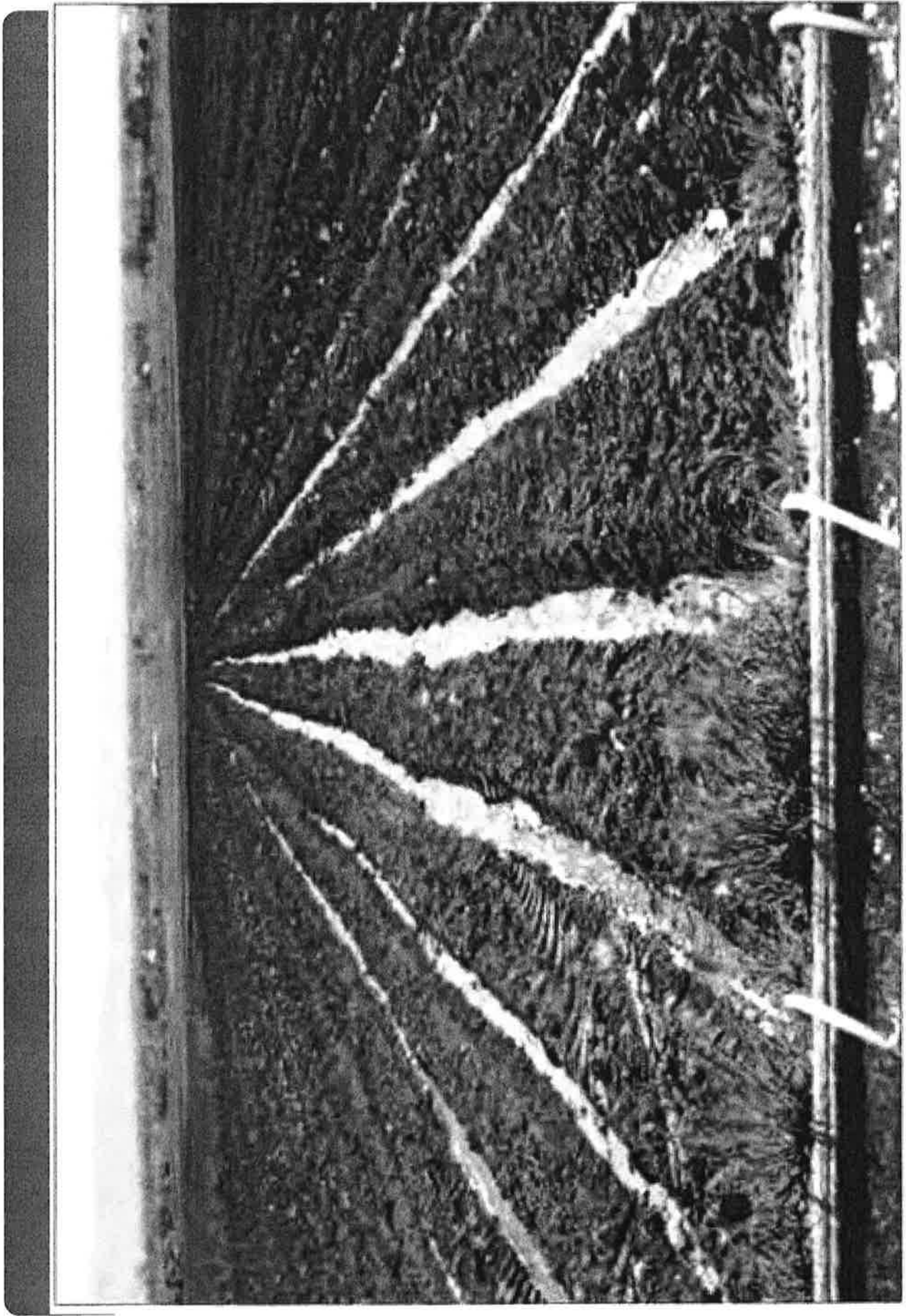
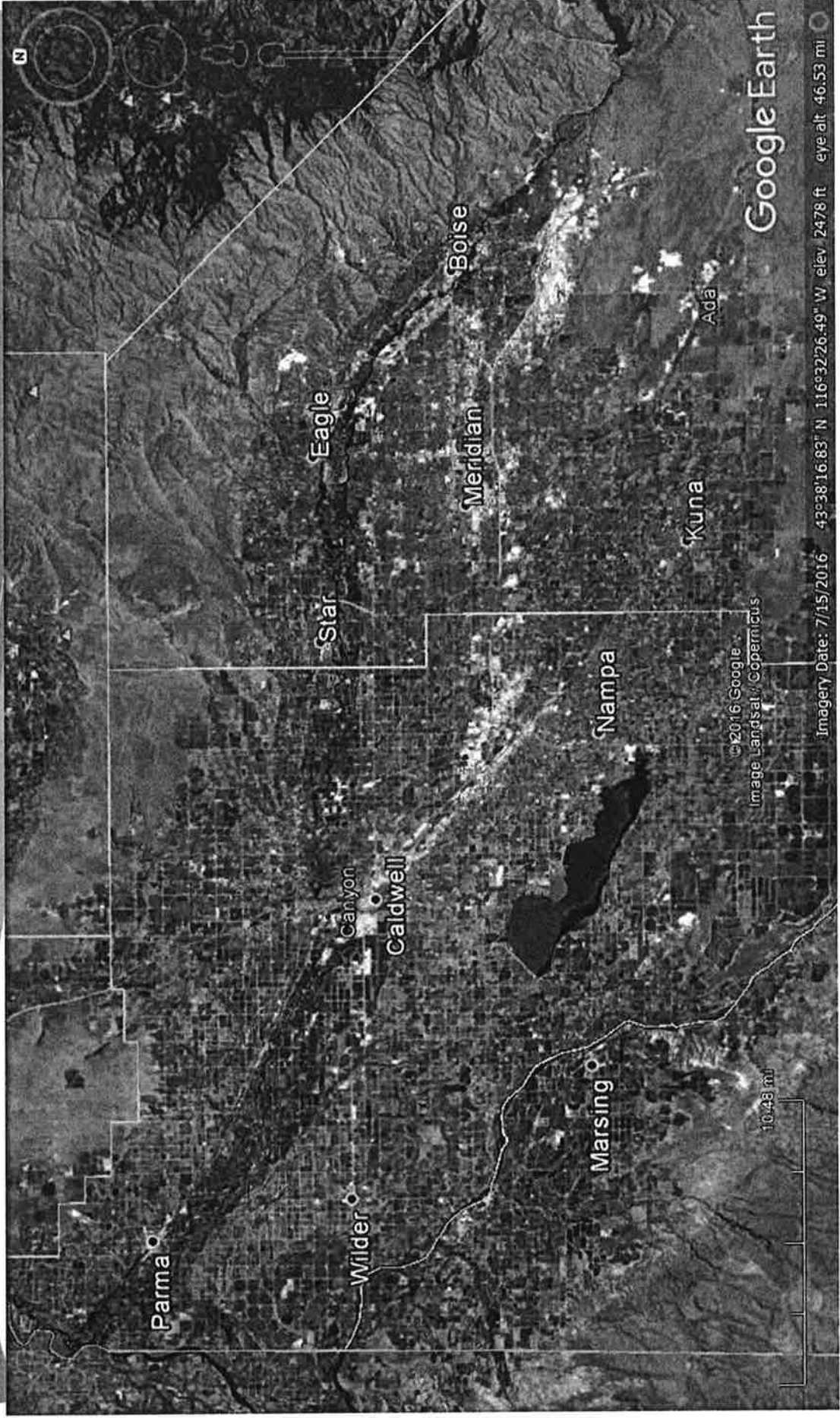


