement effects on water and sewer systems
 - Need for emergency water sources
- **Changing regulations (11)**
 - Endangered Species Act – inability to take water out of rivers
 - Better protection needed – regulations for non-fish streams, especially when the water is chiefly for human consumption
 - Salmon and other species are at risk
 - Private landowners and their water rights
- **Lack of funding to address both short and long-term problems (9)**
- **Lack sufficient water storage capacity - not able to capture and store water when it is available and abundant (7)**
 - Percent of storage low relative to overall use – need additional storage
 - Promote natural storage in the system – use beavers to create natural storage
 - Green infrastructure – improve nature’s ability to capture and store water
 - Security of reservoirs
- **Need for greater water conservation (6)**
 - Water conservation by users – tourists use more water than most residents and are less connected and knowledgeable about the issues
 - Conservation tools and incentives
- **Need for education about water issues (5)**
 - Education on water rights and how they are managed within the state
 - Need to educate the public and industry about water cycle in coastal region
 - Educate the planning group – in-stream flows for fish – are we over allocated?
 - Understand how water moves through our watershed
 - Who uses the water – Highest? Mid? Low? Industry?
- **Lack of coordination of drinking water systems – (4)**
 - Need to manage the water we have
 - Too reactionary – need to be proactive
- **Challenges are unique to coastal regions – water usage in rest of state doesn’t represent the usage here in Mid-Coast (1)**



Work Group Orientation Agenda

February 22, 2018

1. Work Group Introductions

- ❖ Name; Agency and Partnership role (if any); Residence within Mid-Coast?
- ❖ One specific priority issue you want to address with this planning process

2. Work Group “Charge”

- ❖ Prioritize focus issues; support data collection and technical analysis; review findings
- ❖ Move planning process forward; take ownership of the “Plan”

3. Work Group Scoping Document

- ❖ Overview of scoping document purpose, outline and features
- ❖ Work Group Resources

4. Work Group Organization and Roles

- ❖ Spokesperson
- ❖ Coordinating Committee representative
- ❖ Other roles... e.g. “recorder”, “facilitator”

5. Work Group Function

- ❖ General meeting times and format
- ❖ Schedule kick-off meeting?
- ❖ Next steps

6. Work Group Reports

- ❖ Municipal and District Supplied
- ❖ Self-Supplied
- ❖ In Stream / Ecology

Needs¹ and Vulnerabilities²

<i>In-Stream Needs</i>	<i>Out-of-Stream Needs</i>
<ul style="list-style-type: none"> • Better quantify current and future needs (9) <ul style="list-style-type: none"> ○ Data to make accurate projections ○ More gages to better measure flows ○ Quantify in-stream and out-of-stream needs • Decline in in-stream flow impacts fish and ecological systems (6) <ul style="list-style-type: none"> ○ ISWR not being met ○ Insufficient flows for fish & ecology • Water quality is critical, complex, sensitive for both in-stream and out-of-stream (5) <ul style="list-style-type: none"> ○ Quality is impaired by temperature, D/O turbidity, contamination ○ Lack comprehensive water quality testing to understand this issue • Restore natural systems (4) <ul style="list-style-type: none"> ○ Estuaries ○ Riparian areas • High dependence on Siletz withdrawals (4) • Impact of reservoirs on water quality/fish (1) • Healthy water for all species (1) 	<ul style="list-style-type: none"> • Insufficient year-round supply (15) <ul style="list-style-type: none"> ○ Seasonal population variability ○ Need for consistent water supply ○ Future needs from increase in resident and tourist population ○ Increased need for water places too much pressure on available resources ○ Tidal influence limits withdrawals • Industry needs for water – forestry, agriculture, irrigation, fishing, tourism, marijuana (7) • Growth and development of region increases need for infrastructure (6) <ul style="list-style-type: none"> ○ Regional treatment ○ Interties ○ Increased storage ○ Separation of drinking/gray water • Need for increased conservation (4) • Cost of supplied water – potential rate increases (3) • Lack of information on groundwater supply / utilization (3) • Estuary development plans (1) • Unforeseen water use (i.e. forest fires) (1)
Vulnerabilities	
<ul style="list-style-type: none"> • Aging infrastructure (20) <ul style="list-style-type: none"> ○ Aging/failing groundwater wells, leaking septic systems, water loss ○ Big Creek Dam – immediate, high risk ○ Lack of qualified water, wastewater operators • Threats to water quality (17) <ul style="list-style-type: none"> ○ Invasive species ○ Increased algal blooms ○ Contamination from bio-solids applications, septic systems, saltwater intrusion ○ Agriculture and forestry practices ○ Lack of comprehensive water quality testing to understand complex systems • Threats to water quantity (land use, urban, stormwater, agricultural systems) <ul style="list-style-type: none"> ○ Insufficient water supply impacts industry, jobs, economy • Impacts of climate change (12) <ul style="list-style-type: none"> ○ Drought ○ Higher water temperatures, lower flows, impact on consumptive uses and ecology • Lack of sufficient funding to address issues (9) • Impacts of natural disaster (landslides, earthquake, tsunami, storms, floods) (7) • Lack of secure water source and water security (5) • Lack of qualified staff for operation of water and wastewater systems • Water systems not designed for resiliency (1) 	

¹ Needs identified at 1/25/17, 8/8/17, and 11/14/17 Partnership meetings. Reference meeting notes for further detail.

