



Many ag conservation projects in the Lower Boise River area are irrigation conversion projects - changing from flood to pivot irrigation, saving water, labor and improving water quality. (photo by Stan Hays, Canyon SCD)

LOWER BOISE WATERSHED COUNCIL, AG PRODUCERS STEP UP TO IMPROVE WATER QUALITY IN THE LOWER BOISE RIVER

By Steve Stuebner

When the Lower Watershed Council first set goals for improving water quality in the Lower Boise River in the 2000s, the challenge seemed profoundly daunting for all concerned.

At the time, the Lower Boise River did not meet state or federal water quality standards for temperature, sediment, phosphorous and bacteria. Municipal wastewater treatment plants from Boise, Nampa, Meridian and other cities were all discharging increasing amounts of Class A treated water

to the Boise River due to population growth. Agricultural return flows, drains and river-side livestock operations caused the Lower Boise to run chocolate brown below Caldwell and Middleton, carrying heavy loads of sediment and phosphorous into the river.

Water quality standards initially developed through Total Maximum Daily Load (TMDL) baseline plans created by the Idaho Soil and Water Conservation Commission and the Idaho Department of Environmental Quality (DEQ) in 2003 and 2009 projected it would take 140 years to reach recommended water quality

standards just for total phosphorous, for example.

“I didn’t ever think I’d see the light at the end of the tunnel,” said Dan Steenson, an attorney for Nampa-Meridian Irrigation District who has served agricultural interests on the Lower Boise Watershed Council for more than 20 years.

Lower Boise farmers and ranchers were not required to make immediate improvements from a legal and regulatory standpoint, but as an attorney, Steenson knew that the ag producers could be vulnerable to a lawsuit under the

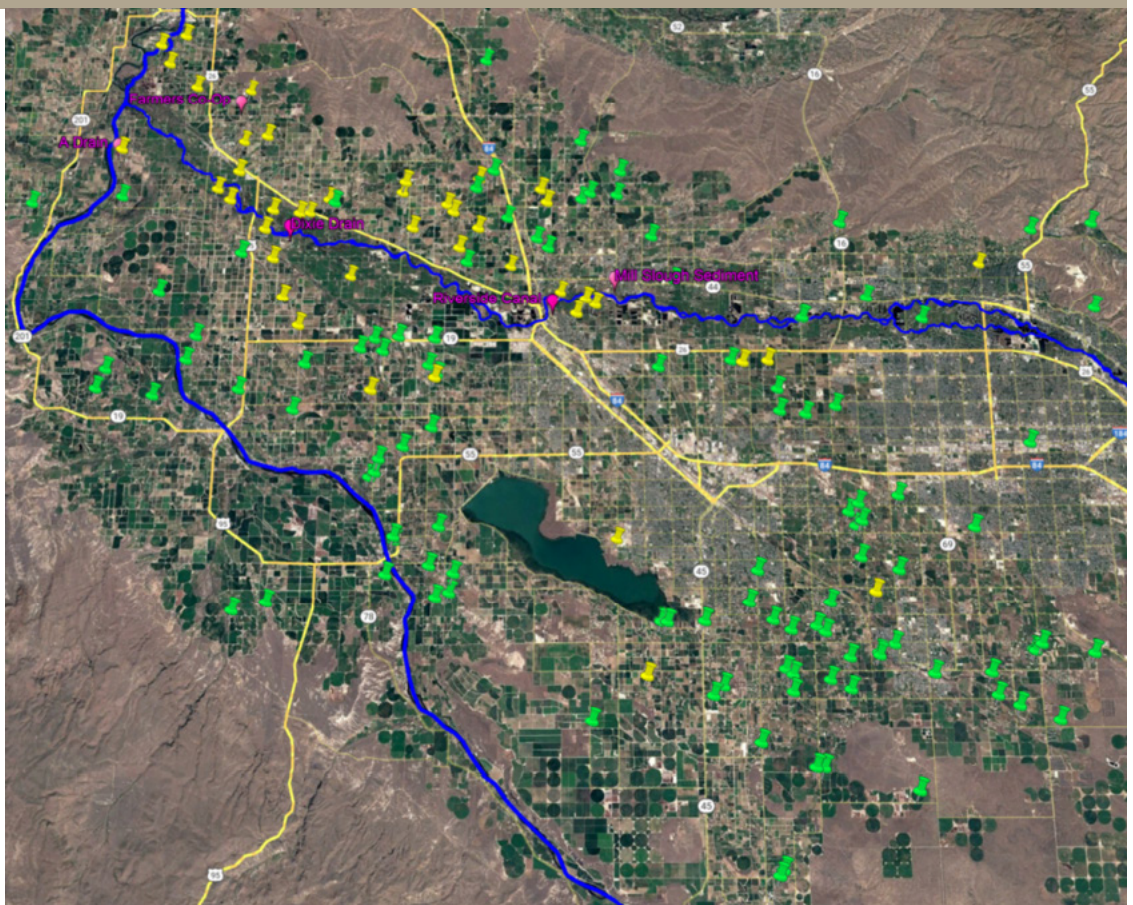
Clean Water Act . So in 2009, he rolled up his sleeves to work together with the members of the Lower Boise Watershed Council, the cities, the Canyon Soil and Water Conservation District, and the Idaho Legislature to beef-up funding for ag-based conservation projects in the area.

