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November 19, 2021

RE: Recommendation on Draft Groundwater Management Plans

To Whom It May Concern, including the Idaho Department of Water Resources and Big Wood Ground Water Management Area Advisory Committee:

Since 2015, the Wood River Land Trust, The Nature Conservancy, Trout Unlimited, and the Silver Creek Alliance have coordinated the Wood River Water Collaborative to provide a forum for information exchange, thoughtful dialog, and the development of resources that help create and identify long-term, practical, place-based water management strategies for water management in the Wood River basin. After reviewing the draft Groundwater Management Plans submitted in early November, the Wood River Land Trust, The Nature Conservancy, Trout Unlimited, and the Silver Creek Alliance offer the following recommendations to the Idaho Department of Water Resources and Big Wood Ground Water Management Area Advisory Committee, requesting that the ideas and concepts outlined below be integrated into the Big Wood Basin Groundwater Management Plan (“Management Plan”) for the health and sustainability of the watershed’s valuable ecosystems, now and into the future.

Recommendations:

1. Objectives and Understandings: We support the following objectives and understandings as described in the Groundwater Management Plan proposals and, recommend further, that the following considerations be added:
 - Ensure sufficient instream flows in the Big Wood River, Little Wood River, and Silver Creek to sustain recreational and agricultural based economies, communities, thriving fisheries, and the overall health of the Wood River watershed’s ecosystems.

- Manage the use of groundwater and surface water efficiently and effectively to ensure a sustainable aquifer over time.
 - Minimize the economic and environmental impacts from drought conditions by identifying and implementing appropriate drought planning strategies.
2. Target Flows: We support the delivery of natural flow water as measured at Station 10 and support the creation of additional target flows within the Big Wood, Little Wood, and Silver Creek system that would meet both agricultural water needs and environmental flows. We recommend establishing a minimum of one target flow on the Little Wood/Silver Creek and a minimum of one target flow on the Big Wood. In establishing suitable flow targets we recommend utilizing the diversion rates of the Big Wood and Silver Creek minimum stream flow water rights as suitable flow targets, as they represent the minimum flow suitable for healthy stream ecosystems and the fishery. We also recommend the ability for water transactions, including agreements not to divert, to dedicate water to these target flows per the Management Plan. These minimum stream flow water rights are:
 - No. 37-7727 (99 cfs year-round, Grove/Stalker confluence to Picabo bridge)
 - No. 37-7728 (74 cfs year-round, Picabo bridge to Highway 93 bridge)
 - No. 37-7739 (74 cfs year-round, Highway 93 bridge to Little Wood River)
 - No. 37-7849 (39 cfs year-round, Little Wood to Station 10)
 - No. 37-8258 (200 cfs 3/1-8/31 and 150 cfs 9/1-2/28, SNRA to Warm Springs Creek)
 - No. 37-7919 (70 cfs year-round, Warm Springs Creek to D45 canal)
 - No. 37-8307 (119 cfs year-round, Warm Springs Creek to D45 canal)
 - No. 37-22262 (60 cfs year-round at Stanton Crossing). Although this right is junior to most water rights being considered, it represents a minimum flow into Magic that would support cold-stream aquatic life and the fishery.
 3. Forecasting: The WRWC received funding through the Bureau of Reclamation for the creation of a surface flow prediction model tool specific to the Wood River basin. This tool is meant to incorporate variables utilized in SWSI and other models as well as other basin-specific variables to provide the most accurate surface flow predictions. Once peer-reviewed, we recommend its use in predictive surface flow modeling.
 4. Aquifer and Surface Water Monitoring: We recommend augmenting the hydrologic dataset for the Big Wood River basin with the dataset compiled by Ecosystem Sciences Foundation and adopting their recommendations for future monitoring and data collection.
 5. Fallowing: We support fallowing as a method to conserve water while protecting water rights from abandonment or forfeiture. We recommend evaluating acres proposed for fallowing with the IDWR groundwater flow model (WRV 1.1) to determine impact on surface flows in Silver Creek and tributaries. It may be possible to create an incentive-based program for fallowed acres that would increase flows in Silver Creek and tributaries.
 6. Early Season Recharge: We recommend evaluating the impacts that diverting early season flows could have on the natural hydrology of the Big Wood River and spawning and migration of fish species. We recommend further consulting the Idaho Dept. of Fish and Game to evaluate these potential impacts.

