

Russian River Pathogen Indicator Bacteria TMDL

Of Recreation & Water Quality

The quality of all the waters of the state shall be protected for use and enjoyment by the people of the state. California Water Code §13000

Beneficial Uses of the Russian River

Key Beneficial Uses that are Impacted by Pathogens

REC-1	Water Contact Recreation
REC-2	Non-Contact Water Recreation

Water quality objectives are the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area. California Water Code §13050(h)

Bacteria Water Quality Objective

The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.



Contact Information

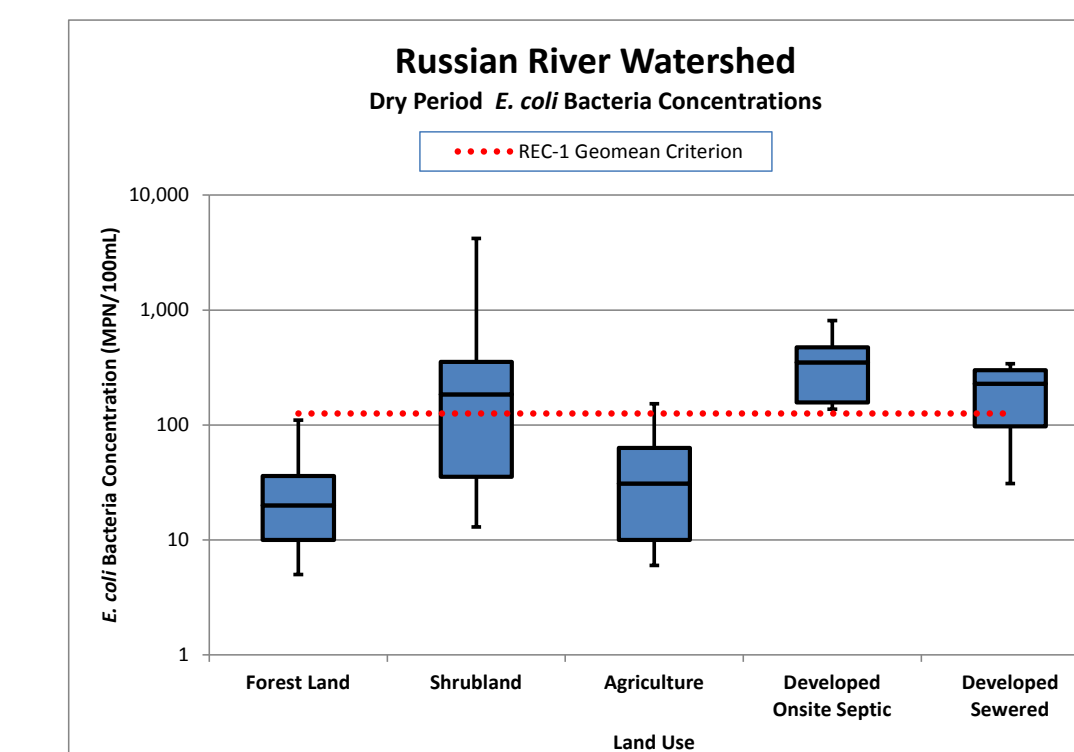
Webpage:
http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdl/russian_river/

Mailing List:
http://www.waterboards.ca.gov/resources/email_subscription/subscribe.shtml

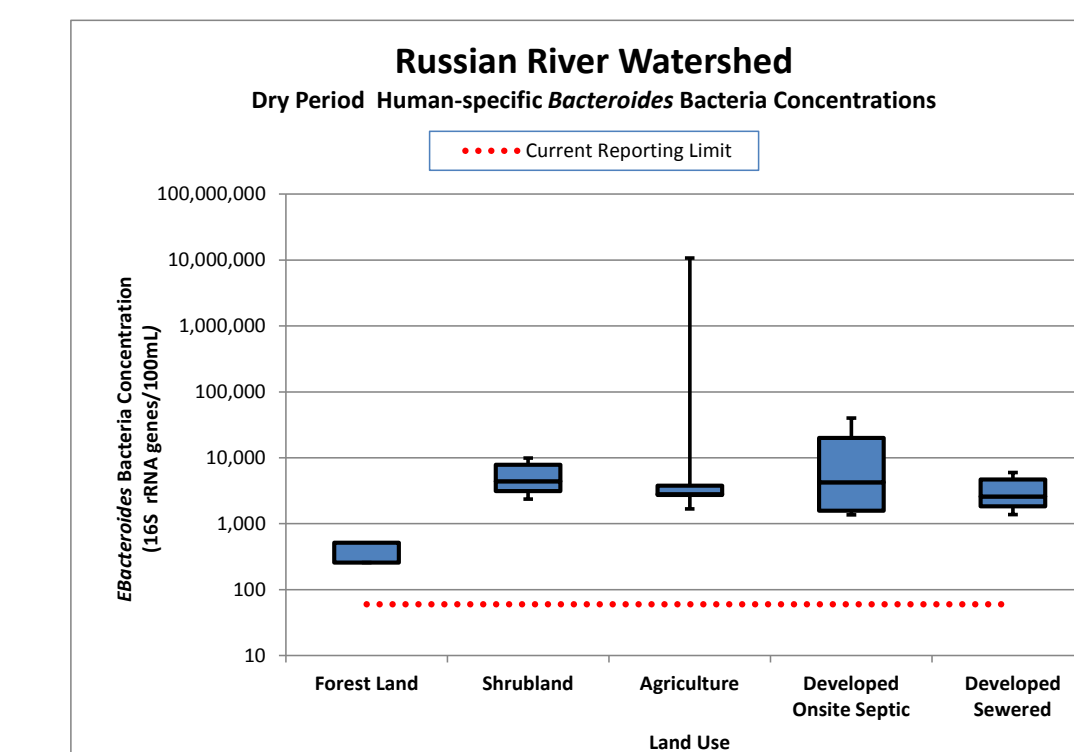
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(707) 576-2220