“My thought was our best defense would be to create a good offense with more funding for the implementation of conservation projects in the Lower Boise River watershed,” Steenson said. “Participation is voluntary for ag groups, but the cities were spending hundreds of millions of dollars to make water quality improvements, and it made sense for us to do what we could to make improvements.

“Today, we can show that ag has stepped up, and there have been significant reductions in sediment and phosphorous levels in the Lower Boise River.”

Indeed, recent USGS data included in a 2024 report on the Lower Boise River water quality from the Lower Boise Watershed Council (LBWC) and Idaho DEQ shows a strong trendline of substantial water quality improvements since 2009.

On the ag side, approximately 60 conservation projects have been implemented on Lower Boise River farms and ranches with more than \$10 million invested to treat 18,600 acres of land, reducing sediment by 25,500 tons per year and total



Big picture view of ag BMP projects implemented in the Lower Boise Watershed. Green pins indicate use of no-till drills in fields; yellow pins refer to pivot or drip irrigation projects. (Image courtesy DEQ 2024 Lower Boise TMDL Implementation Plan)

phosphorous loads of 53,770 pounds per year, according to the 2024 Lower Boise River TMDL Implementation Plan, authored by the LBWC and Idaho DEQ.

Many of those improvements have been made via converting flood-irrigated lands to more efficient pivot irrigation systems and installing livestock best management practices (BMPs) such as riparian fencing or off-stream water troughs. In addition, there’s also been a major increase in no-till, direct-seed farming in the lower Boise River area.

Over the last 10 years, the implementation of ag BMPs on farms, including pivots, has reduced total phosphorous levels by 92,896 pounds, a savings of 9,290 pounds per year.

Urbanization is playing a big role,

too.

The growth of subdivisions in the Lower Boise area is playing a big factor in reducing sediment and phosphorous loads. Farms converted to subdivisions over the last 10 years have taken about 36,000 acres of