Treasure Valley Agriculture Water Quality Challenges

Daniel Steenson
Sawtooth Law, PLLC
January, 2017





Parma

Wilder

Marsing

Caldwell

Nampa

Star

Eagle

Meridian

Boise

Kuna

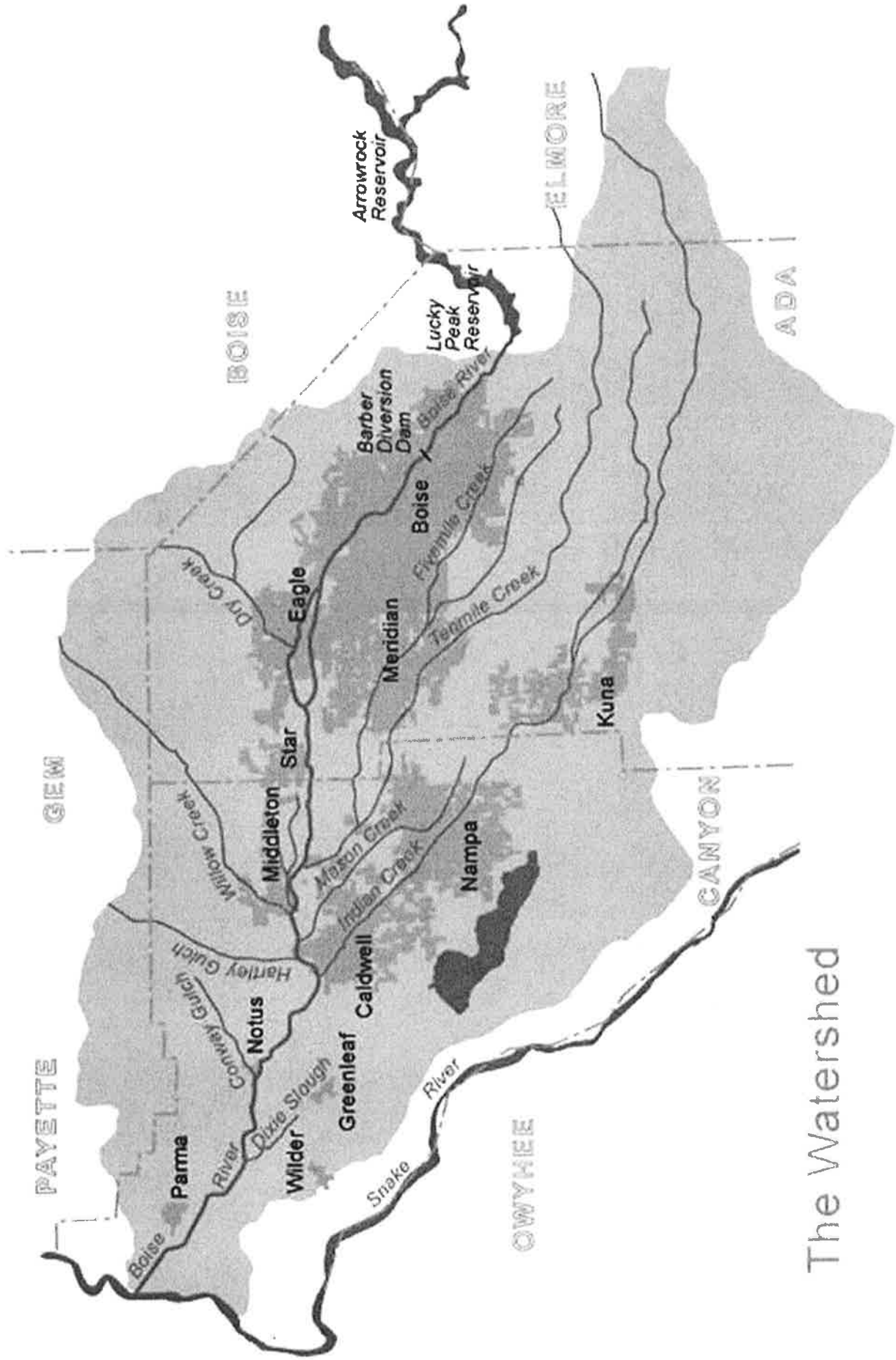
Ada

Google Earth

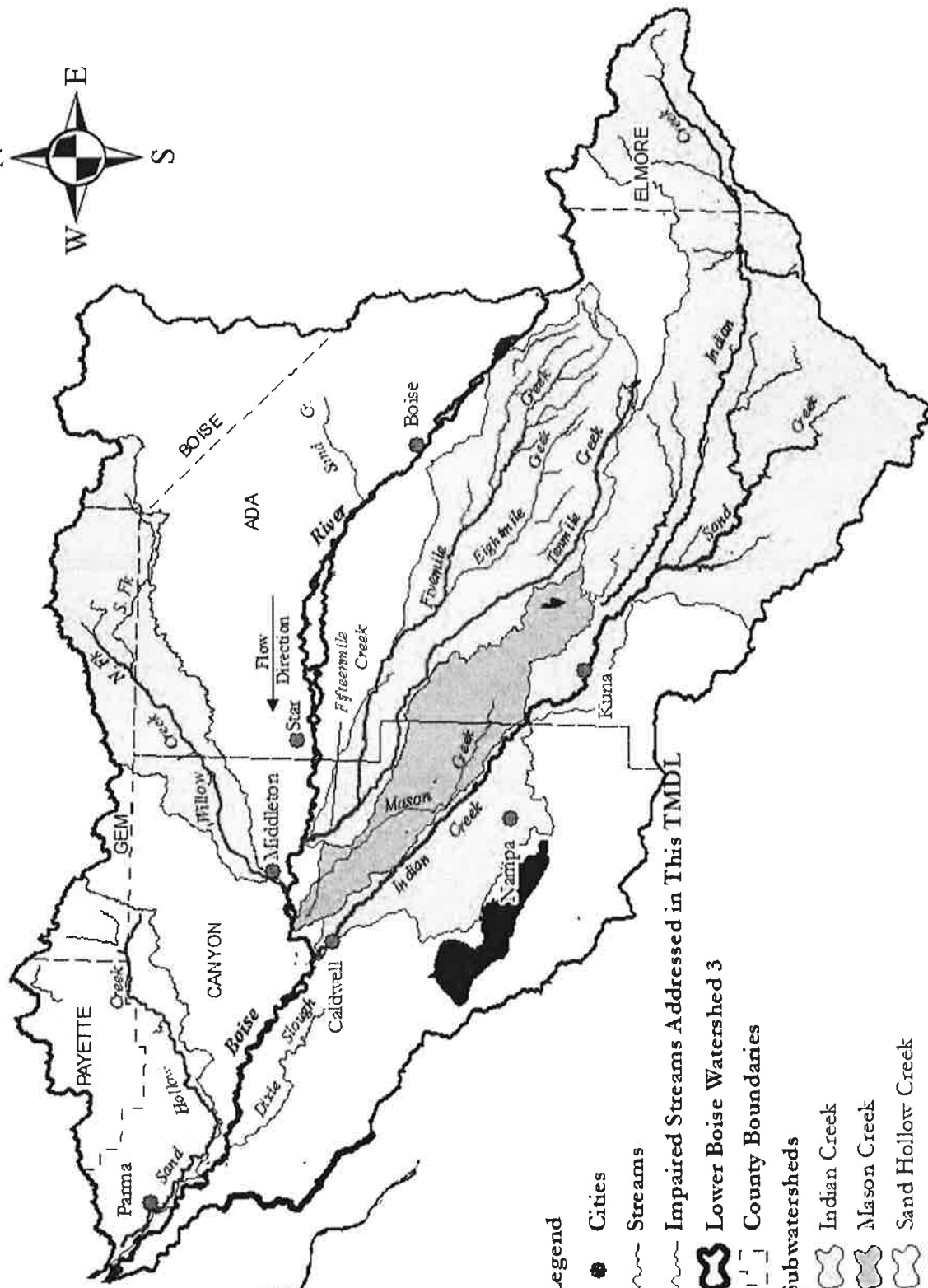
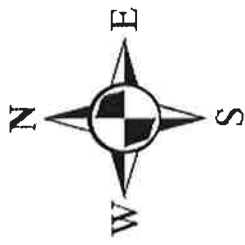
© 2016 Google
Image Landsat/Copernicus