² Vulnerabilities identified at 8/8/17 Partnership meeting. Reference meeting notes for further detail.

1. Work Group Overview

Mid-Coast Place-Based Water Resources Plan

Overall Process Purpose: The overall purpose of the Mid-Coast Water Planning Partnership is to develop an inclusive community forum to: (i) examine water use in the region; (ii) identify current and potential water challenges, and (iii) create a unified plan (Plan) to balance water needs of the Mid-Coast Basin. In the near term, the process will fulfill the requirements of the **Community-Based Water Planning** grant awarded to Mid-Coast Planning Partnership by the Oregon Water Resources Department (OWRD).

Work Group Purpose: The purpose of a Work Group is to explore specific subjects and report back to the Mid-Coast Planning Partnership (PP) that is developing the community-based Plan. Each Work Group is based on a subject-area focus that relates back to the overall purpose and goal for the community-based Plan for the Mid-Coast Basin. It is anticipated that Work Groups would support current planning and future implementation activities that come out of the Plan, and that participants and activities would evolve over the various stages of the planning process. The Work Group will not be a decision-making entity, but will provide input and recommendations to the technical consultant and Partnership.

For purposes of Step 3 in particular, the Work Groups will work with the technical consultant to do the following:

1. Refine and prioritize the subject-area focus issues that will be the focus of the Step 3 needs assessment and Step 4 solutions and strategy development.
2. Identify sources of data and support data collection and review to complete assessment of the focus issues.
3. Self-perform assignments, agreed to by the Work Group, to support technical work being completed by the technical consultant.
4. Review preliminary findings and recommendations from the technical consultant related to the focus issues.

Proposed Work Groups (for Step 3):

- Municipal and Utility District Water Providers Work Group (MDW)
- Self-supplied Water Users (SSW)
- Instream and Ecology Work Group (IEW)

Work Group Function: Participation in the Work Groups will be limited to Planning Partnership members, but no other requirements or restrictions will apply. Participants will self-select during the initial Step 3 Partnership meeting. A “point of contact” will be appointed by each Work Group to streamline communication and coordination with the technical consultant and rest of the project team. It is anticipated that at least one member of the Coordinating Committee will also be part of each Work Group.

The technical consultant will prepare a draft “scoping document” that will guide work listed in items 1-4 above, which each Work Group will help refine and finalize. This will include specifics on how meetings (type, format and frequency) will be conducted. To the extent possible, in-person meetings will ideally be conducted in conjunction with regularly scheduled Partnership meetings. Additional meetings may be set by the Work Group, as needed. Due to limitations on consultant scope/budget, the Work Groups will largely be self-facilitating, but will need to work within the overall timeline of the Step 3 schedule.

2. Mid-Coast Basin Conceptual Model Features Outline

Mid-Coast Place-Based Water Resources Plan

A conceptual model will be developed for the entire planning area and for each of the (eight) drainage areas. The conceptual model is a tool that the Work Groups (and Partnership) can use to succinctly document and communicate the key characteristics and priority technical issues that the Partnership will address under Step 3 (and Step 4). The conceptual model will be a “living document” that will be updated throughout the Step 3, as the Partnership goes through the prioritization process and needs assessment. The following list includes the major features¹ anticipated to be included in the conceptual models:

1. Base Map
 - a. Drainage area delineation
 - b. Land ownership/management (e.g. federal, state, private-for, private-ag, urban)
 - c. Urban centers and other economic
2. Water Quantity Features
 - a. Major rivers/tributaries, lakes, etc.
 - b. General stream flow patterns: timing, tidal influence
 - c. Recharge patterns and groundwater availability
3. Water Quality Features
 - a. Major point sources
 - b. Major non-point sources
4. Ecology Features
 - a. Key aquatic species (by annotation)
 - b. Areas of ecological importance
5. Out-of-Stream Needs Features
 - a. Muni-providers and districts (diversions/service areas)
 - b. Major self-supplied users (diversions)
 - c. Conservation needs
6. In-stream Needs Features
 - a. Existing instream restrictions or known flow-limited reaches
 - b. Instream limiting features (dams, fish passage obstructions)
 - c. Key habitat restoration needs
7. Infrastructure
 - a. WTP and WWTP (discharge points); and other major water infrastructure
 - b. Supply vulnerabilities (e.g. intakes, dam safety)
8. “Early Action” Solution Features
 - a. Infrastructure (e.g. AMR, storage, interties)
 - b. Restoration/remediation
 - c. Management
 - d. Legal/administrative (e.g. rate structures)

¹ Details, back-up information and basis for including feature in the conceptual model will be included in the Step 3 reports.