7. Conservation and Efficiency Fund: We support the concept of an annual assessment fee for each acre-foot of groundwater withdrawal to be placed in a conservation fund. These funds could be used in conjunction with other private or grant funds for conservation actions to support the objectives of the Management Plan.
8. Infrastructure Upgrades and Funding: The Wood River Water Collaborative has been successful in receiving Bureau of Reclamation Funds to support cooperative water management planning activities over the past two years. We support prioritizing and implementing projects that reduce the dependency on groundwater for irrigation and improve surface water reliability. Irrigation efficiency projects can, and should, be pursued throughout the basin. The NGOs aim to explore additional funding opportunities through Bureau of Reclamation and other sources that can support infrastructure upgrades and conservation measures. Care should be taken to ensure that efficiency projects do not diminish incidental recharge resulting from ditch loss, thereby further exacerbating water supply shortages.
9. Adoption of Wood River Valley Water Conservation Guidelines and Enforcement: in 2018, Wood River Land Trust worked with a group of representatives from Blaine County, City of Bellevue, the City of Hailey, the City of Ketchum, the City of Sun Valley, industry representatives, local non-profits, and citizens from the community to produce a list of best practices and guidelines for establishing and maintaining landscaping while conserving water resources (see attached). We recommend the adoption of these practices and guidelines for all new developments within the Wood River Valley. We further recommend that each jurisdiction enforce its own standards for residential and municipal irrigation, including days of the week and times of day. If the Management Plan calls for further restriction of water use based on target flows or annual predictive models, residential and municipal irrigation should also be restricted accordingly.

The NGOs would also like to highlight several other recommendations submitted on April 3, 2021, that support Management Plan proposals:

1. Measurement and Monitoring: We recommend establishing mandatory measurement requirements of both groundwater and surface water sources. It may be appropriate to explore the use of telemetry, or other technologies, to streamline monitoring and reporting obligations associated with the Management Plan in order to reduce the burden on the Basin 37 Water Master, as well as foster partnership through increased transparency and accountability. The WRWC will coordinate with water users to identify monitoring and technology needs and continue to research funding opportunities.
2. Ground Water Levels: We recommend establishing a set of criteria to ensure that the efforts implemented through the Management Plan are stabilizing groundwater levels. This may be done by analyzing groundwater levels in mutually agreed upon wells, utilizing mutually agreed upon calculation techniques, and establishing suitable criteria to determine if the actions set forth in the Management Plan are, in fact, effective at stabilize groundwater levels.
3. Demand Reduction: It is recommended that on-farm water reduction measures be implemented, including irrigation equipment improvements (LESA systems, end-gun removal, pivot monitoring and management software), crop transitions, soil health practices, and

fallowing or retirement of marginal lands. Again, demand reduction strategies should be implemented throughout the entire basin.

4. Establish a Water Exchange: We recommend establishing an adaptive water market, local water bank, or “water exchange.” The exchange would facilitate the development, sale, and long-term lease of water rights for the purpose of stabilizing and enhancing aquifer levels (through the retirement groundwater rights, strategic aquifer recharge activities, and implementation of groundwater to surface water conversion projects), enhancing stream flows (by securing natural flow water rights used to satisfy target flows or fill existing minimum stream flow rights). Together these strategies will improve water availability throughout the basin, benefiting all water users.

Thank you for considering our recommendations. We look forward to further discussion on these topics in the coming weeks.

Sincerely,

Wood River Land Trust, The Nature Conservancy, Trout Unlimited, and Silver Creek Alliance

Water Conservation Landscaping *guidelines*

These standards of practices have been drafted by industry experts, local municipalities and nonprofit organizations to promote water saving techniques and efficiency standards. The Wood River Valley is a dry ecosystem averaging 10-18 inches of precipitation a year. Using proper design, watering efficiently, and implementing sustainable practices can reduce the strain on this valuable resource and save water users money.

Soil and Compost. Soils with 25% compost can hold four times more water than soils without composted matter. Compost is an excellent way to amend existing soils or build better soil. By adding compost you improve water infiltration and decrease runoff and erosion. Compost improves the water holding capacity of the soil and improves the microorganism life in the soil which allows plants to utilize necessary soil nutrients and minerals. Healthier plants are able to better withstand drought.

A minimum of 25% compost needs to be added to existing soils because the soil types in the Wood River Valley do not have adequate organic material for water holding capacity.