Imagery Date: 7/15/2016 43°38'16.83" N 116°32'26.49" W elev. 2478 ft eye alt. 46.53 mi

10.43 mi

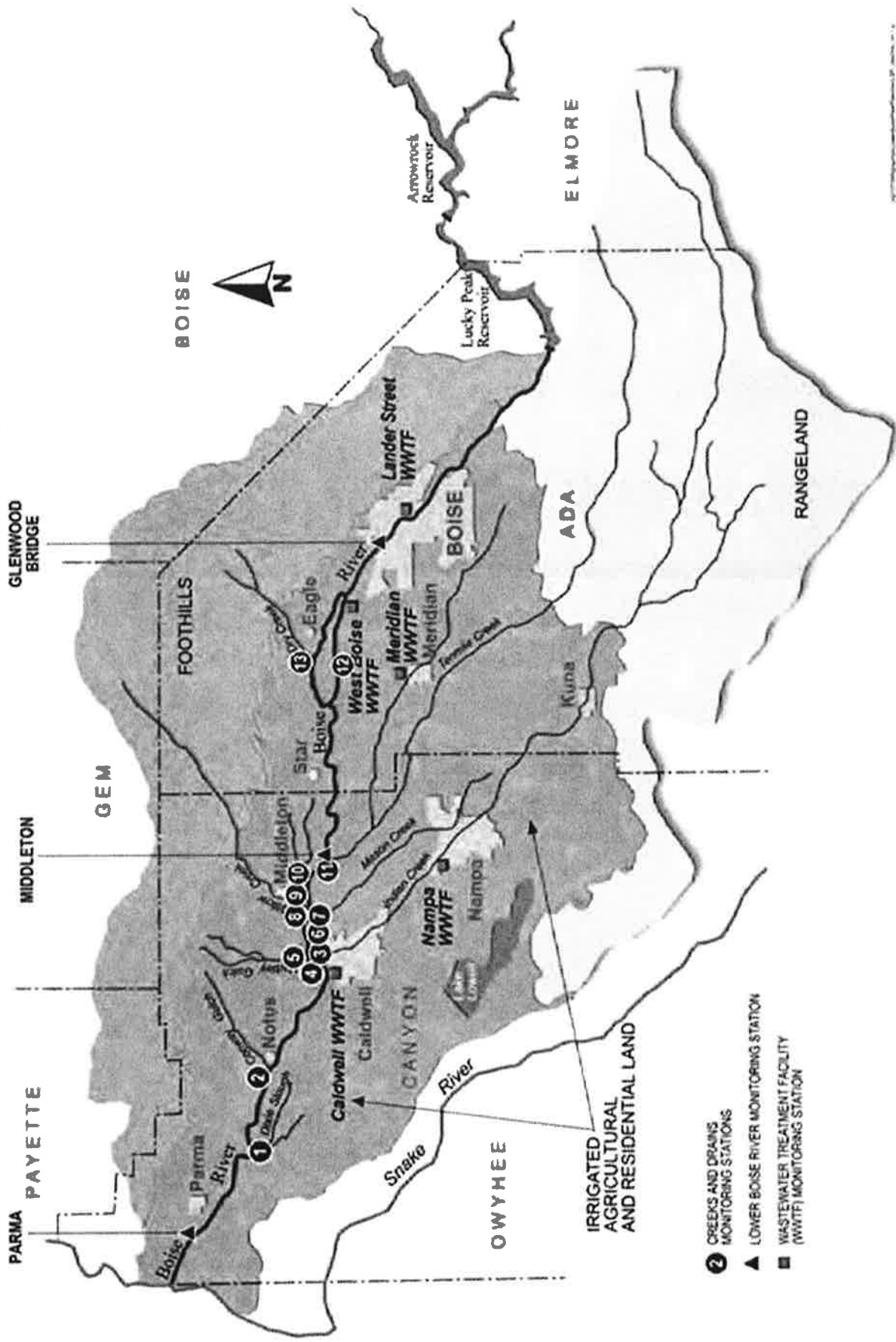


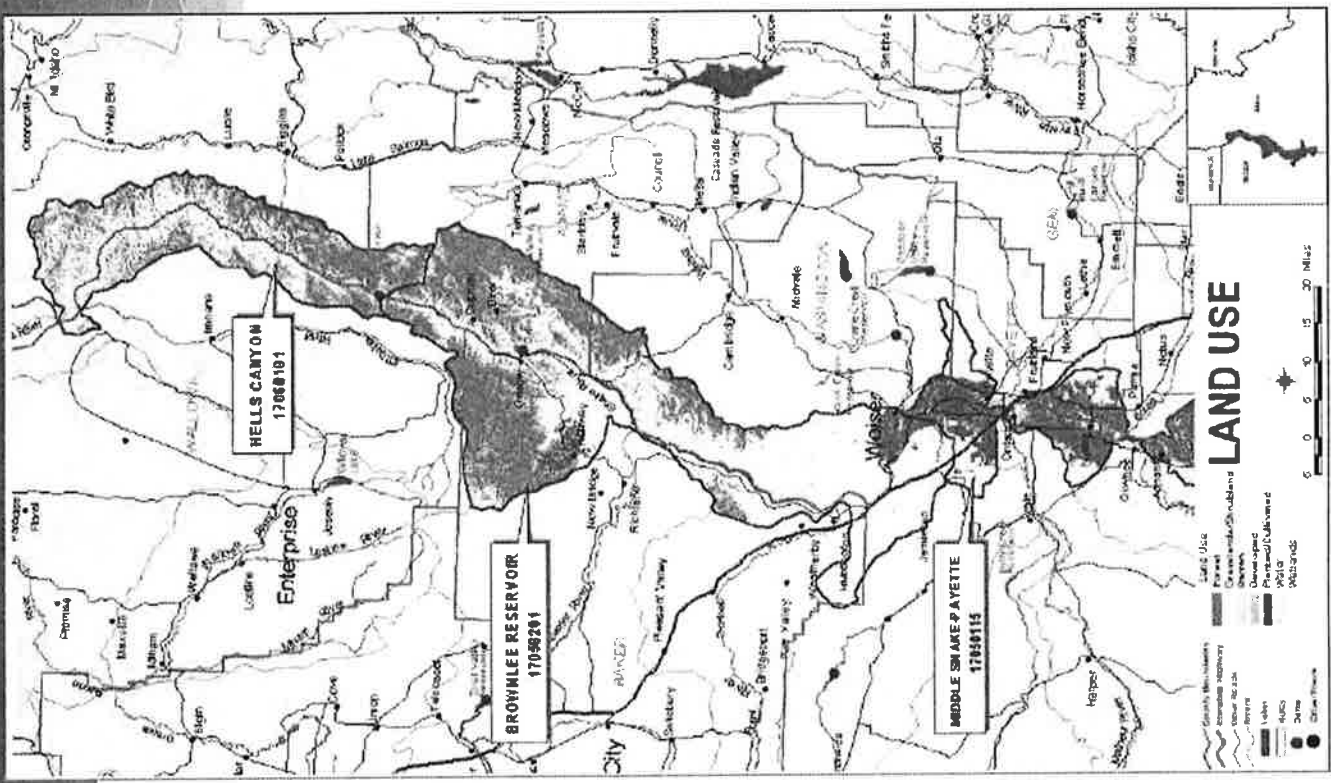
The Watershed



Legend

- Cities
- ~ Streams
- Impaired Streams Addressed in This TMDL
- Lower Boise Watershed 3
- County Boundaries
- Subwatersheds
- Indian Creek
- Mason Creek
- Sand Hollow Creek
- 5-10-15 Mile Creeks
- Willow Creek







Survey of Treasure Valley Agricultural land hydrologically connected to Boise River and its tributaries:

all irrigated fields: 144,561.22 acres

flood irrigated fields: **109,526.61 acres**

pressure irrigated fields: 35,034.61 acres



Google Earth

© 2016 Google
Image Landsat/Copernicus

Imagery Date: 7/15/2016 43°38'16.83" N 116°32'26.49" W elev. 2478 ft eye alt. 46.53 mi

10.48 mi

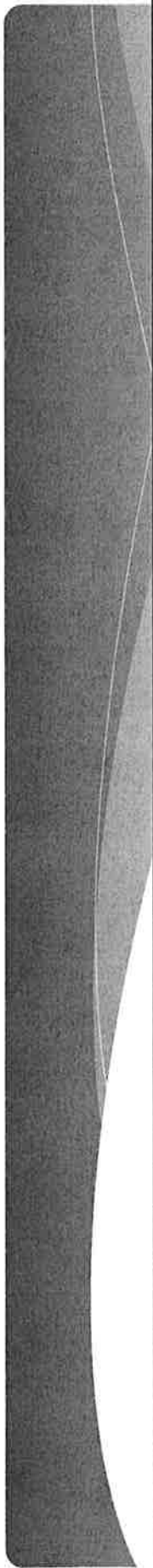
Boise River



Google Earth

Imagery Date: 4/1/2016 43°44'06.51" N 116°48'39.46" W elev: 2325 ft eye alt: 20.89 mi

4.72 mi



Imagery Date: 4/1/2016 43°42'23.38" N 116°47'13.06" W elev-2504 ft eye alt -35031 ft