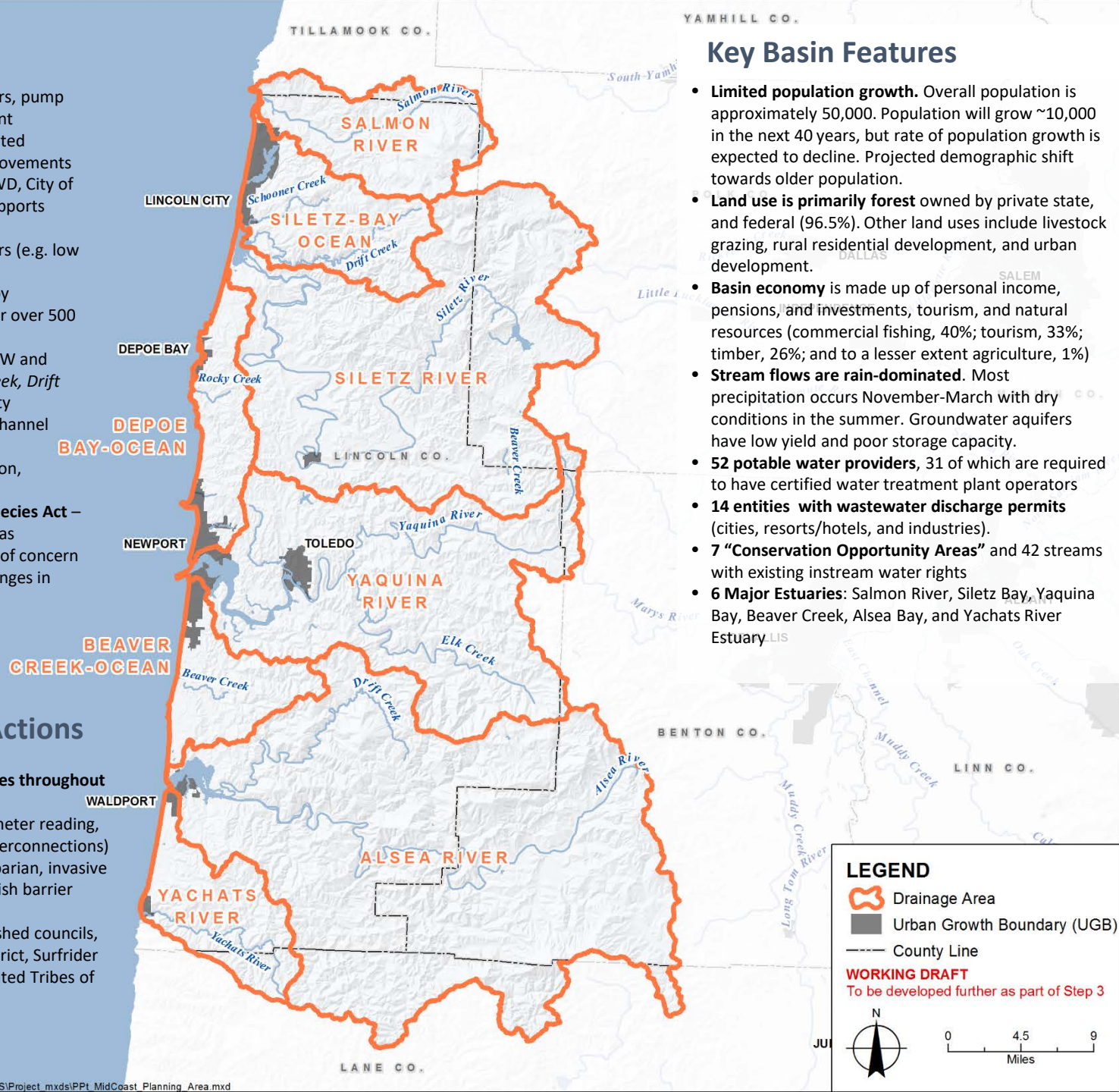
Key Basin Issues

- **Aging infrastructure** (pipelines, reservoirs, pump stations, water and wastewater treatment facilities), few interconnections, and limited financial capacity for infrastructure improvements
- **Siletz River health:** water supply for SRWD, City of Toledo, City of Newport, and GP Mill; supports summer steelhead population
- **Supply vulnerabilities** for water providers (e.g. low summer streamflow; watershed health)
- **Water quality impaired streams** listed by Department of Environmental Quality for over 500 miles
- **Instream flow deficits** identified by ODFW and OWRD for several streams. *Schooner Creek*, *Drift Creek*, *Yachats River* rated highest priority
- **Habitat degradation**, including stream channel simplification and incision, altered streamflow timing and watershed function, turbidity related to peak streamflow.
- **Listed species under the Endangered Species Act** – Coastal Coho and Green Sturgeon listed as “threatened” along with several species of concern
- **Human and ecosystem resiliency** to changes in supply and demand, drought and natural disasters.

Key Basin Strategies/Actions

Planning Partnership will develop strategies throughout Steps 3 and 4

- **System improvements** (e.g. automatic meter reading, pipeline replacements, septic, supply interconnections)
- **Restoration projects** (e.g. in-channel, riparian, invasive species removal, estuary dike removal, fish barrier removal, road improvements)
- **Water quality monitoring** (USGS, watershed councils, Lincoln Soil and Water Conservation District, Surfrider Foundation, cities, DEQ, ODA, Confederated Tribes of Siletz Indians, Weyerhaeuser, EPA)