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- Fences
- Livestock Feeding Operations
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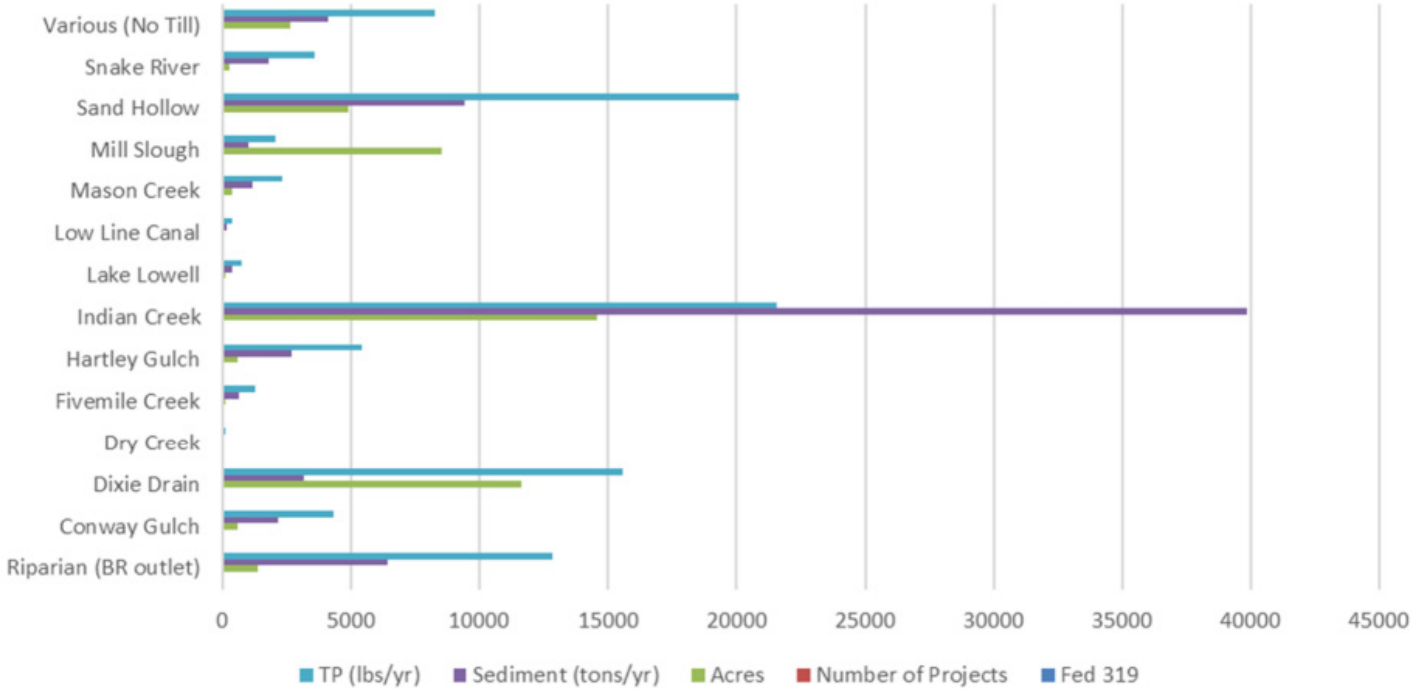
3% - 6% Terms 7-15 Years Up to \$600,000



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Subwatershed Acres Treated & TP Load Reductions



Top image: Chart highlights ag projects in Lower Boise subwatersheds and expected reductions in sediment and total phosphorous. Right, overall non-point source water quality trends for the Boise River and tributaries. (Courtesy 2024 TMDL Implementation Plan.)

land out of production, resulting in a reduction of 216,828 pounds of total phosphorous, according to the Lower Boise DEQ report. Combined, BMP projects and urbanization have resulted in a total phosphorous reduction of 412,392 pounds per year in the Lower Boise River over the last 10 years.

Now Steenson can see the light at the end of the tunnel. “With continued implementation of our water-quality improvement projects and urbanization, we’re seeing that we could reach our total phosphorous goals within a 30 year period,” he said.

The Lower Boise Watershed Council, combining their efforts with the Canyon SCD to improve water quality on ag lands, operate like a well-oiled machine – the Council wins a steady stream funding for conservation projects, the

Canyon District has a roster of landowners ready to step up and implement projects. The Canyon District has seasoned conservation professionals on staff to plan and implement projects with the landowners.

“I think they’re making really good headway, and I think we all are,” said Jeff Barnes, Director of Water Resources for the City of Nampa and Secretary of the Lower Boise Watershed Council. “The funding that they have secured for ag conservation projects is super helpful in directly helping farmers and ranchers in

▲ Significant increase ▼ Non-significant decrease
 △ Non-significant increase ▽ Significant decrease

Main Channel Concentration Results

Site	TP	OP	TN	NO ₂ + NO ₃	NH ₃ + NH ₄	E. Coli	Sediment
Eckert	▼	▼	▼	▼	▼	▲	▼
Middleton	▼	▼	△	△	▼	▼	▼
Parma	▼	▼	△	▲	▼	▼	▼

Main Channel Load Results

Site	TP	OP	TN	NO ₂ + NO ₃	NH ₃ + NH ₄	E. Coli	Sediment
Eckert	▼	▲	▼	▼	▼	▲	▼
Middleton	▼	▲	△	△	△	▼	△
Parma	▼	▼	△	▲	△	△	▼