Google Earth

1992

7487 ft

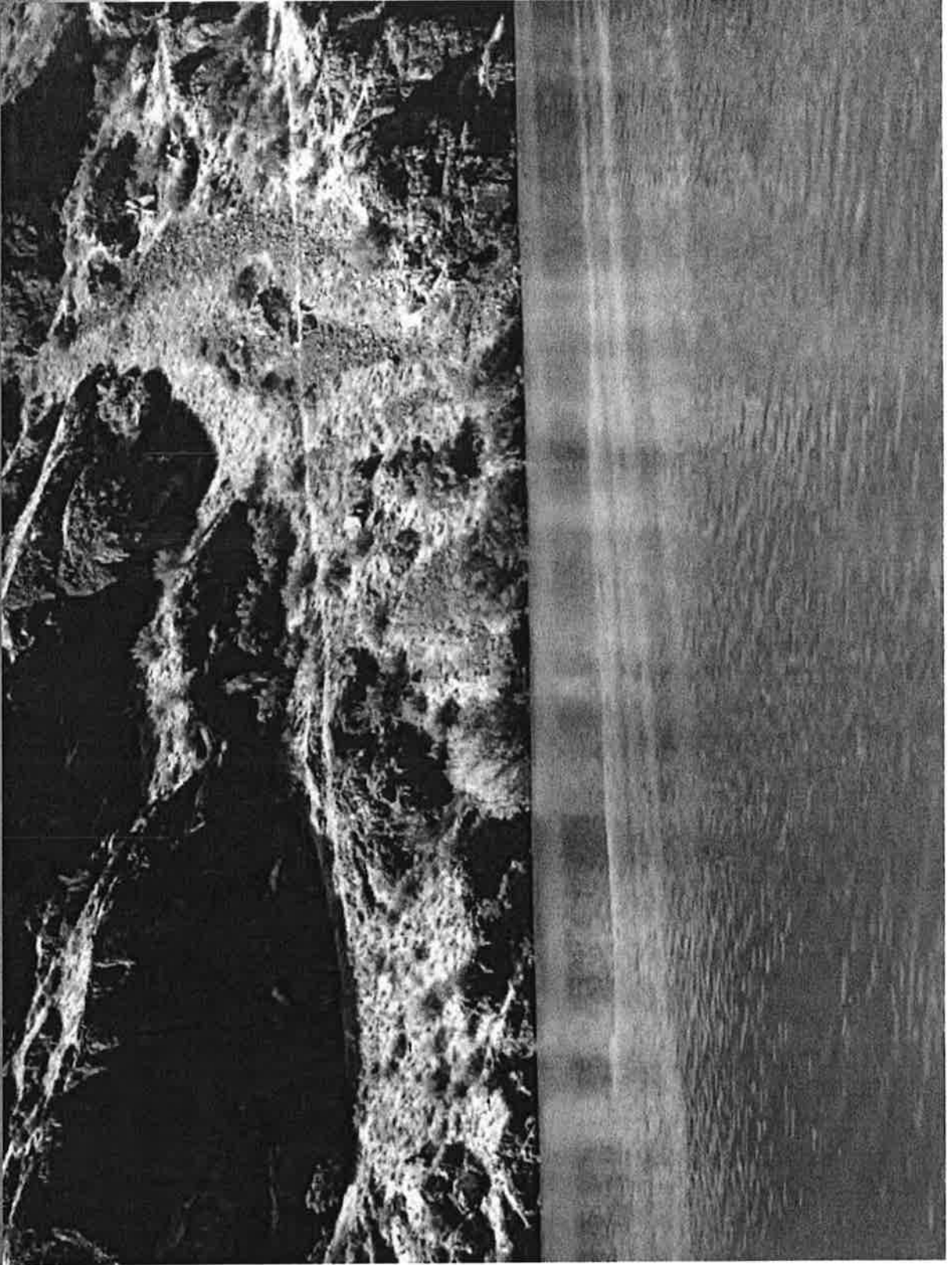


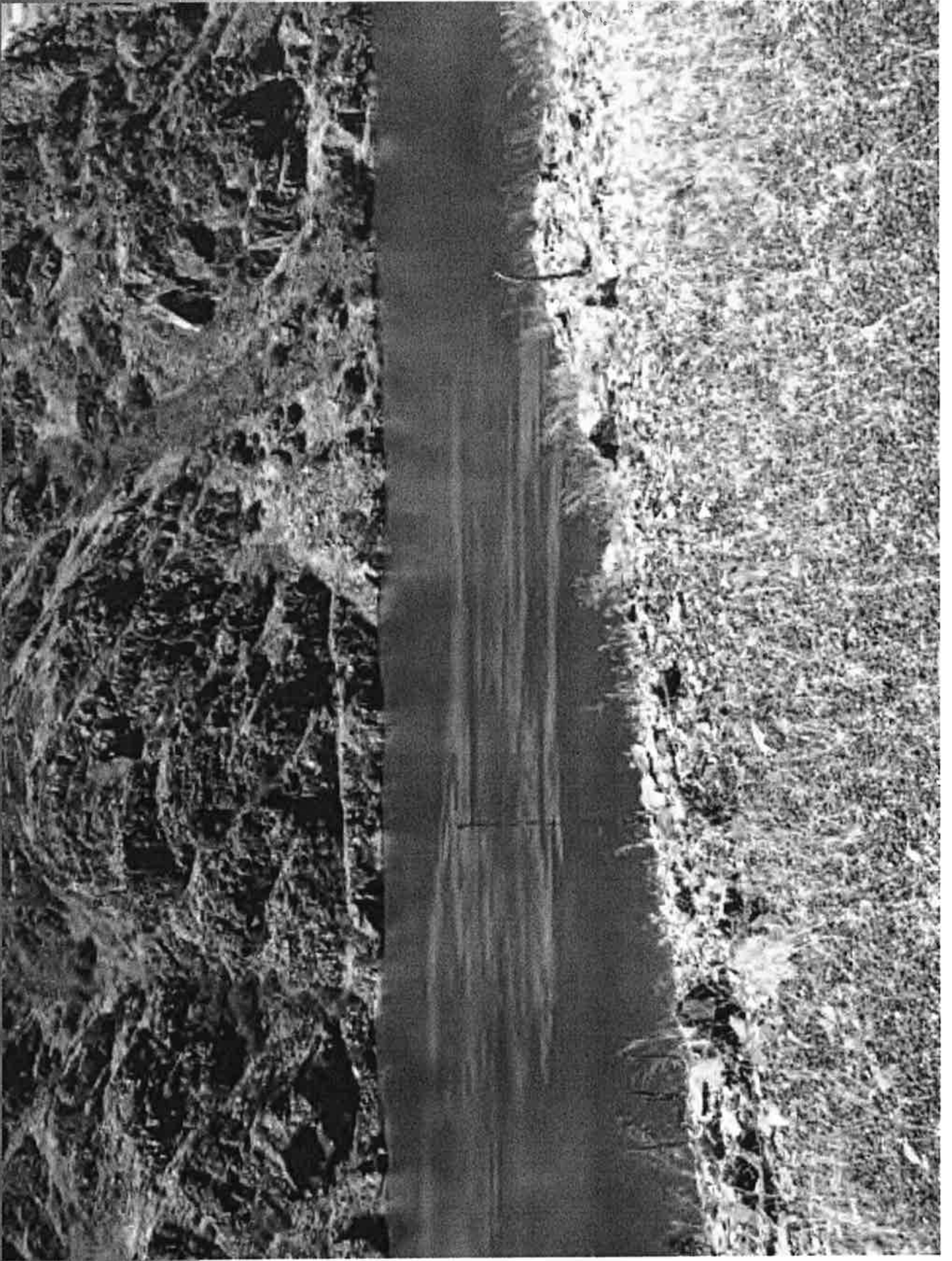
02. **Cold Water.** Waters designated for cold water aquatic life are not to vary from the following characteristics due to human activities:

b. **Water temperatures** of twenty-two (22) degrees C [71.6 degrees F] or less with a maximum daily average of no greater than nineteen (19) degrees C [66.2 degrees F].

05. **Modified.** Water quality criteria for modified aquatic life will be determined on a case-by-case basis reflecting the chemical, physical, and biological levels necessary to attain the existing aquatic life community. These criteria, when determined, will be adopted into these rules.











1594

4/2016
2016

Boise River

1182 ft

1984

Imagery Date: 4/1/2016 43°49'05.16" N 117°01'18.10" W elev 2185 ft eye alt 7331 ft

Google Earth



sediment plume



Sand Hollow Creek

© 2008 Tele Atlas
Image © 2008 DigitalGlobe
© 2008 Europa Technologies

Google™

Eye alt 944 ft

Streaming 100%

Pointer 11 T 498621.58 m E 4852734.02 m N

273 ft



Boise River

↑ effluent plume

Indian Creek



Google™

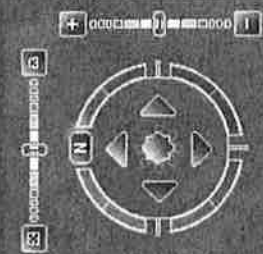
© 2008 Tele Atlas

Image © 2008 DigitalGlobe
Streaming 100%

262 ft

Pointer 11 T 523657.58 m E 4836127.39 m N

Eye alt 908 ft



Conway Gulch

sediment plume

Boise River