- All new turf areas require a soil depth of 6": ONE PART COMPOST TO 3 PARTS SOIL.
- All new shrub and flower beds require a soil depth of 12": ONE PART COMPOST TO 3 PARTS SOIL.
- During excavation, existing soil is to remain on site and temporarily fenced to protect from compaction.
- Protect and minimize disturbance of existing trees and vegetation when excavating.

Mulch. Organic mulch is composed of materials such as bark, wood chips, soil pep, and wood compost. Mulch works to keep plants cool, prevent soil crusting, minimizes evaporation and controls weed growth.

- All shrub beds, tree rings, exposed soil and beds should have 4-6" of mulch to minimize evaporation.
- Mulch in tree rings should go from the trunk to the outer drip line of the trees.

Vegetation. Choosing the right vegetation can significantly reduce water use. Native or Drought Tolerant species require 1" or less of water per week.

- All turf species should be native or drought tolerant
- 30% of trees and shrubs should be low-water use plants

Irrigation. Current irrigation system installations have no regulation for efficiency. Without using industry best practices, irrigation systems can waste 40-60% more water than they should. Following the best practices guideline, the user can rest assured that they will have a system that saves water and protects the water resources.

- All landscapes are limited to irrigating .5 acre or less unless there is an additional water right.
- Sprinkler system should have an approved backflow preventer if tied to a potable water source. Backflow should be installed so during winterization no air will be blown through backflow preventer.
- Sprinklers should be laid so that the area is getting hit with a minimum of two sprinklers. This provides for 100% coverage. Recommended overlap would be 5-10%.
- Limit of .60" per hour for sprinkler application rates. ½" bubblers are not recommended due to their high application rate and poor distribution uniformity (coverage).
- All sprinkler types should be pressure regulated to either 40 or 45 pounds of pressure at the sprinkler head to assure uniform sprinkler nozzle distribution rates. 15 psi is recommended for delivery to the far end of any drip zone for proper operation. Recommended spray height: 4" pop up for mowed grass and 12" pop up for natural areas.
- Sprinkler nozzles should have matched precipitation rate so the same amount of water covers each zone.
- Drip should be laid out in a grid pattern so water is uniform in distribution and it is staked to the ground a minimum of every 24" to assure the drip tube stays in contact with the soil.
- Drip pipe should be ½" pressure compensating and also have a check valve to prevent drain out.
- Pots, barrels, or hanging baskets are recommended to have a dedicated irrigation zone. Irrigated with ¼" pressure compensating drip tube no longer than 15' in length. ¼" drip tube shall not be more than .6 gallons per hour water pressure.
- Plant materials with similar water needs should be planted in the same irrigation zone.
- Sun areas and shade areas should each have a separate irrigation zone.
- Sprinkler controller should be able to adjust irrigation automatically via weather station or soil moisture sensor (Time Domain Transmission recommended). Irrigation and Smart Technologies should be installed to industry/manufacturers standards (including 2-wire systems).
- If property has more than 5 feet of elevation change - all sprinkler heads should incorporate check valves to prevent all of the water from draining out of the low heads.
- For larger sprinkler systems with a water supply that is larger than 1-1/2" a flow meter and master valve that is controlled from the sprinkler controller is recommended. Mainlines 3" and larger should use HDPE or Ductile Iron fittings. PVC mainline fittings are not recommended on 3" and larger mainlines.

Drought Tolerant Trees, Shrubs, and Grasses For The Wood River Valley

Watering levels are for plants that have been established for a minimum of one year. These watering levels are above and beyond any natural precipitation that may fall during the growing season. Low = 0.2-0.5 in/week, Medium = >0.5-1 in/week, High = >1 in/week.