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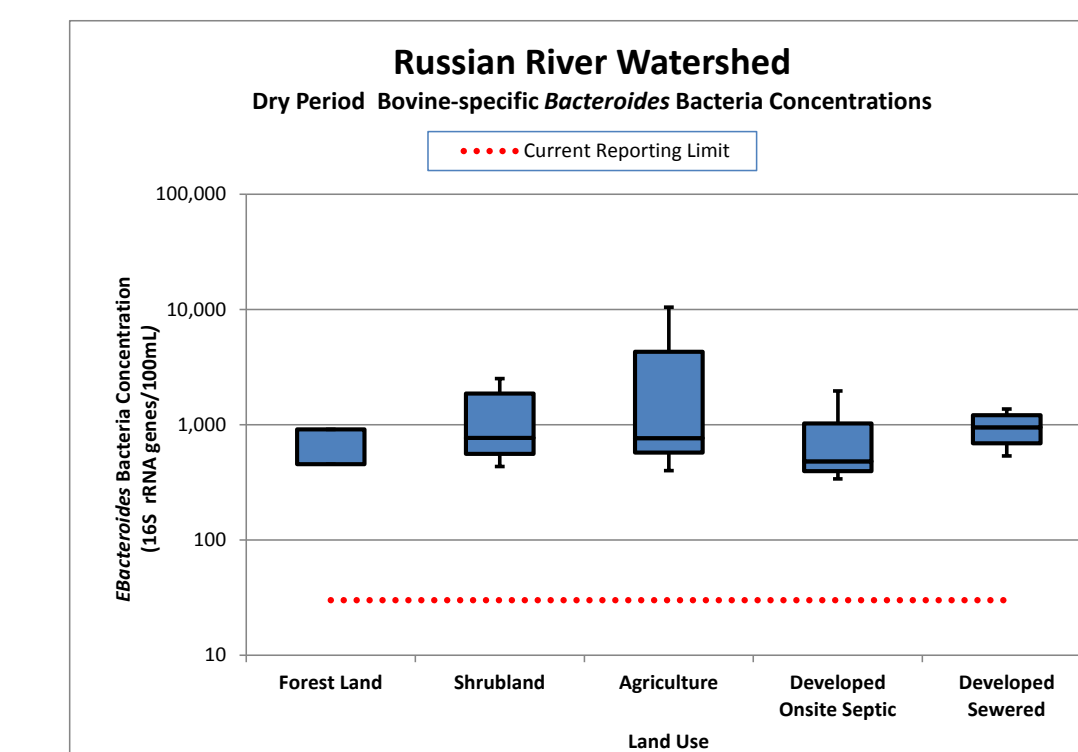
Sources



E. coli Bacteria Concentrations Measured in the Russian River Watershed during Dry Periods by Land Cover Category.

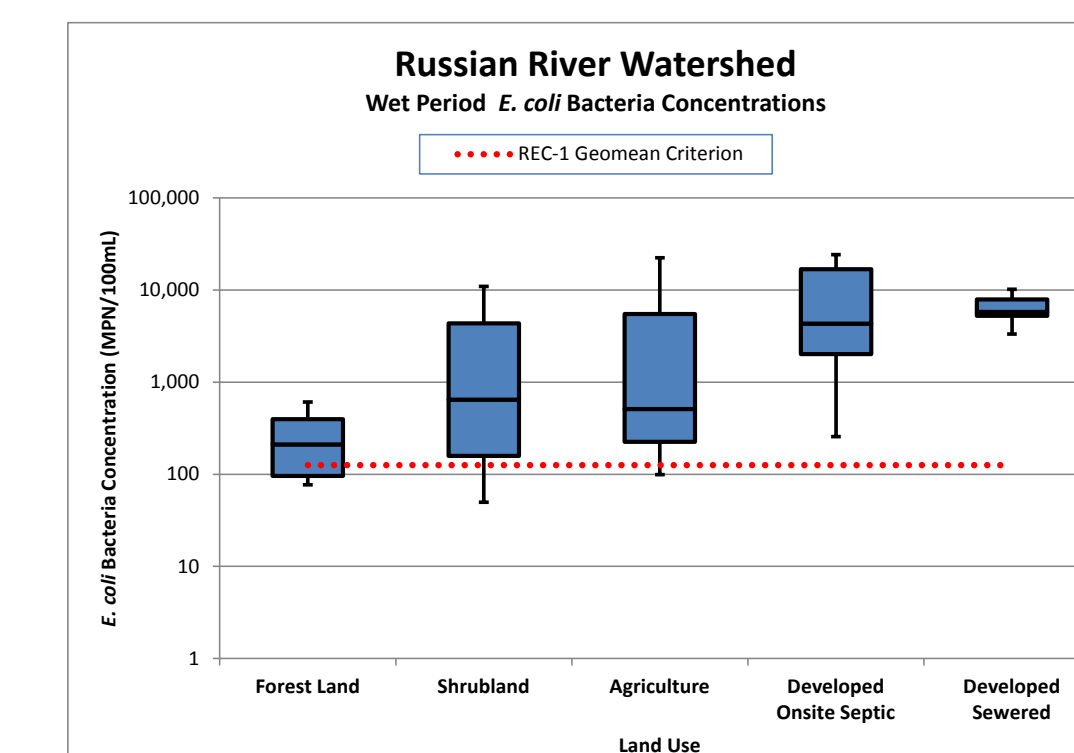


Human-specific Bacteroides Bacteria Concentrations Measured in the Russian River Watershed during Dry Periods by Land Cover Category.

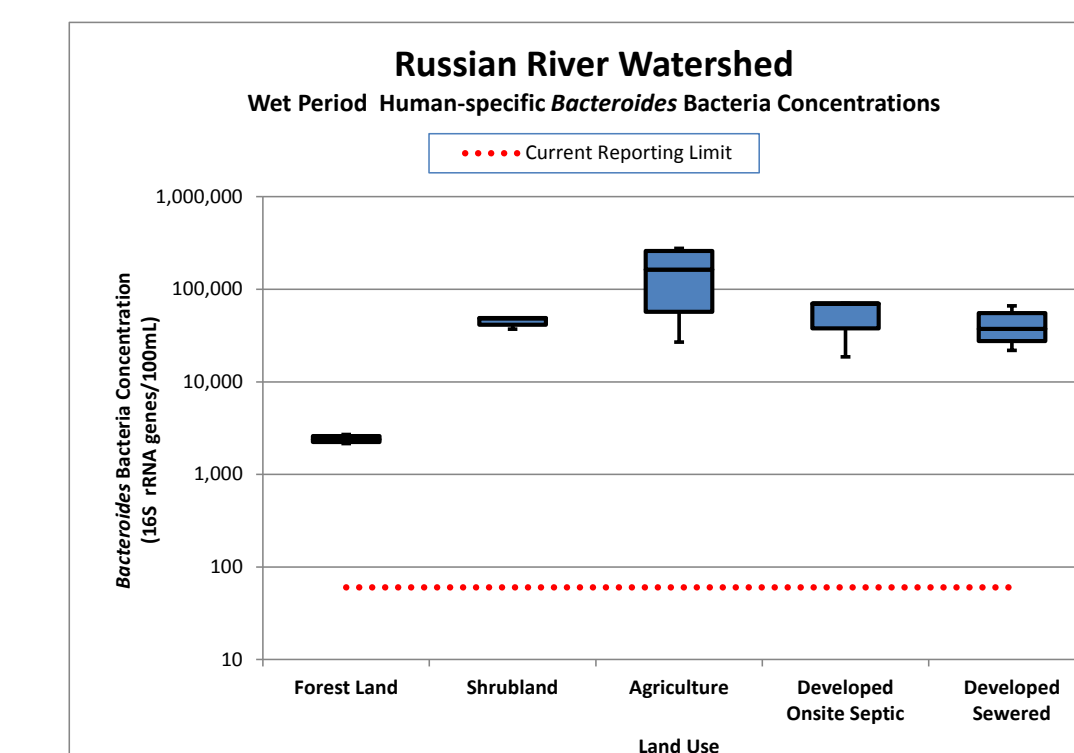


Bovine-specific Bacteroides Bacteria Concentrations Measured in the Russian River Watershed during Dry Periods by Land Cover Category.