Key Basin Features

- **Limited population growth.** Overall population is approximately 50,000. Population will grow ~10,000 in the next 40 years, but rate of population growth is expected to decline. Projected demographic shift towards older population.
- **Land use is primarily forest** owned by private state, and federal (96.5%). Other land uses include livestock grazing, rural residential development, and urban development.
- **Basin economy** is made up of personal income, pensions, and investments, tourism, and natural resources (commercial fishing, 40%; tourism, 33%; timber, 26%; and to a lesser extent agriculture, 1%)
- **Stream flows are rain-dominated.** Most precipitation occurs November-March with dry conditions in the summer. Groundwater aquifers have low yield and poor storage capacity.
- **52 potable water providers**, 31 of which are required to have certified water treatment plant operators
- **14 entities with wastewater discharge permits** (cities, resorts/hotels, and industries).
- **7 “Conservation Opportunity Areas”** and 42 streams with existing instream water rights
- **6 Major Estuaries:** Salmon River, Siletz Bay, Yaquina Bay, Beaver Creek, Alsea Bay, and Yachats River Estuary

Siletz Bay-Ocean Drainage Area

Key Issues

1. Devils Lake Water Quality
2. D River/Rec Site Water Quality
3. Infrastructure: Aging, lack of interties

Strategies/Early Actions

1. Backup water supply sources
2. Rock Creek Limiting Factors Analysis
3. IGAs: intertie efforts
4. Devils Lake Improvement District water quality improvement efforts

Key Species

1. Coho
2. Fall Chinook
3. Winter steelhead
4. Pacific lamprey
5. Green Sturgeon
6. White Sturgeon

Priority Water Availability Basins for Streamflow

1. D River at Mouth
2. Schooner Creek at Mouth
3. Drift Creek at Mouth
4. 2 unnamed Streams at Mouth (WAB 0202 and 0201)

Instream Flows

1. Existing: portions of lower Schooner Creek, lower drift Creek, and Rock Creek
2. Proposed: portions of Erickson Creek, Schooner Creek, Drift Creek, and D River

Key Diversions/Users

1. Schooner Creek, LC
2. Drift Creek: LC, K-GB-LB WD

Key Infrastructure

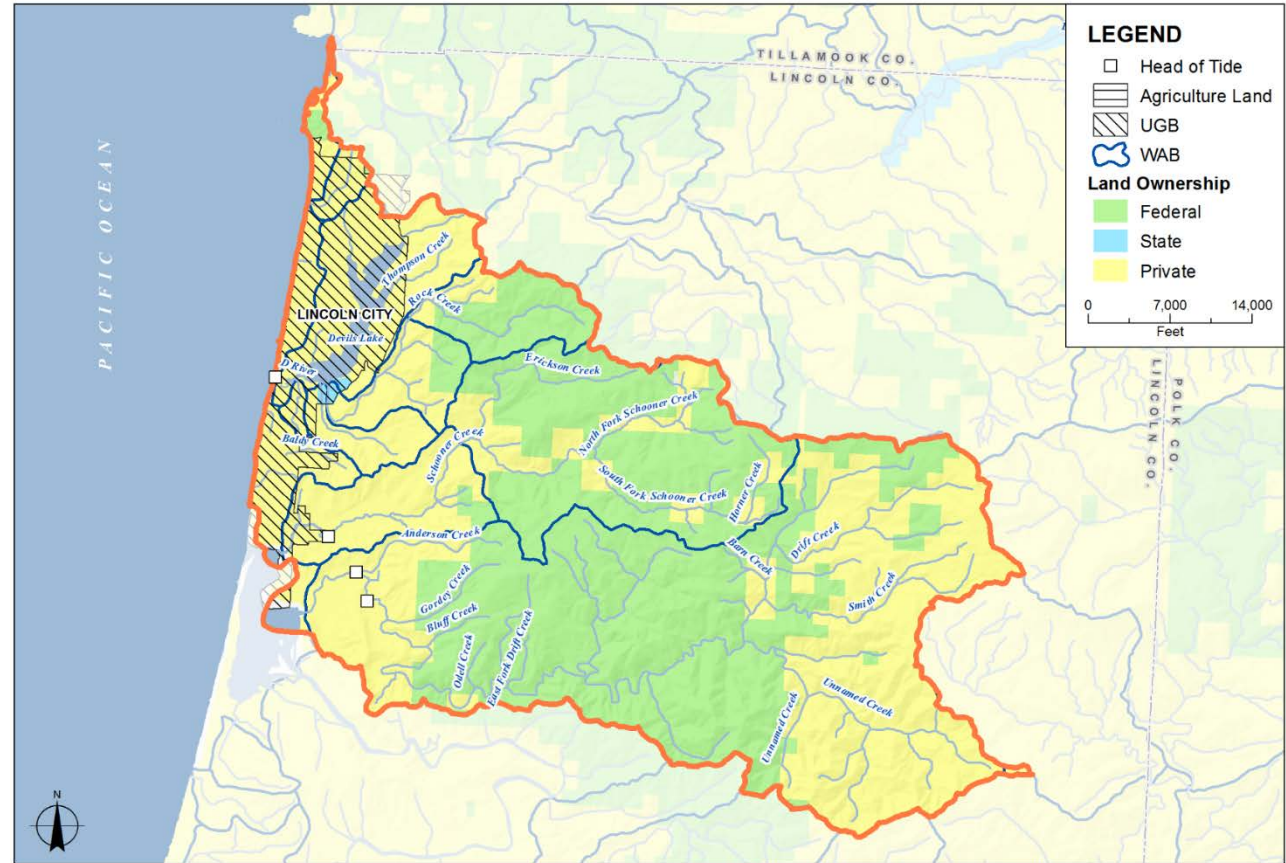
1. Intakes, WTPs, Storage
Reservoirs: LC, K-GB-LB WD
2. LC WWTP and Discharge Point
3. Lack of interties