Tributary Concentration Trends

Site	TP	OP	TN	NO ₂ + NO ₃	NH ₃ + NH ₄	E. Coli	Sediment
Fivemile	▼	▼	△	△	△	--	▼
Tenmile	▼	▼	△	△	▼	--	▼
Fifteenmile*	▼	▼	△	△	▼	--	▼
Mason Creek*	▼	▼	▼	△	▼	--	▼
Mill Slough*	▼	▼	△	▼	△	--	▼
Indian Creek†	▼	▼	△	△	▼	--	▼
Conway Gulch*	▼	△	▲	▲	▼	--	▼
Sand Hollow Creek*	△	▼	--	--	--	--	△

Tributary Load Trends

Site	TP	OP	TN	NO ₂ + NO ₃	NH ₃ + NH ₄	E. Coli	Sediment
Fivemile	--	--	--	--	--	--	--
Tenmile	--	--	--	--	--	--	--
Fifteenmile*	▼	▼	▼	▼	▼	--	▼
Mason Creek*	▼	▼	▼	▼	▼	--	▼
Mill Slough*	▼	▼	▼	▼	▼	--	▼
Indian Creek†	▼	▼	--	--	--	--	▼
Conway Gulch*	▼	▼	▼	▼	▼	--	▼
Sand Hollow Creek*	--	--	--	--	--	--	--

Figure 25. USGS LBR water quality trend summary figures.



Drip irrigation system being installed on a mint field at the Chris Gross farm in Canyon County. (photo by Stan Hays)

basin.

“Everybody’s chipping in, and it’s going to lead to a healthier river.”

Short- and long-range plans for the Lower Boise Watershed identify the highest-priority areas for treatment by sub-watershed. The U.S. Geological Survey has set up additional water-quality monitoring stations to track progress.

Stan Hays, a soil conservation technician for Canyon SWCD, has a strong working knowledge of which state and federal funding programs will work best for producers, having worked with and for farmers, canal companies and the NRCS in the past. He stays busy working with landowners to implement a steady stream of new conservation projects.

“It’s been fun for me, I’m really enjoying it,” Hays says. “I really like working with farmers to install soil and water conservation projects at the ground level. We have a good relationship with our ag partners,

and they get me new producers all the time who are interested in making improvements on their farms.”

Funding for conservation work

The Lower Boise Watershed Council has been tapping into several key funding sources for the on-farm conservation work, beginning with Section 319 grant projects funded by the Environmental Protection Agency/Idaho DEQ, the Commission’s Water Quality Program for Agriculture (WQPA) grant program, and NRCS EQIP funding.

During the Recession in 2009-2012, the Commission’s WQPA funding was suspended. In the meantime, Steenson worked with water users to create the State Agriculture BMP grant fund, administered by Idaho DEQ. The WQPA grant program was restored in 2021-2024.

“Since 2009, the Lower Boise Watershed Council has had a consistent flow of grant money to use for ag conservation projects, partnering with farmers to make

improvements,” Steenson said. “Knowing that we can count on consistent funding, it’s easier to plan and implement projects in partnership with the Canyon Soil and Water Conservation District. They’ve got great connections with farmers and ranchers who are ready to implement projects.”