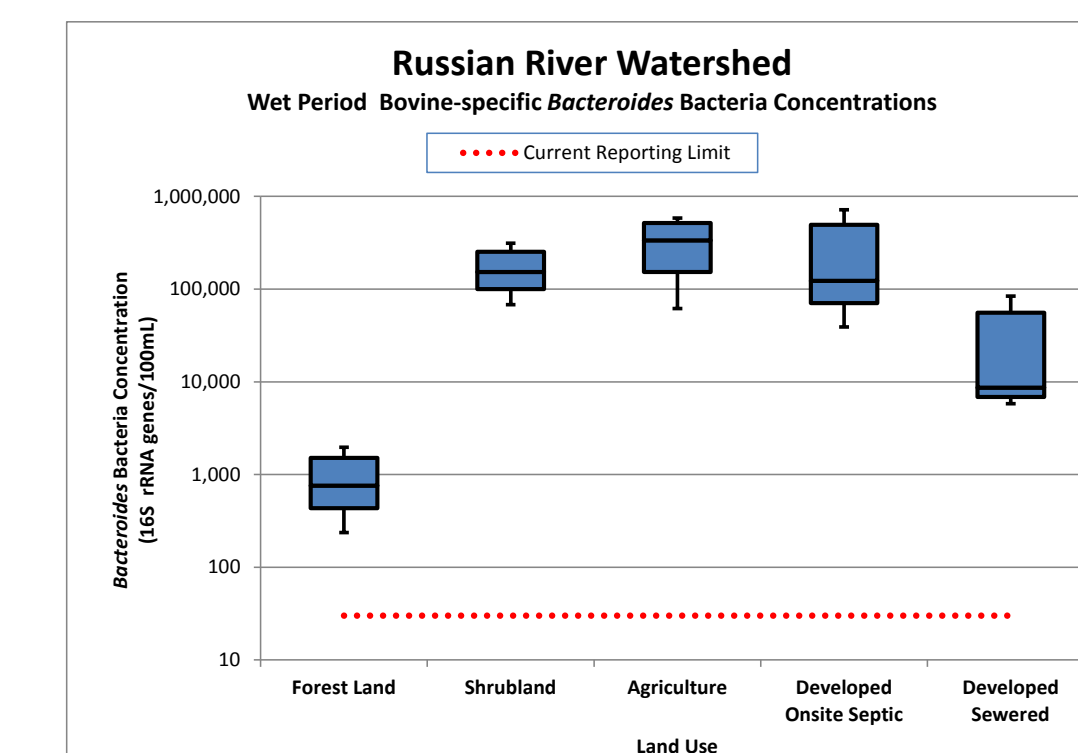
- #### Sources of Bacteria & Pathogens
- Sources are producing bacteria throughout the year
 - Stormwater runoff is mobilizing the bacteria into waterbodies
 - Bacteria levels are higher in developed areas than in less developed areas
 - Bacteria levels are higher in runoff from catchments with a high density of onsite wastewater treatment systems than from areas with a low density of systems
 - High recreational uses can result in high bacteria levels