Water Quality Impairments

1. Schooner Creek: Temp, E. coli
2. Drift Creek: Temp, Bio Criteria
3. Rock Creek: Temp
4. Pacific Ocean/D River: Enterococcus
5. Unnamed stream/Devils Lake: aquatic weeds/algae; Chl a; pH
6. Thompson Creek: fecal coliform

Other Key Watershed Features/Habitats

1. Devils Lake Watershed
2. Drift Creek Area
3. Moolack Frontal
4. Schooner Creek minimum streamflow at intake: 3 cfs



3a. Scoping Document Outline

Municipal and Special District Water Providers

Mid-Coast Place-Based Water Resources Plan

1. Key Drivers

- a. Consider ALL (?) municipal and special district water providers (public systems; or those with need for certified operator)
- b. Consider all existing sources for water provider and current limitations
 - i. Water rights limitations
 - ii. Water availability limitations
 - iii. Water quality limitations
 - iv. Conservation limitations
- c. Current and future water demands
 - i. Annual average and peak demands
 - ii. City planning departments
- d. Current and Future Infrastructure Needs
- e. Risk and vulnerabilities
 - i. To existing sources
 - ii. To existing water system

2. Geographic Scale

- a. Existing water service area
- b. Anticipated expansion of service area
- c. Drainage area or capture zone for each source of supply

3. Time Scale

- a. Planning period (20-, 50-year?)
- b. Periodicity (seasonal, monthly)

4. Hydrologic assessment for priority waterbodies and non-water body areas

- a. Historical flow regimes of waterbodies
- b. Groundwater interactions

5. Water quality assessment for priority water bodies

- a. Presence/absence of Source Water Protection Plan?

6. Vulnerabilities and stressors

- a. “Active” (floods, droughts, landslides, forest fires, earthquakes)
- b. Long-term changes (climate, algal blooms)
- c. Policy changes (e.g. instream water rights)

7. Key Assumptions

- a. Data gaps for analysis
- b. Long-term assumptions

8. Planning Scenarios

- a. Partnership input and key assumptions
- b. Uncertainties

9. Early actions and known/proposed mitigation

10. Key References and Studies

Municipal and District Water Providers

For each Drainage Area the Work Group will support GSI in filling in the Check-list Assessment below to municipal and district water provider needs. GSI will fill in the *Approach* and *Data Sources* after this template is reviewed and approved, and the *Responsible Party* will be identified after the initial Work Group meeting.

Data Need	Approach	Data Sources	Responsible Party
1. Identify (All?) municipal and district water providers			
2. <i>Note: Prior to proceeding with items below, the Work Group can decide which of the water providers identified above are “priority” and those users will be the focus of the assessments below.</i> <ul style="list-style-type: none"> • <i>Priority water providers will be the focus of information presented in the conceptual model</i> 			
3. Compile water rights associated with municipal and district water providers			
4. Compile historic water use (diversion demand) of municipal and district water providers			
5. Determine projected demand growth/expansion of municipal and district water providers			
6. Compile water system infrastructure description and inventory of municipal and district water providers			
7. Compile source water information (surface water and/or groundwater)			
8. Compile water quality information (surface water and/or groundwater) associated with sources			

3. Scoping Document Outline

Self-supplied and Domestic Water Users

Mid-Coast Place-Based Water Resources Plan

1. Key Drivers

- a. Consider MAJOR(?) self-supplied water users in each drainage area (as defined by Work Group)
 - i. All or MAJOR(?) Industrial/commercial
 - ii. All or MAJOR(?) Agricultural
 - iii. All domestic users by generalized rural geographic area (per capita basis)
- b. Consider all existing sources for each self-supplied water user and current limitations
 - i. Water rights limitations
 - ii. Water availability limitations
 - iii. Water quality limitations
 - iv. Water conservation limitations
- c. Current and future water demands
 - i. Annual average and peak demands
 - ii. Community and Economic development input
- d. Risk and vulnerabilities
 - i. To existing sources
 - ii. To existing water system

2. Geographic Scale

- a. Existing locations of self-supplied users
- b. Anticipated/desired new or expanded locations
- c. Drainage area or capture zone for each source of supply

3. Time Scale

- a. Planning period (20-, 50-year?)
- b. Periodicity (seasonal, monthly)

4. Hydrologic assessment for priority waterbodies and non-water body areas

- a. Historical flow regimes of waterbodies
- b. Groundwater interactions

5. Water quality assessment for priority water bodies

6. Vulnerabilities and stressors

7. Key Assumptions

- a. Data gaps for analysis
- b. Long-term assumptions

8. Planning Scenarios

- a. Partnership input and key assumptions
- b. Uncertainties

9. Early actions and known/proposed mitigation

10. Key References and Studies

Self-supplied and Domestic Water Users

For each Drainage Area the Work Group will support GSI in filling in the Check-list Assessment below to self-supplied and domestic water user needs. GSI will fill in the *Approach* and *Data Sources* after this template is reviewed and approved, and the *Responsible Party* will be identified after the initial Work Group meeting.