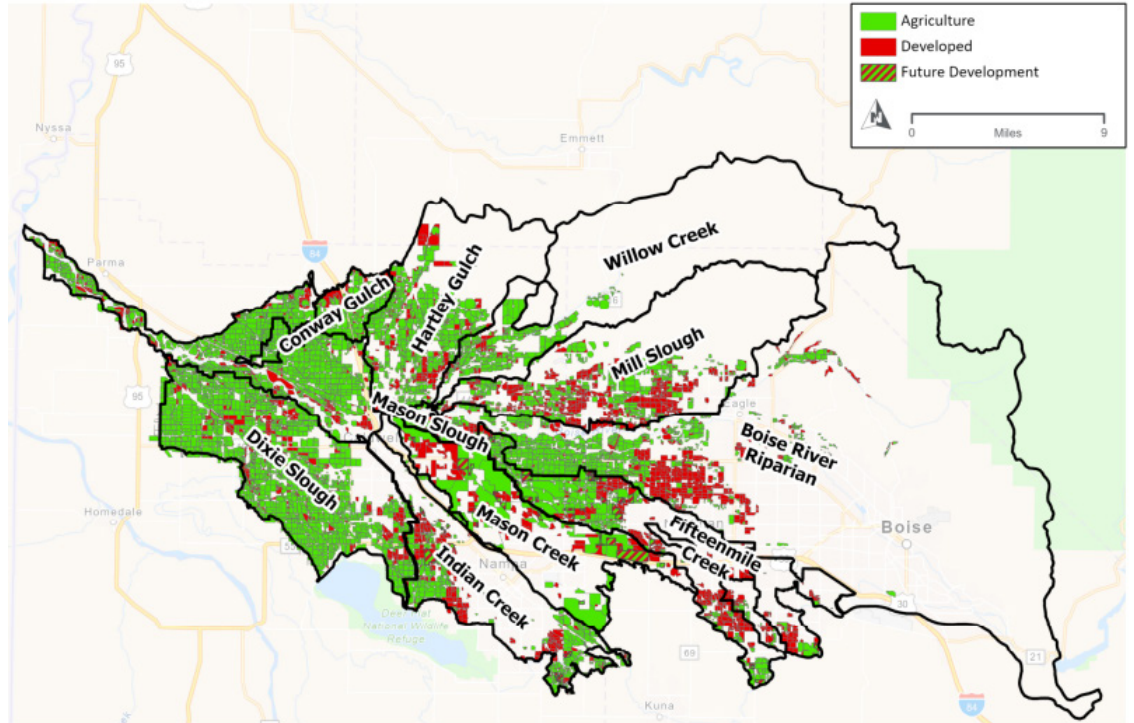
Recent water quality projects

Jeff Johnson, a Canyon County cattle rancher, recently completed a conservation project that converts a flood irrigation system to three pivots, utilizing funds from WQPA, Lower Boise Watershed Council, and the landowner. The project also involves installing a new pumping station with a Variable Frequency Drive (VFD) technology for water-efficiency, a water-control structure and filtering systems.

Johnson is converting an open-ditch irrigation system to 1,750 feet of buried pipelines for additional water savings.

“Converting to buried pipelines from open ditches further exemplifies water savings of the water supply by yielding no loss at all,” Haye said.

The project location is directly adjacent to the lower Boise River. “The goal of this project will be not only to improve the water use efficiency of the landowner’s operation but make a considerable impact in reducing the amount of sediment and nutrients from running into the lower Boise River,” he said.



AGRICULTURAL AND DEVELOPED LAND IN THE TREASURE VALLEY 2016 - 2023

The project also will improve operations and crop yield on the 136-acre farm. By converting to sprinkler irrigation through center pivots, the water savings is estimated to be one to two acre-feet per acre, while crop production will increase between 12 and 20 percent, depending on the crop.

The benefits analysis indicates that pre-project, the sediment loading was 4 tons per acre. By converting the 136-acre farm parcel to sprinkler irrigation will prevent 551 tons of sediment, 1,100 pounds of phosphorus, and 1,763 pounds of nitrogen from flowing into the Boise River each year.

While the water quality improvements are significant, Haye said the big incentives for producers to convert to pivot irrigation are reduced labor costs, water efficiencies and often times, increased crop yields.

Chris Gross drip irrigation project

Chris Gross raises mint, as well as wheat, beans, carrot seed, teff

and popcorn seed on her farm in Canyon County near Wilder. With a WQPA grant, she wanted to explore installing a drip-irrigation system on two fields that were previously flood-irrigated.

The \$290,000 project received funds from WQPA, the Mint Research Industry Council, AM Todd (Mint Buyer), and Gross to convert two separate parcels, one 48 acres, and another 30 acres (approximately one mile apart), from flood-irrigated cropland to a drip-tape irrigation system.

The new irrigation system includes a buried mainline at both field locations that converts a concrete/open ditch conveyance system to a buried pipeline.

“This was really more of an experimental project to see how it worked with raising the mint crop. It’s very labor-intensive,” Gross said. “We see it as a pilot project that others could learn from.”

The time and cost of installing the drip tape system in the fields was

too high to justify normally, she said, because the income from the mint crop wouldn’t cover the cost.

But there were water savings and water quality benefits to the Lower Boise River from converting to the drip system. The project reduced sediment by 226 tons/year, nitrogen by 361 pounds/year and phosphorous by 723 pounds/year, the grant report said.

No-till farming on the rise

The Canyon SCD has three no-till direct-seed drills that are available for rent in the Lower Boise area and beyond – a 6-foot drill, a 12-foot drill and a 15-foot drill. A map of no-till projects shows that the practice is becoming more widespread.