E. coli Bacteria Concentrations Measured in the Russian River Watershed during Wet Periods by Land Cover Category.



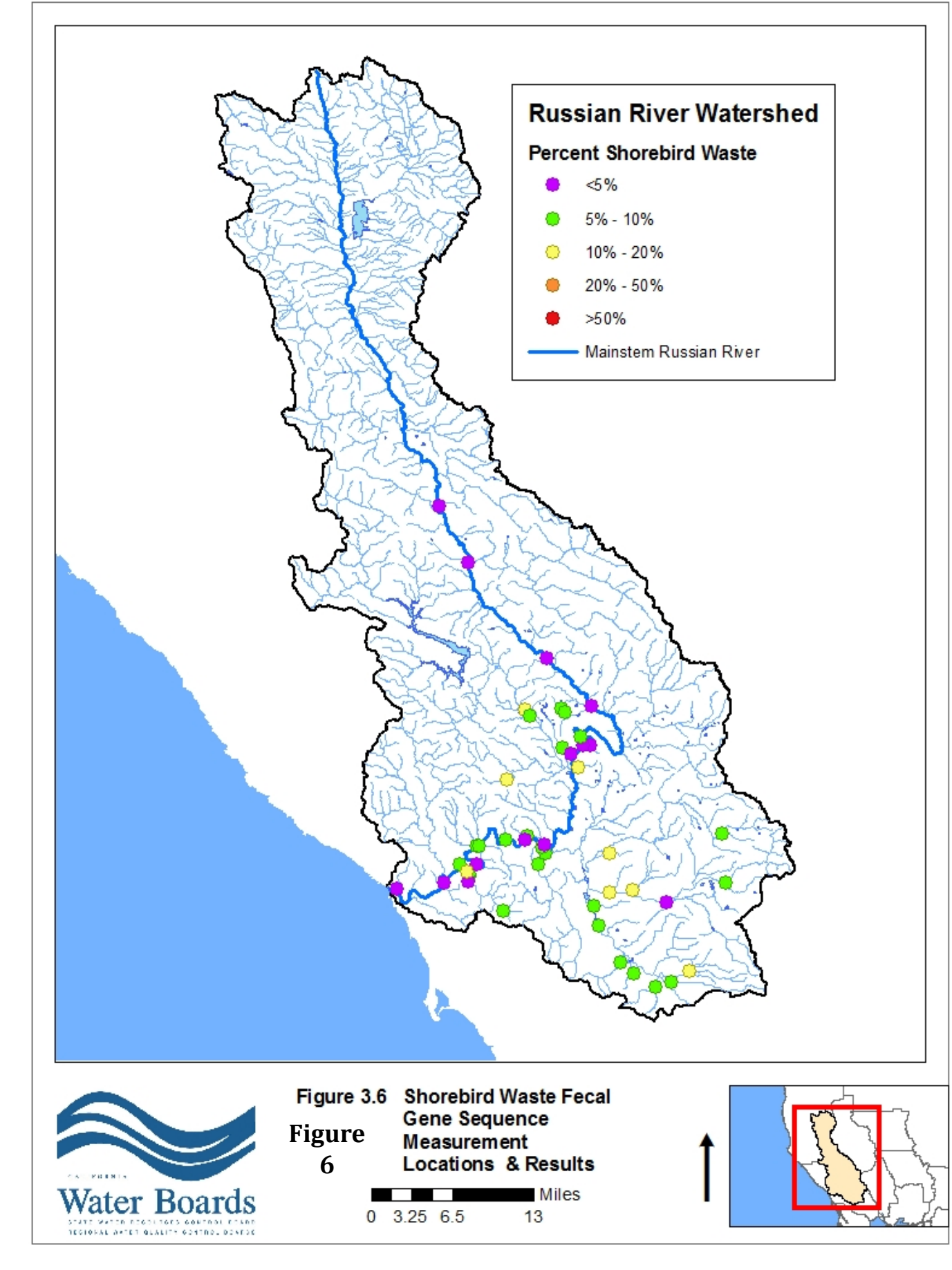