Data Need	Approach	Data Sources	Responsible Party
1. Identify (major?) self-supplied water users (industrial and agricultural)			
2. Estimate rural population of rural residents			
3. Compile domestic well data			
4. <i>Note: Prior to proceeding with items below, the Work Group can decide which of the users identified above are “priority” and those users will be the focus of the assessments below.</i> <ul style="list-style-type: none"> <i>Self-supplied and domestic water user priorities will be the focus of information presented in the conceptual model</i> 			
5. Compile water rights associated with (major?) self-supplied water users			
6. Compile historic water use (diversion demand) of (major?) self-supplied water users			
7. Compile growth/expansion information of (major?) self-supplied water users			
8. Compile water system infrastructure description and inventory of (major?) self-supplied water users			
9. Compile source water information (surface water and/or groundwater)			
10. Compile water quality information (surface water and/or groundwater) associated with sources			

3c. Scoping Document Outline

Instream and Ecology

Mid-Coast Place-Based Water Resources Plan

1. Key Drivers

- a. Use OWRD/ODFW Priority Basins for Streamflow Restoration and ODFW Oregon Conservation Strategy (OCS) as starting points to identify (e.g. Step 2 Appendix F)
- b. Priority species (e.g. OCS, COMPASS, indicator species)
 - i. Aquatic
 - ii. Terrestrial
 - iii. Other important species (local input)
- c. Ecological functions for priority species
 - i. Based on ODFW OCS (Step 2 – Exhibit 4)
 - ii. Oregon Plan for Salmon and Watersheds (1997)
 - iii. Sixth Field Watershed Assessment for Mid-Coast (2001)
- d. Non-species needs: tribal, recreational, hydropower
- e. Infrastructure priorities/conflicts (dams, other passage issues; Step 2 Appendix H)
- f. Water quality

2. Geographic Scale

- a. Criteria to determine waterbodies of interest based on priority species
 - i. Existing and proposed instream water rights (confirm these priorities)
 1. Significant SW PODs, flow restoration priorities (Step 2 Appendix I)
 - ii. Critical restoration priorities (OWRD/ODFW)
 1. ODFW priority areas for summer streamflow restoration for the recovery of anadromous salmonids (Step 2 Appendix E)
 - iii. Other known impairments by Partnership
 - iv. Other known water use conflicts by Partnership
 - v. Other priority protection opportunities (tribal, recreational, local input)
- b. Criteria to determine non-water body priorities (wetlands, wildlife refuges, riparian, estuaries, etc.)

3. Time Scale

- a. Planning period (20-, 50-year?)
- b. Periodicity (seasonal, monthly)

4. Hydrologic assessment for priority waterbodies and non-water body areas

- a. Historical flow regimes of waterbodies
- b. Groundwater interactions

5. Water quality assessment for priority water bodies

6. Vulnerabilities and stressors

7. Key Assumptions

- a. Data gaps for analysis
- b. Long-term assumptions

8. Planning Scenarios

- a. Partnership input and key assumptions

- b. Uncertainties

9. Early actions and known/proposed mitigation

- a. Habitat restoration efforts in the Mid-Coast
- b. Land management practices

10. Key References and Studies

Instream and Ecology

For each Drainage Area the Work Group will support GSI in filling in the Check-list Assessment below to identify instream and ecological Needs. GSI will fill in the *Approach* and *Data Sources* after this template is reviewed and approved, and the *Responsible Party* will be identified after the initial Work Group meeting.

Data Need	Approach	Data Sources	Responsible Party
1. Identify waterways and waterbodies of interest			
2. Identify species of interest and/or select indicator species; and document presence/ distribution			
3. <i>Note: Prior to proceeding with items below, the Work Group can decide which of the waterbodies and/or key species above are “priority” and those waterbodies/species will be the focus of the following assessments (Items 4-9)</i> <ul style="list-style-type: none"> • <i>Waterbodies and species priorities will be the focus of information presented in the conceptual model</i> 			
4. Compile existing instream water rights and other protected flows and compare to waterbodies of interest			
5. Review ecological functions and their relationship to water quantity (flows, levels, recharge)			
6. Identify tribal water uses associated with priority water bodies			
7. Identify recreational water uses associated with priority waterbodies			
8. Identify hydropower uses associated with priority waterbodies			
9. Identify infrastructure affecting flows and passage associated with priority waterbodies			
10. Compile water quality information (surface water and/or groundwater) associated with priority waterbodies			