“We have dairies that are seeding triticale behind the corn crop to keep a cover on the soil,” Haye said. “We also have producers who are seeding triticale following a wheat crop. Some landowners with cattle are seeding cover crops following wheat harvest, and then grazing the cover crop. And some are drilling in

alfalfa.”

Jeff Johnson is one cattle producer in the Lower Boise who is grazing cattle on cover crops. He said that is working well on some hilly cropland he has near Parma. “It helps with holding the soil in place,” he said.

Flood Control District #10 bank repairs

Boise River Flood Control District #10 is another partner in the Lower Boise River Watershed Council. They get funds through the Idaho Water Resource Board’s Flood Management Grant Program for a variety of projects that reduce sediment via streambank repairs on the Lower Boise River.

Flood #10 has two projects on tap for the winter of 2024-25 in the Middleton area that will address streambank erosion with a series of bank barbs and rock rip rap to deflect the force of the main current of the river away from the streambank. One project will address streambank erosion on 80 feet of the river on the Mulchay property with two bank barbs and some gravel removal; a second project will address 280 feet of eroding riverbank with three bank barbs and some gravel removal.

Boise River Flood Control District #10 recently completed a \$350,000

	TP Cumulative Reduction (lbs)
2009	5,232
2010	6,335
2011	8,513
2012	10,179
2013	11,482
2014	49,649
2015	50,969
2016	59,729
2017	64,554
2018	69,897
2019	75,672
2020	85,096
2021	87,621
2022	92,768
2023	98,378

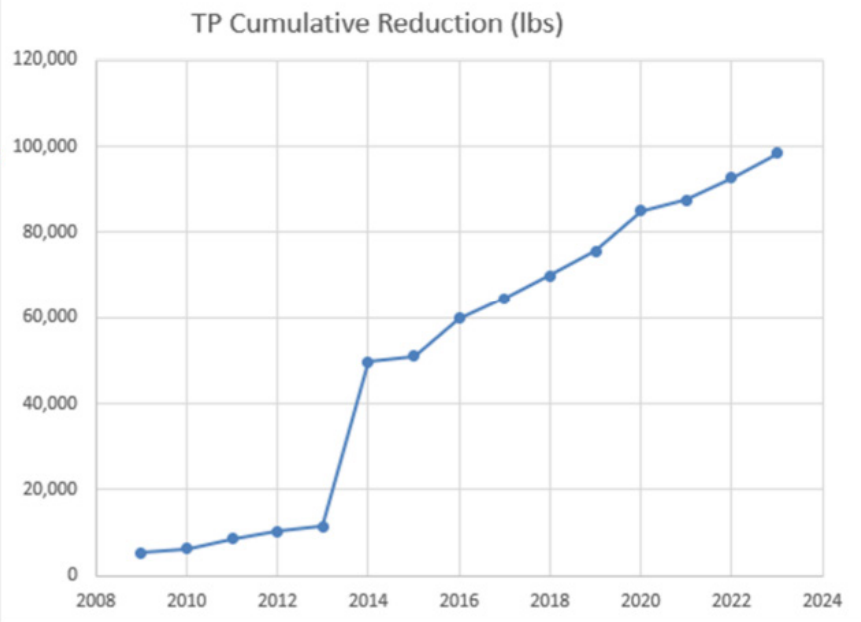


Figure 57. Cumulative TP reductions from LBWC Program and NRCS projects.

flood management project on the Boise River near Middleton to enhance river flow and prevent bank erosion on private property. Half of the project’s cost was funded by a \$175,000 flood management grant from the Idaho Water Resource Board.

Contractors for Flood #10 recently finished in-stream and riverbank-restoration work, including the integration of willows and riparian vegetation for bank stability. They also removed approximately 48,000 cubic yards of gravel in a ¼-mile section of the Boise River.

How is the water quality now?

A graphic from the 2024 Implementation Plan shows current water-quality trends for the main Boise River and its tributaries (see

details on page 3). For the main-stem Lower Boise River, the trends for most non-point sources are improving (shown in blue); the same is true for most of the tributaries.

It takes a team effort to improve water quality in the watershed, Barnes noted.

“The Lower Boise Watershed Council is a great group of people working together toward a common goal. What I’ve noticed is that we have really good communication between all of the groups and agencies involved on the Council. In my experience, that’s extremely rare.”

Steve Stuebner writes for Conservation the Idaho Way on a regular basis.

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