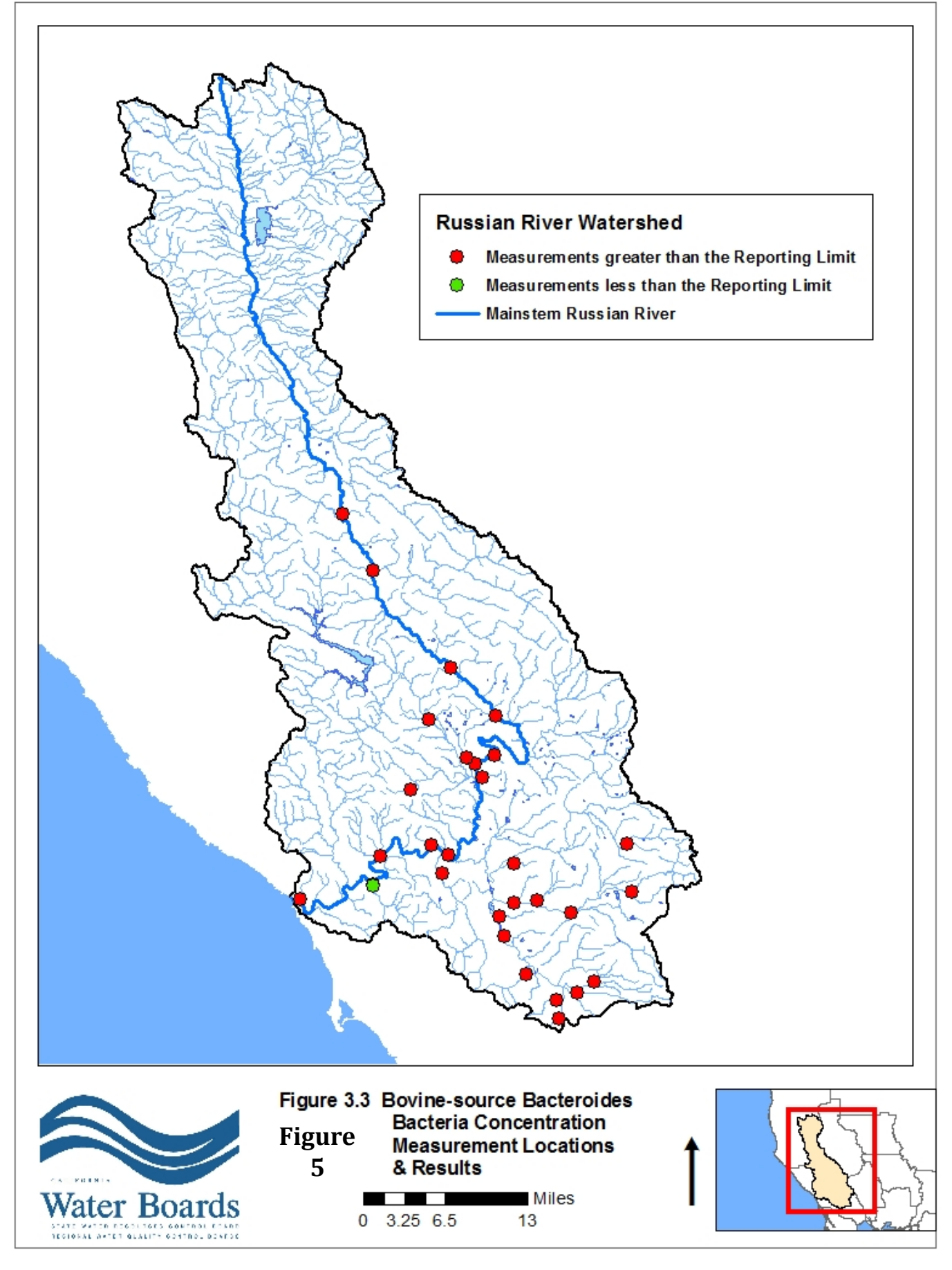
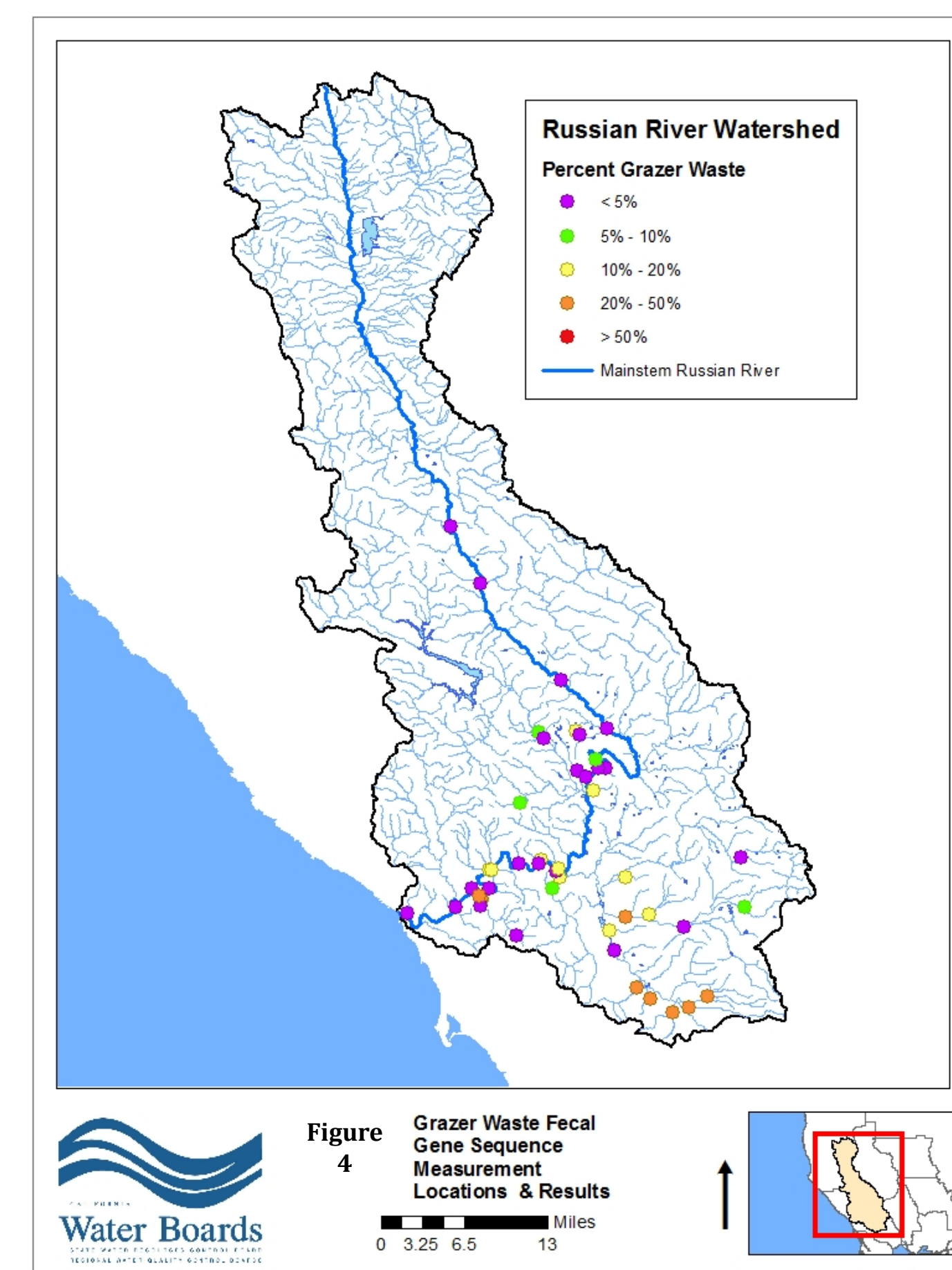
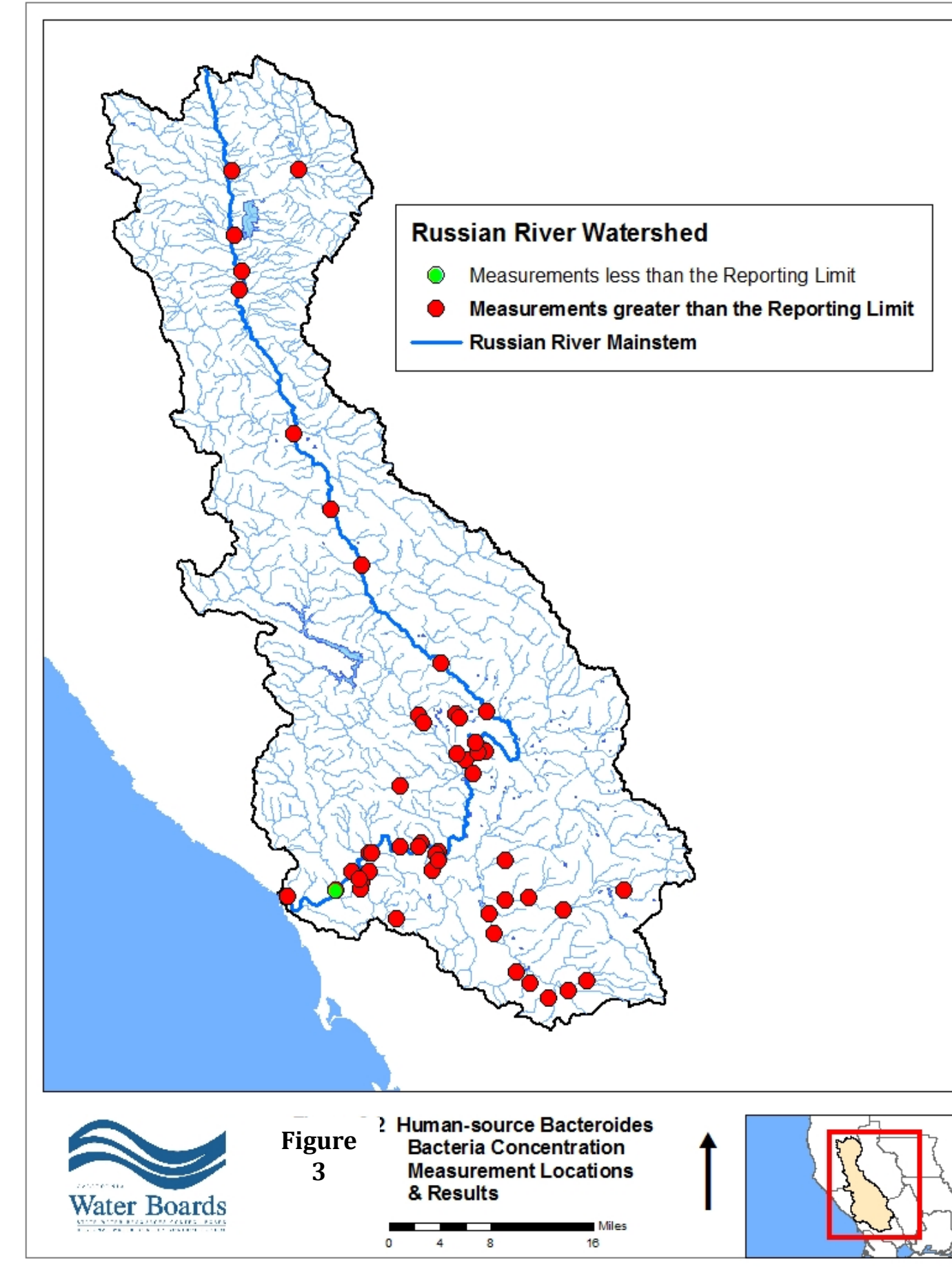
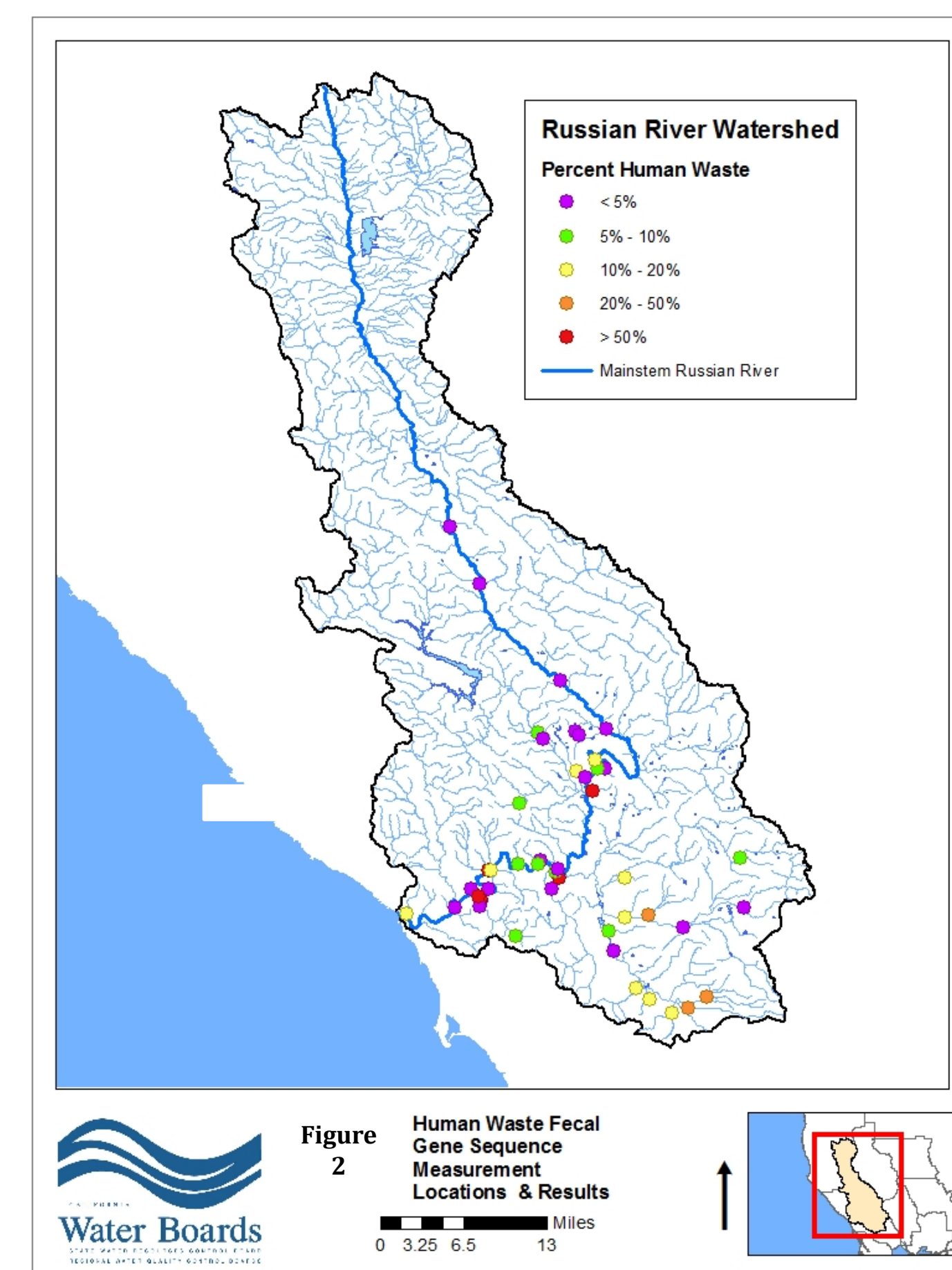