4. Focus Area Prioritization Process

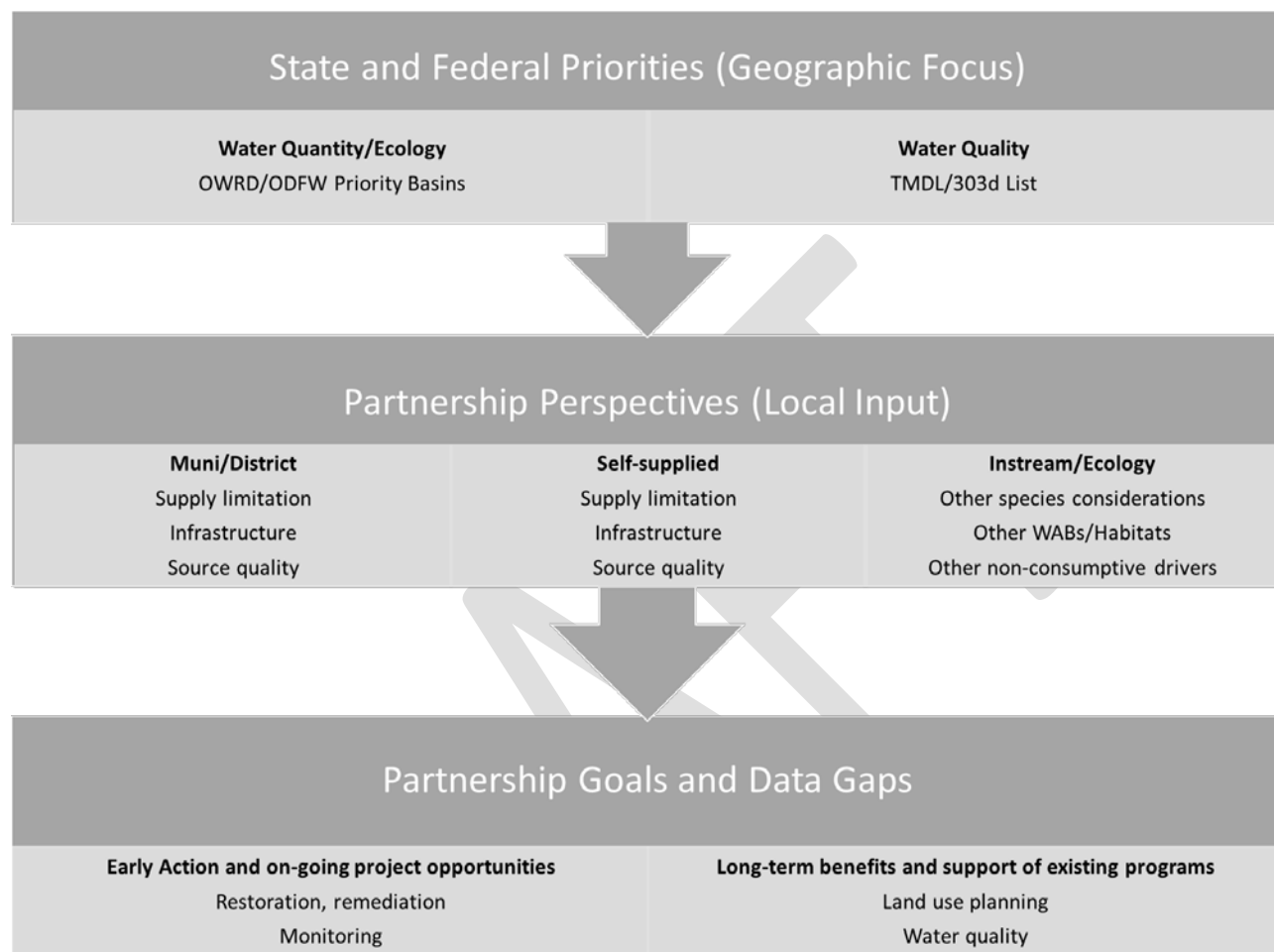
Mid-Coast Place-Based Water Resources Plan

The framework to determine focus areas recognizes the following constraints/limits for this planning process:

- As Step 2 identified, a lot of work has already been done over the years by agencies, interest groups, etc. on related watershed issues.
- There are limited resources (time and funding) to do a lot of “new” analysis or fill data gaps at this stage, and there may be differing opinions on priorities for current and future needs.
- The vision of the Partnership is to continue to further the goals of the plan, i.e. this effort is a snap shot in time with opportunities to continue the work.

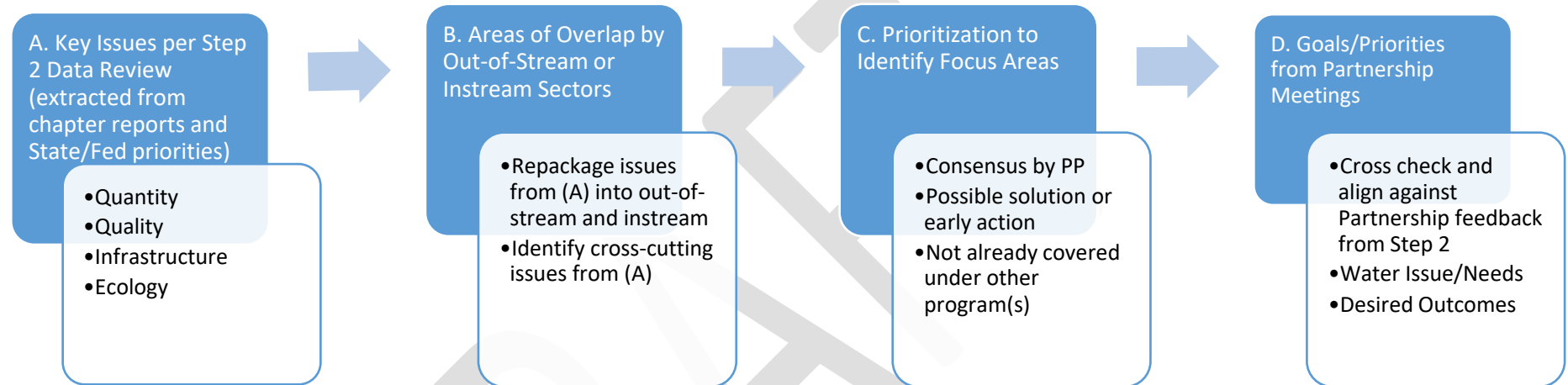
Key aspects of the framework to determine focus areas (by subject and/or geography) include:

1. *State and Federal Priorities.* Identify and integrate various protection/restoration priorities already identified by state agencies based on regulatory or adopted/vetted programs.
 - GSI will utilize published data to identify these priorities. This assumes the work by agencies is generally accepted; any controversial findings/recommendations from agency work can be a lower priority.
 - GSI will identify data gaps or data limited geographic areas in existing State and Federal information
2. *Local input/confirmation of priorities.* Incorporate local input on priorities for needs identified by Partnership members (including those that might have been overlooked by previous efforts).
 - Work Groups will take the first cut at identifying these priorities and GSI will “overlay” these priorities over those from #1.
3. *Align with Partnership Goals.* Prioritize implementation of “low hanging fruit” or those that best align with Partnership’s stated goals and desired outcomes.
 - GSI will identify any existing programs, actions, monitoring already proposed or underway that address (directly or indirectly) issues from #1 and #2 to further prioritize focus areas



In addition to the prioritization process described above, GSI will conduct the following review with the Work Groups to further refine or filter the prioritization, if necessary

Additional Filtering Process to Identify Focus Areas



5. “Water Needs” Outcome

Mid-Coast Place-Based Water Resources Plan

The outcome of the needs assessment will be presented in terms of “direct” and “indirect” needs, and the resource vulnerabilities affecting those needs. The water needs framework utilizes the “conceptual model” of the Mid-Coast Basin Planning Area and the individual (eight) drainage areas that comprise the Mid-Coast Basin to document the prioritized water needs for out-of-stream and in-stream purposes. The conceptual model communicates the key issues and the scoping documents outlines the understanding of data and analysis relationships to determine/quantify those needs.

Out-of-Stream Needs

- Direct water needs for supply for growth (demand projection)
 - How much growth? Where is growth occurring?
 - What are current supplies? What are limitations (availability/seasonality, water rights, water quality, infrastructure)?
- Indirect water needs for future
 - Improved efficiency
 - Economic stimulus
 - *Others?*
- Vulnerabilities
 - Resiliency/redundancy
 - Climate change impacts
 - Threats to water quality (source protection, algal blooms, salt water, land use practices, invasive species)
 - Funding/rate base
 - Lack of staffing (e.g. operators)
 - *Others?*

In-Stream Needs

- Direct water needs for ecological flow (aquatic species)
 - Which species? Where and when are they present?
 - What are current flows (peak and low)? What are limiting flows (diversions, storage, development, upland management)?
- Indirect water needs for future
 - Habitat (in-channel and riparian conditions)
 - Passage/obstructions
 - Temperature and water quality
 - *Others?*
- Vulnerabilities
 - Climate change impacts (flows, temperature, sea level)
 - Threats to water quality (land use practices, invasive species)
 - *Others?*

Types of Solutions

The water needs framework anticipates that Work Groups and the Partnership members in general will begin to identify potential solutions to addressing the needs identified in Step 3. Identifying known or proposed early actions and other potential management solutions in Step 3 will allow the Work Groups (and Partnership) to recognize opportunities to address multiple issues, which can help prioritize issues to focus on. It will also help to identify issues that may best be addressed on a basin-wide or policy-level approach.

Four categories of potential solutions are identified with a list of types of solutions under each:

- **Supply side solutions (how can you affect capture, storage and recharge of water to increase supply at the right time)**
 - Storage (built and natural)
 - Non-traditional supplies (desalination, rainwater harvest, reuse/reclaimed greywater)
 - Watershed restoration
 - Water quality improvements
 - Land management
- **Demand side (how can you manage the timing, amount, and location of demand to effectively meet multiple needs)**
 - Conservation (infrastructure, management, pricing, education)
 - Reuse
 - Other technology
 - Water movement/transactions
 - Voluntary water management actions – coordination of demand management on the shared systems
 - Education/outreach
- **Vulnerabilities (how are you preparing human, natural, and built systems to respond to disturbances/natural hazards)**
 - Watershed restoration
 - Inter-ties and agreements
 - Curtailment plans
 - Emergency management
 - Education
 - Back-up supplies
- **Policy opportunities/barriers (what policy opportunities or barriers may enable or constrain you from implementing solutions)**

The issues-solution matrix on the following page is one example of how GSI (and the Work Groups) can track these opportunities.

Water Needs-Solutions Matrix

	Potential Solutions															
Needs	Supply Side				Demand Side				Vulnerabilities				Policy (Legal/Adm.)			
<i>Direct and indirect (out-of-stream and instream) needs will be identified for each drainage area, and to the planning areas as a whole, where applicable.</i>	<i>e.g. storage</i>	<i>e.g. watershed restoration</i>			<i>e.g. reuse</i>	<i>e.g. water conservation</i>			<i>e.g. floodplain restoration</i>	<i>e.g. land use practices</i>	<i>e.g. intertie</i>		<i>e.g. instream water right</i>	<i>e.g. zoning changes</i>		
Out-of-Stream																
<i>e.g. forecast supply deficiency for specific community</i>																
Instream																
<i>e.g. min/eco-flow along particular stream reach</i>																