S = sun, DS =

dappled shade, s = shade

Conifer Trees

Common Name	Botanical Name	Water Needs	Aspect	Zone
Arborvitae	<i>Thuja occidentalis</i>	Medium	S	3
Fir	<i>Abies</i> spp	Medium	S/DS	3,4
Fir, Douglas	<i>Pseudotsuga menziesii</i>	Medium	S/DS	3
Juniper	<i>Juniperus</i> spp	Low	S	2
Larch (all)	<i>Larix</i> spp	Medium	S	2
Pine	<i>Pinus</i> spp	Low	S	2
Spruce	<i>Picea</i> spp	Medium	S	2

Deciduous Trees

Common Name	Botanical Name	Water Needs	Aspect	Zone
Apple	<i>Malus</i> spp.	low	S	VARIABLES
Apricot	<i>Prunus</i> spp.	low	S	3
Ash, Black	<i>Fraxinus nigra</i>	low	S	2
Ash, Green	<i>F pennsylvanica</i>	low	S	3,4
Ash, Mancana	<i>F mandschurica</i>	low	S	3
Ash, White	<i>Fraxinus americana</i>	medium	S	3
Aspen, Quaking	<i>Populus tremuloides</i>	medium	S	1
Buckeye	<i>Aesculus</i> spp	low	S/DS	3
Cherry	<i>Prunus</i> spp.	low	S	3
Chokecherry	<i>P virginiana</i>	low	S	2
Crabapple	<i>Malus</i> spp.	medium	S	VARIABLES
Elm	<i>Ulmus</i> spp	low-medium	S	4
Hackberry	<i>Celtis occidentalis</i>	low	S	3
Hawthorn	<i>Crataegus</i> spp	low	S	4
Honeylocust	<i>Gleditsia triacanthos</i> spp	low	S	4
Horsechestnut	<i>Aesculus hippocastanum</i>	low	S	3
Lilac	<i>Syringa</i> spp	low	S	3,4
Linden	<i>Tilia</i> spp	medium	S/DS	2,3
Maackia, Amur	<i>Mackia amurensis</i>	low	S	4
Maple	<i>Acer</i> spp	low-medium	varies	2,3,4
Mountainash	<i>Sorbus</i> spp	medium	S	2
Mtn Mahogany	<i>Cercocarpus</i> spp	low-med	S	2
Oak, Bur	<i>Quercus macrocarpa</i>	low	S	2
Oak, Chestnut	<i>Quercus prinus</i>	low	S	4

Oak, Shingle	<i>Quercus imbricaria</i>	low	S	4
Oak, Swamp White	<i>Quercus bicolor</i>	low	S	3
Oak, White	<i>Quercus alba</i>	low	S	3
Pear	<i>Pyrus</i> spp	low	S	3
Plums	<i>Prunus</i> spp.	low	S	3

Evergreen Shrubs and Small Trees

Common Name	Botanical Name	Water Needs	Aspect	Zone
Juniper	<i>Juniperus</i> spp	low	varies	varies
Larch	<i>Larix</i> spp.	low	S	3
Pine	<i>Pinus</i> spp	medium	S	2
Rabbitbrush	<i>Chrysothamnus</i> spp	low	S	2
Soapweed	<i>Yucca glauca</i>	low	S	4
Spruce	<i>Picea</i> spp	medium	S	2

Deciduous Shrubs and Small Trees

Common Name	Botanical Name	Water Needs	Aspect	Zone
Alder	<i>Alnus tenuifolia</i>	medium	S/DS	1,2
Almond, Flowering	<i>Prunus glandulosa</i>	medium	S	3
Barberry	<i>Berberis</i> spp	medium	S/DS	3
Buckthorn	<i>Rhamnus</i> spp	medium	S	3
Buckthorn, Sea	<i>hyppophae rhamnoides</i>	low	S	4
Buffaloberry	<i>Shepherdia</i> spp	low	S	3
Burningbush	<i>Euonymus alata</i>	medium	S	4
Chokeberry	<i>Aronia</i> spp	medium	S/DS	4
Chokecherry	<i>Prunus</i> spp.	low	S	3
Cliffrose, Mexican	<i>Purshia mexicana</i>	low	S/DS	4
Coralberry	<i>Symphoricarpos</i> spp	low	S	2
Cotoneaster	<i>Cotoneaster</i> spp	low	S/DS	3
Cranberry, American	<i>V trilobum</i>	medium	S/DS	3
Cranberry, European	<i>V opulus</i>	medium	S/DS	3
Currant	<i>Ribes</i> spp	low	DS/s	4
Deutzia	<i>Deutzia</i> spp	medium	S	3
Dogwood	<i>Cornus</i> spp	medium	S/DS	1,2
Elderberry	<i>Sambucus</i> spp	low	S	2
Fernbush	<i>Chamaebatiaria millefolium</i>	low	S	4,5
Filbert	<i>Corylus</i> spp	medium	S/DS	3
Forsythia	<i>Forsythia</i> spp	medium	S	4
Gooseberry	<i>Ribes</i> spp	low	S	2
Honeysuckle	<i>Lonicera</i> spp	low	S	4
Hydrangea	<i>Hyrangea</i> spp	medium	DS/s	3
Kinnikinnick	<i>Arctostaphylos uva-ursi</i>	low	S/DS	2
Lilac	<i>Sryinga</i> spp	low	S	3
Maple	<i>Acer</i> spp	medium	S/DS	varies