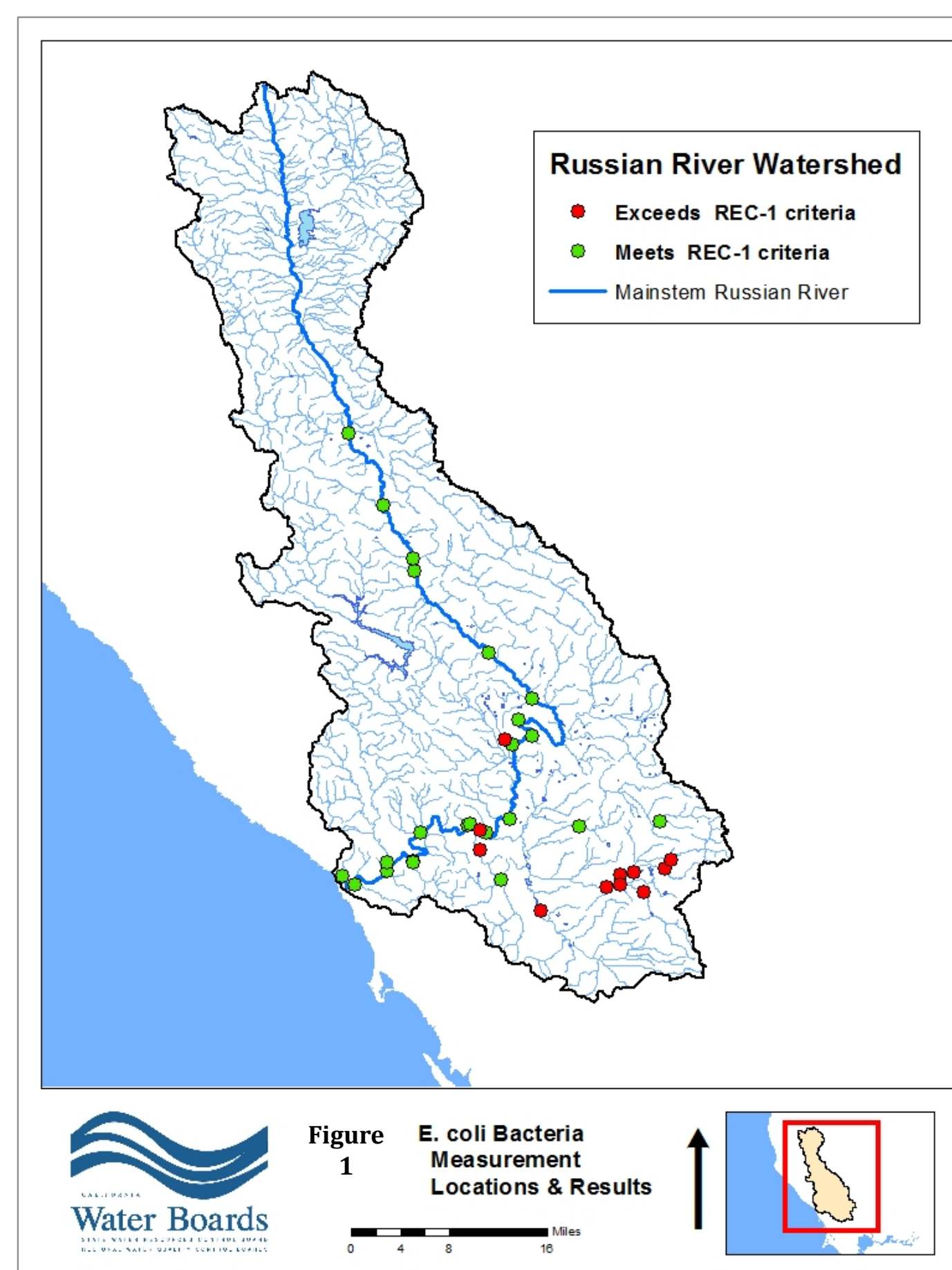
Human-specific Bacteroides Bacteria Concentrations Measured in the Russian River Watershed during Wet Periods by Land Cover Category.