© 2008 Tele Atlas
Image © 2008 DigitalGlobe

© 2007 Google™

Pointer 11 T 514274.85 m E 4841473.74 m N
305 ft

Streaming 100%

Eye alt 1054 ft



Boise River

sediment plume

Fifteenmile Creek

sediment plume

© 2008 Terra Atlas
Image © 2008 DigitalGlobe

Google™

Eye alt 1039 ft

Streaming 100%

Pointer 11.T 532902.59 m E 4837238.30 m N

300 ft



2008 DEQ proposed to delist the Lower Boise River for nutrients due to lack of evidence of impairment:

- dissolved oxygen (DO) and pH data (aquatic life use)
- planktonic chlorophyll-a data (aquatic life, recreational use)
- lack of complaints on nuisance algae from 1997-2000 (recreation)
- velocity of the river higher than scouring thresholds (recreation)

2009 EPA concluded that IDEQ did not demonstrate good cause to delist the Lower Boise River for nutrients:

Total phosphorus, **periphytic chlorophyll-a** and macroinvertebrate data clearly indicate that the Lower Boise River is impaired for nutrients.

2015 LBR phosphorus TMDL addendum



numeric target to describe nuisance aquatic growth that may impair the lower Boise River: mean monthly benthic (periphyton) chlorophyll $a \leq 150$ mg/m².

based largely on work conducted in Montana, where 70% of the public identified this level as acceptable for recreation during the growing season from July 1–September 30 (Suplee et al. 2008, 2009).