Mockorange	Philadelphus spp	low	S	4
Mormon Tea	Ephedra viridis	low	S	3
Mtn Mahogany	Cercocarpus spp	low	S	3
Ninebark	Physocarpus spp	low	S	3
Peashrub	Caragana spp	low	S	2
Plum	Prunus spp.	low	S	3
Potentilla	Potentilla spp	low	S	varies
Quince	Chaenomeles spp	medium	S/DS	4
Raspberry	Rubus spp.	low	S	varies
Rose	Rosa spp	low-medium	S	varies
Sagebrush	Artemisia spp	low	S	2
Saltbush, Four Wing	Atriplex canescens	low	S	4
Sandcherry	Prunus besseyi	low	S	4
Serviceberry	Amelanchier spp	low	S/DS	4
Snowberry	Symphoricarpos spp	low	S	3
Spirea	Spiraea spp	medium	S	3
Spirea, Ashleaf	Sorbaria sorbifolia	low	S	4
Spirea, Rock	Holodiscus dumosus	low	S	4
Sumac	Rhus spp	low	S	4,3
Summersweet	Clethra alnifolia	medium	DS/s	2,3
Thimbleberry	Rubus deliciosus	low	S	4
Viburnum	Viburnum spp	medium	DS/s	4
Waxflower	Jamesia americana	low	S	4
Winter Fat	Cerotoides lanata	low	S	4

Ornamental Grasses

Common Name	Botanical Name	Water Needs	height	zone
crested wheat grass	Agropyron cristatum	low	12-18"	3
sideoats grama	Bouteloua certipendula	low	1-2'	3
blue grama	B gracilis	low	1-2'	3
blue fescue	Festuca ovina gluca	low	4-10"	4 to 9
blue acenea grass	helictotrichon sempervirens	low	4'	4 to 9
ribbon grass	Phalaris arundinacea 'Picata'	low	1-3'	4 to 8
karl foerster feather reed	C arundinacea 'Karl Foerster'	medium	2-4'	4
norhern sea oats	Chasmanthim latifolium	medium	3-4'	4
hardy plume grass	Erianthus (Saccharum) ravennae	medium	9-12'	4 to 9
tall fescue	Festuca arundinacea	medium	1-2'	2

Grasses for Xeriscape

Common Name	Botanical Name	Water Needs	height	zone
western wheat grass	Agropyron smithii	low	2-4'	3 to 9
sideoats grama	Bouteloua curtipendula	low	1-2'	3
blue grama grass	B gracilis	low	1-2'	3
hairy grama grass	B hirsuta	low	6-24"	3 to 9

kalm's chess	<i>Bromus kalmii</i>	low	2-4'	3 to 8
bluejoint	<i>Calamagrostis canadensis</i>	low	2-5'	3
prairie sand reed	<i>Calamovilfa longifolia</i>	low	2-6'	3 to 6
Canada wild rye	<i>Elymus canadensis</i>	low	2-5'	3 to 8
virginia wild rye	<i>E. virginicus</i>	low	2-4'	3 to 9
sheep fescue	<i>Festuca ovina</i>	low	1-2'	3 to 9
squirreltail grass	<i>Hordeum jubatum</i>	low	1-2'	4 to 9
June grass	<i>Koeleria cristata</i>	low	1-2'	3 to 9
reed canary grass	<i>Phalaris arundinacea</i>	low	2-5'	4 to 8
glaucous bluegrass	<i>Poa glaucifolia</i>	low	1-2'	3 to 9
inland bluegrass	<i>P. interior</i>	low	1-2'	3 to 9
needle and thread	<i>Stipa comata</i>	low	1-3'	4 to 9
porcupine grass	<i>S. spartea</i>	low	2-3'	3 to 6
purple top	<i>Tridens flavus</i>	low	3-5'	4
bottlebrush grass	<i>Hyssopus patula</i>	medium	2-4'	4 to 9