Bovine-specific Bacteroides Bacteria Concentrations Measured in the Russian River Watershed during Wet Periods by Land Cover Category.

- #### Potential Implementation Actions:
- Management of Onsite Wastewater Treatment Systems (Septic Systems)
 - Management of Municipal Wastewater
 - Management of Recreational Water Use
 - Management of Human Waste from Homeless and Farmworker Encampments
 - Management of Animal Waste

Scope of Impact



E. coli REC-1 Criteria

Geometric Mean	Statistical Threshold Value
Estimated 36 illnesses per 1,000 recreators	410 cfu/100mL

Microbiological Source Identification Facts:

- Lab analysis identifies DNA gene sequences to estimate the percent of bacteria DNA matches between water sample and a known fecal source (i.e., raw sewage, septic waste, and human feces)
- Results expressed as % of bacterial DNA that matches known bacterial DNA from human waste

Current Reporting Limit = 60 genes/100mL
Presence = Exceedance of Reporting Limit
Presence = Exceedance of Natural Background Bacteria Objective

Links between Bacteroides & Illness

	Wade et al. (2010)	Ashbolt et al. (2010)
Estimated 30 illnesses per 1,000 recreators	60 genes/100mL	860 genes/100mL

Microbiological Source Identification Facts:

- Lab analysis identifies DNA gene sequences to estimate the percent of bacteria DNA matches between water sample and a known fecal source (i.e., cows, horses, deer, and elk)
- Results expressed as % of bacterial DNA that matches known bacterial DNA from human waste

Current Reporting Limit = 30 genes/100mL
Presence = Exceedance of Reporting Limit
Presence = Exceedance of Natural Background Bacteria Objective

Microbiological Source Identification Facts:

- Lab analysis identifies DNA gene sequences to estimate the percent of bacteria DNA matches between water sample and a known fecal source (i.e., gulls and pelicans)
- Results expressed as % of bacterial DNA that matches known bacterial DNA from human waste