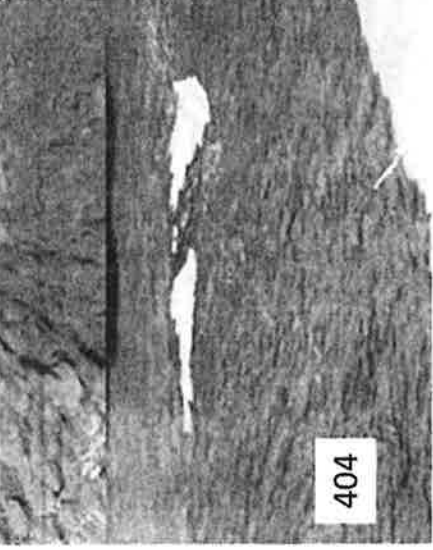
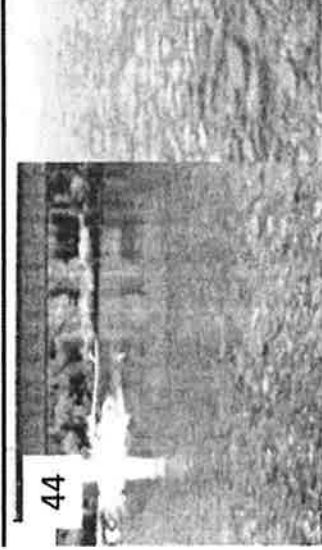
In contrast, less than 30% of the public identified periphyton of >200 mg/m² as acceptable for recreation.

The target is similar to other locations, including Minnesota, Colorado, and the Clark Fork River, for which the maximum summer periphyton target is ≤ 150 mg/m²



Periphyton is a complex mixture of algae, cyanobacteria, heterotrophic microbes, and detritus that is attached to submerged surfaces in most aquatic ecosystems.





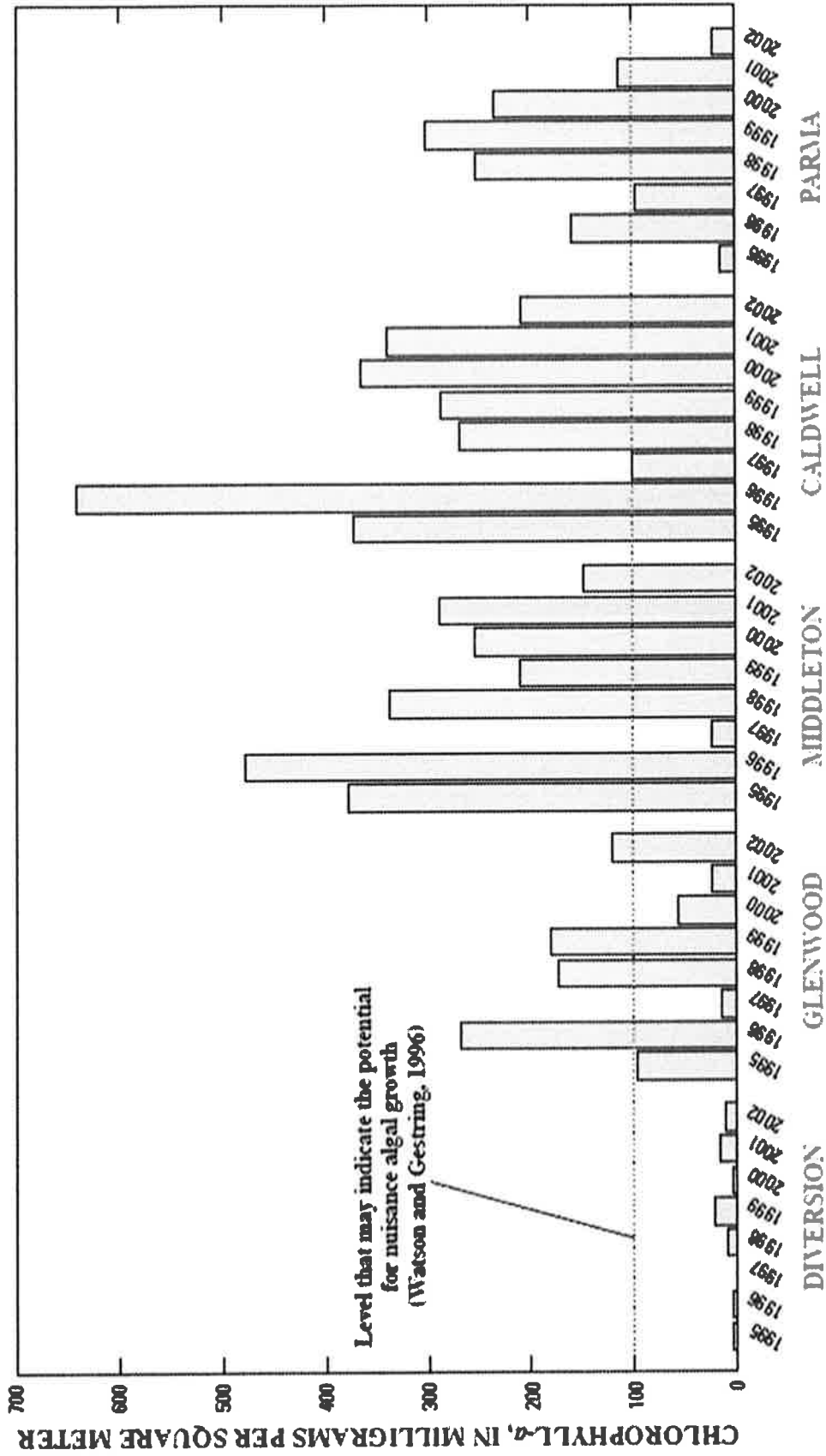
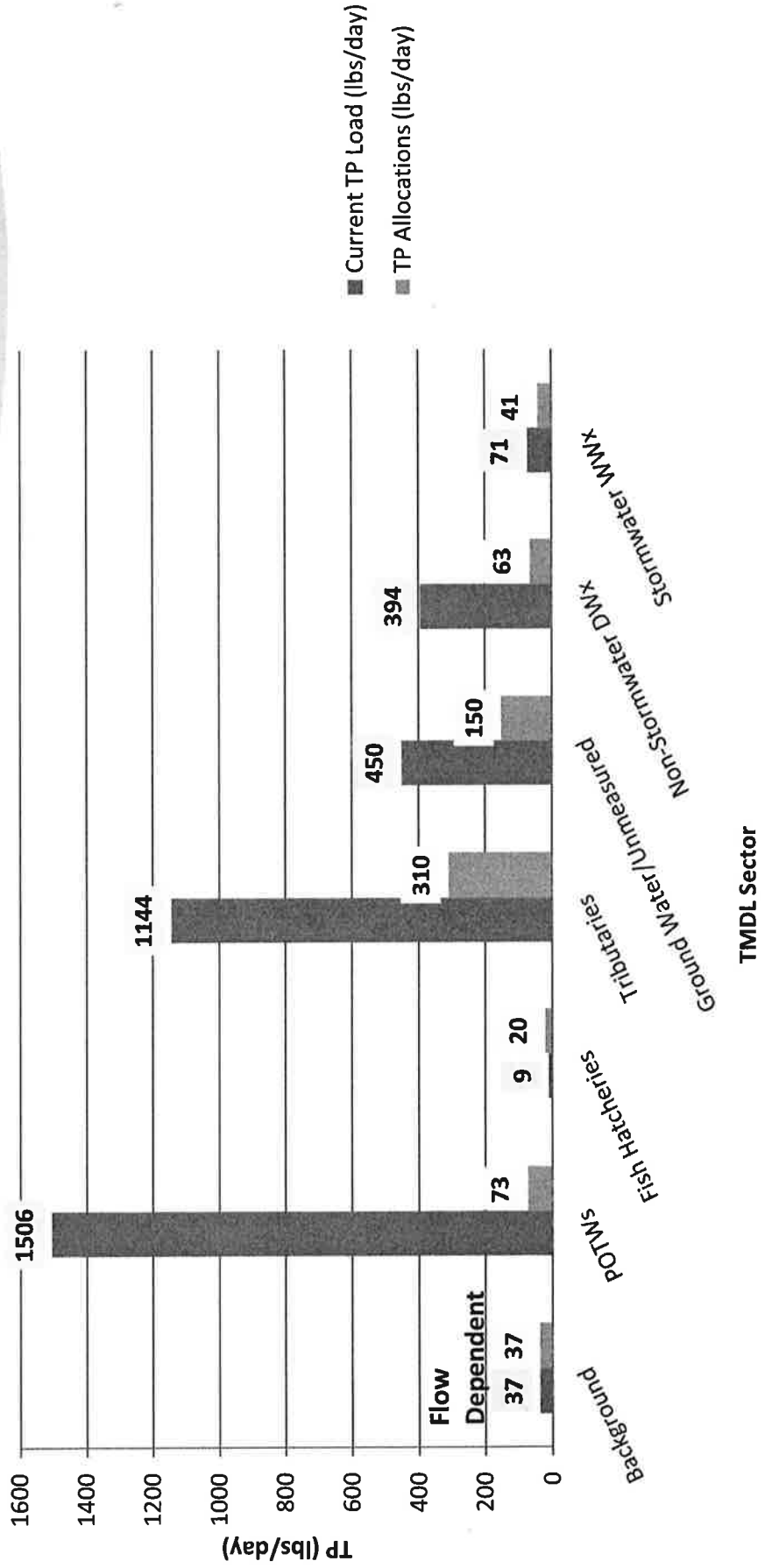


Figure 24. Peniphyton chlorophyll-a concentration at selected biological sampling sites on the lower Boise River, Idaho, 1995-2002.

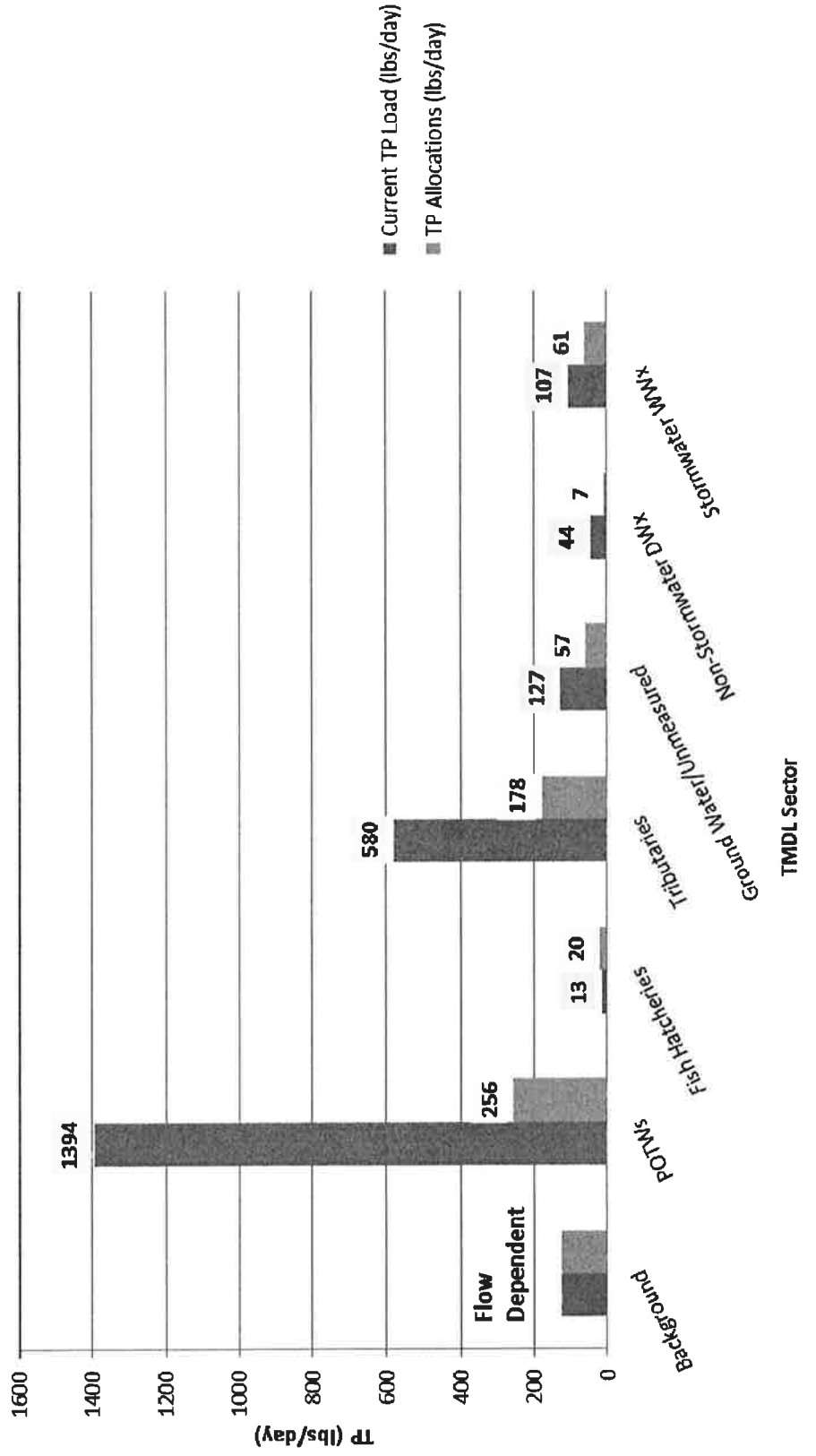
NEED: TMDL TP Allocations May 1 – Sept 30



NEED: TMDL TP Allocations Oct 1 – April 30

Sector	Current TP		Target TP		TP Allocation		Percent Reduction
	Conc. (mg/L)	Load (lb/day)	Conc. (mg/L)	TP	(lb/day as a monthly average)	Flow	
Average Daily Background	0.018	Flow dependent	0.018	Flow dependent	Flow dependent	Flow dependent	0%
Average NPDES POTW and Industry	3.32	1,394	0.35	256			-82%
Average Tributary (w/o NPDES Flows and Loads)	0.22	580	0.07	178			-69%
Average Ground Water and Unmeasured	0.15	127	0.07	57			-55%
Average Nonstormwater Dry Weather	n/a	44	n/a	n/a			-84%
Average Stormwater Wet Weather	n/a	107	n/a	n/a			-43%

NEED: TMDL TP Allocations Oct 1 – April 30



NEED: Reductions to meet TMDL TP

Tributary	Current TP Load (lb/day)*	Current TP Load (lb/season)	Average TP Allocation (lb/day)**	Average TP Allocation (lb/season)	Needed TP Load Reduction (lb/season)
Mason Creek	322.1	48,959	56.1	8,527	40,432
All Tributaries	1,664.4	252,989	356.7	54,218	198,770

NEED: Implementation Plans & Reasonable Assurance

- * Updating Implementation Plans
 - * Required to show TMDL goals will be achieved
 - * Time frame
 - * Monitoring
- * **Demonstrate TMDL not necessary for TP listed tributaries**
- * Reasonable Assurance
 - * TMDL goals will be achieved
 - * w/in acceptable time frame
 - * LBR TMDLs rely substantially on nonpoint source reductions

How Ag. Lands contribute Sediment & Phosphorus to the Boise River

- * Surface return flows to drains
- * Seepage to groundwater – 500,000 AF annually
- * Total phosphorus
 - * Phosphorus attached to sediment in surface return flows
 - * Dissolved phosphorus
 - * In return flows
 - * In seepage to groundwater

Meeting Boise River TMDL Goals Will Require Continued & Increased Funding

- * Historically available funding is inadequate to meet Boise River and SR-HC TMDL goals
- * Funding is primary factor in BMP implementation rate, time frame & interim goals
- * Ag. acres to be treated
- * BMP costs per acre
 - * low - \$500 (updated)
 - * med. - \$1,500 (updated)
 - * high - \$2,000 (updated)



flood irrigated fields: 109,526.61 acres
70%-80% reduction in TP

BMP treatment for all acres:

@ \$1,500 per acre = \$164,290,000

@ \$2,000 per acre = \$219,053,220

BMP treatment for 80% of acres

@ \$1,500 per acre = \$131,431,932

@ \$2,000 per acre = \$175,242,576



Ada County:

Total farm production expenses (\$1,000) 207,309
Average per farm (\$) 168,134

Net cash farm income of operation (\$1,000) 19,646
Average per farm (\$) 15,934

Canyon County:

Total farm production expenses (\$1,000) 439,846
Average per farm (\$) 188,694

Net cash farm income of operation (\$1,000) 93,740
Average per farm (\$) 40,215



Estimated municipal costs to meeting TP allocation numbers:

Total: 428 to 514 million.

Boise:	98 to 127 million
Caldwell:	16 million
Greenleaf:	6.1 to 10 million
Kuna:	26 million
Meridian:	82 - 85 million
Nampa:	200 - 250 million (includes O&M)

Not all cost estimates include annual O&M, which can be substantial. For example Boise O&M costs are 3.8 million.

Does not include stormwater treatment costs (e.g. highway districts)

Complex Challenges Require Diverse and innovative Solutions

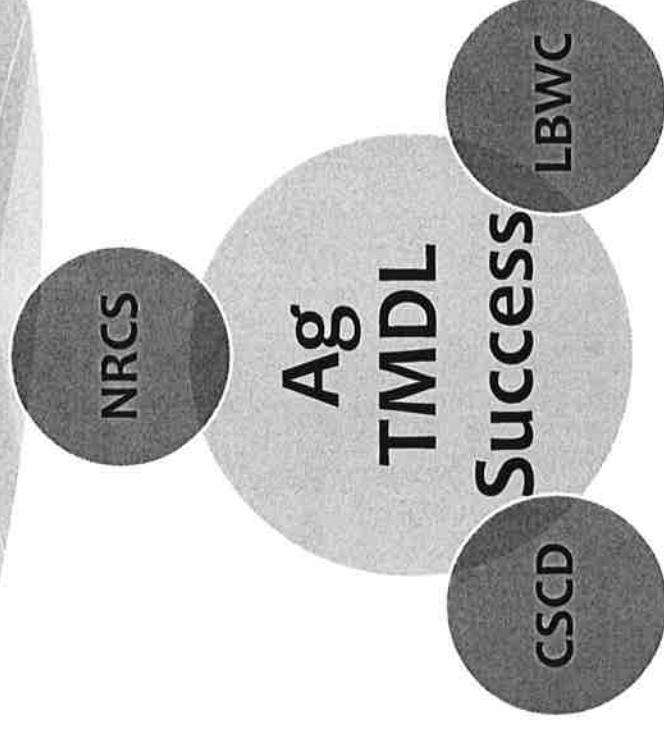
- * Treasure Valley's unique, diverse & complex WQ challenges
 - * hydrology
 - * land use
 - * economy
 - * growth
 - * coordination
 - * education

Continuing A Successful Program

- The Lower Boise WAG has received three 319 grants in 2009, 2011, and the most recent in 2014
- 2009 and 2011 grants are complete
- Currently executing 2014 grant
- Accomplishments (to date):
 - * Establishment of strong local partnerships
 - * Expanded public outreach
 - * Implementation of projects that improve water quality in the Lower Boise River and provide BMP demonstration for enhanced water quality

Accomplishments – Strong Local Partnerships

- Success of projects because of the following partnerships:
 - * Administrative: Lower Boise Watershed Council (LBWC) and Canyon Soil Conservation District (CSCD)
 - * Technical: Canyon Soil Conservation District, and Natural Resources Conservation Service (NRCS)



NEED: Boise River Stakeholders Face Multiple Water Quality Challenges

- * Boise River listed Waterbodies and TMDLs
 - * SR-HC TP TMDL
 - * Boise River TP TMDL
 - * Boise River Sediment & Bacteria TMDLs
 - * Tributary Sediment & Bacteria TMDLs
 - * Lake Lowell TMDL
- * TP listed tributaries – can another TMDL be avoided?
- * Temperature



08. **Sediment.** Sediment shall not exceed quantities ... which impair designated beneficial uses. Determinations of impairment shall be based on water quality monitoring and surveillance and the information utilized as described in Section 350.

05. **Floating, Suspended or Submerged Matter.** Surface waters of the state shall be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses. This matter does not include suspended sediment produced as a result of nonpoint source activities.



06. **Excess Nutrients.** Surface waters of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses.

68. **Nutrients.** The major substances necessary for the growth and reproduction of aquatic plant life, consisting of nitrogen, phosphorus, and carbon compounds.

67. **Nuisance.** Anything which is injurious to the public health or an obstruction to the free use, in the customary manner, of any waters of the state. (7-1-93)

NEED: TMDL TP Allocations May 1 – Sept 30

Sector	Current TP Conc. (mg/L)	Current TP Load (lb/day)	Target TP Conc. (mg/L)	TP Allocation (lb/day as a monthly average)	Percent Reduction
Average Daily Background	0.018	37	0.018	37	0%
Average Daily NPDES POTW and Industry	3.27	1,506	0.1	73	-95%
Average Tributary (w/o NPDES Flows and Loads)	0.25	1,144	0.07	310	-73%
Average Ground Water and Unmeasured	0.21	450	0.07	150	-67%
Average Nonstormwater Dry Weather	0.44	394	n/a	n/a	-84%
Average Stormwater Wet Weather	n/a	71	n/a	n/a	-42%