Fecal Waste Data	% Human						% Grazer						% Shorebird																																																																																																																																																																																																																																																																																																																																																																																																																																			
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Human Sampling Locations	<table border="1"> <tr><td>Russian River at Cemetery Station Rd (S. of Cloverdale)</td><td>1</td><td>0</td><td>2</td><td>1</td><td>3</td><td>2</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Russian River at Cloverdale River Park (Cloverdale)</td><td>1</td><td>0</td><td>2</td><td>1</td><td>3</td><td>2</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Russian River at Hwy 128 Bridge (Georgetown)</td><td>2</td><td>1</td><td>2</td><td>1</td><td>1</td><td>3</td><td>2</td><td>1</td><td>2</td><td>1</td><td>3</td><td>1</td><td>2</td><td>1</td><td>3</td><td>2</td><td>1</td></tr> <tr><td>Russian River at Camp Rose (Healdsburg)</td><td>2</td><td>1</td><td>2</td><td>1</td><td>3</td><td>3</td><td>2</td><td>1</td><td>2</td><td>1</td><td>3</td><td>1</td><td>2</td><td>1</td><td>3</td><td>2</td><td>1</td></tr> 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Grazer Sampling Locations	<table border="1"> <tr><td>Palmer Cr. at Palmer Creek Road (Healdsburg)</td><td>6</td><td>2</td><td>8</td><td>2</td><td>3</td><td>5</td><td>6</td><td>2</td><td>8</td><td>2</td><td>3</td><td>5</td><td>6</td><td>2</td><td>8</td><td>2</td><td>3</td></tr> <tr><td>Unken Cr. at Old Highway (Healdsburg)</td><td>52</td><td>6</td><td>11</td><td>20</td><td>8</td><td>11</td><td>52</td><td>6</td><td>11</td><td>20</td><td>8</td><td>11</td><td>52</td><td>6</td><td>11</td><td>20</td><td>8</td></tr> <tr><td>Fox Cr. at Monterey Street (Healdsburg)</td><td>3</td><td>16</td><td>2</td><td>3</td><td>4</td><td>6</td><td>3</td><td>16</td><td>2</td><td>3</td><td>4</td><td>6</td><td>3</td><td>16</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>Unnamed Stream at Fish Mill Road (Healdsburg)</td><td>6</td><td>3</td><td>3</td><td>3</td><td>4</td><td>4</td><td>6</td><td>3</td><td>3</td><td>3</td><td>4</td><td>4</td><td>6</td><td>3</td><td>3</td><td>3</td><td>4</td></tr> <tr><td>Unnamed Stream at Summerhome Park Road (Forestville)</td><td>2</td><td>2</td><td>1</td><td>1</td><td>3</td><td>3</td><td>2</td><td>2</td><td>1</td><td>1</td><td>3</td><td>3</td><td>2</td><td>2</td><td>1</td><td>1</td><td>3</td></tr> <tr><td>Unnamed Stream at Summerhome Park Road (Forestville)</td><td>5</td><td>6</td><td>6</td><td>5</td><td>11</td><td>4</td><td>5</td><td>6</td><td>6</td><td>5</td><td>11</td><td>4</td><td>5</td><td>6</td><td>6</td><td>5</td><td>11</td></tr> <tr><td>Unnamed Stream at Freestone Road (Healdsburg)</td><td>5</td><td>54</td><td>8</td><td>5</td><td>8</td><td>8</td><td>5</td><td>54</td><td>8</td><td>5</td><td>8</td><td>8</td><td>5</td><td>54</td><td>8</td><td>5</td><td>8</td></tr> <tr><td>Unnamed Stream at Freestone Road (Healdsburg)</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr> <tr><td>Unnamed Stream at West Dry Creek Road (Healdsburg)</td><td>1</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>1</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>1</td><td>3</td><td>3</td><td>3</td><td>3</td></tr> <tr><td>Unnamed Stream at Alexander Valley Road (Healdsburg)</td><td>2</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>2</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>2</td><td>1</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>Unnamed Stream at Alexander Valley Road (Healdsburg)</td><td>2</td><td>2</td><td>3</td><td>3</td><td>3</td><td>3</td><td>2</td><td>2</td><td>3</td><td>3</td><td>3</td><td>3</td><td>2</td><td>2</td><td>3</td><td>3</td><td>3</td></tr> <tr><td>Unnamed Stream at Redwood Drive (Healdsburg)</td><td>10</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>10</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>10</td><td>6</td><td>6</td><td>6</td><td>6</td></tr> <tr><td>Unnamed Stream at Redwood Drive (Healdsburg)</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td></tr> <tr><td>Geopoll Cr. at Gilmore Ave (Geopoll)</td><td>2</td><td>24</td><td>2</td><td>30</td><td>6</td><td>8</td><td>2</td><td>24</td><td>2</td><td>30</td><td>6</td><td>8</td><td>2</td><td>24</td><td>2</td><td>30</td><td>6</td></tr> <tr><td>Colopol Cr. at Commerce Drive (Robert Park)</td><td>2</td><td>24</td><td>1</td><td>33</td><td>2</td><td>8</td><td>2</td><td>24</td><td>1</td><td>33</td><td>2</td><td>8</td><td>2</td><td>24</td><td>1</td><td>33</td><td>2</td></tr> <tr><td>Unnamed Stream at Redwood Drive (Healdsburg)</td><td>5</td><td>2</td><td>7</td><td>34</td><td>2</td><td>30</td><td>5</td><td>2</td><td>7</td><td>34</td><td>2</td><td>30</td><td>5</td><td>2</td><td>7</td><td>34</td><td>2</td></tr> <tr><td>Van Buren Cr. at St. Helena Road (S. of Santa Rosa)</td><td>2</td><td>5</td><td>2</td><td>4</td><td>6</td><td>5</td><td>2</td><td>5</td><td>2</td><td>4</td><td>6</td><td>5</td><td>2</td><td>5</td><td>2</td><td>4</td><td>6</td></tr> <tr><td>Santa Rosa Cr. at El Estero (El Estero)</td><td>1</td><td>1</td><td>1</td><td>1</td><td>4</td><td>5</td><td>1</td><td>1</td><td>1</td><td>1</td><td>4</td><td>5</td><td>1</td><td>1</td><td>1</td><td>1</td><td>4</td></tr> <tr><td>Point Cr. at Station Road (Sta. Rosa)</td><td>3</td><td>12</td><td>2</td><td>13</td><td>6</td><td>10</td><td>3</td><td>12</td><td>2</td><td>13</td><td>6</td><td>10</td><td>3</td><td>12</td><td>2</td><td>13</td><td>6</td></tr> <tr><td>Abraham Cr. at Willowside Road (S. of Santa Rosa)</td><td>9</td><td>16</td><td>9</td><td>16</td><td>7</td><td>14</td><td>9</td><td>16</td><td>9</td><td>16</td><td>7</td><td>14</td><td>9</td><td>16</td><td>9</td><td>16</td><td>7</td></tr> <tr><td>Blucher Cr. at Station Road (Sta. Rosa)</td><td>1</td><td>1</td><td>1</td><td>1</td><td>3</td><td>4</td><td>1</td><td>1</td><td>1</td><td>1</td><td>3</td><td>4</td><td>1</td><td>1</td><td>1</td><td>1</td><td>3</td></tr> <tr><td>Thurston Cr. at Station Road (Station)</td><td>8</td><td>11</td><td>15</td><td>14</td><td>11</td><td>11</td><td>8</td><td>11</td><td>15</td><td>14</td><td>11</td><td>11</td><td>8</td><td>11</td><td>15</td><td>14</td><td>11</td></tr> <tr><td>Laguna at Sebastopol Community Center (Sebastopol)</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr> </table>																		Palmer Cr. at Palmer Creek Road (Healdsburg)	6	2	8	2	3	5	6	2	8	2	3	5	6	2	8	2	3	Unken Cr. at Old Highway (Healdsburg)	52	6	11	20	8	11	52	6	11	20	8	11	52	6	11	20	8	Fox Cr. at Monterey Street (Healdsburg)	3	16	2	3	4	6	3	16	2	3	4	6	3	16	2	3	4	Unnamed Stream at Fish Mill Road (Healdsburg)	6	3	3	3	4	4	6	3	3	3	4	4	6	3	3	3	4	Unnamed Stream at Summerhome Park Road (Forestville)	2	2	1	1	3	3	2	2	1	1	3	3	2	2	1	1	3	Unnamed Stream at Summerhome Park Road (Forestville)	5	6	6	5	11	4	5	6	6	5	11	4	5	6	6	5	11	Unnamed Stream at Freestone Road (Healdsburg)	5	54	8	5	8	8	5	54	8	5	8	8	5	54	8	5	8	Unnamed Stream at Freestone Road (Healdsburg)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Unnamed Stream at West Dry Creek Road (Healdsburg)	1	3	3	3	3	3	1	3	3	3	3	3	1	3	3	3	3	Unnamed Stream at Alexander Valley Road (Healdsburg)	2	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	Unnamed Stream at Alexander Valley Road (Healdsburg)	2	2	3	3	3	3	2	2	3	3	3	3	2	2	3	3	3	Unnamed Stream at Redwood Drive (Healdsburg)	10	6	6	6	6	6	10	6	6	6	6	6	10	6	6	6	6	Unnamed Stream at Redwood Drive (Healdsburg)	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	Geopoll Cr. at Gilmore Ave (Geopoll)	2	24	2	30	6	8	2	24	2	30	6	8	2	24	2	30	6	Colopol Cr. at Commerce Drive (Robert Park)	2	24	1	33	2	8	2	24	1	33	2	8	2	24	1	33	2	Unnamed Stream at Redwood Drive (Healdsburg)	5	2	7	34	2	30	5	2	7	34	2	30	5	2	7	34	2	Van Buren Cr. at St. Helena Road (S. of Santa Rosa)	2	5	2	4	6	5	2	5	2	4	6	5	2	5	2	4	6	Santa Rosa Cr. at El Estero (El Estero)	1	1	1	1	4	5	1	1	1	1	4	5	1	1	1	1	4	Point Cr. at Station Road (Sta. Rosa)	3	12	2	13	6	10	3	12	2	13	6	10	3	12	2	13	6	Abraham Cr. at Willowside Road (S. of Santa Rosa)	9	16	9	16	7	14	9	16	9	16	7	14	9	16	9	16	7	Blucher Cr. at Station Road (Sta. Rosa)	1	1	1	1	3	4	1	1	1	1	3	4	1	1	1	1	3	Thurston Cr. at Station Road (Station)	8	11	15	14	11	11	8	11	15	14	11	11	8	11	15	14	11	Laguna at Sebastopol Community Center (Sebastopol)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Palmer Cr. at Palmer Creek Road (Healdsburg)	6	2	8	2	3	5	6	2	8	2	3	5	6	2	8	2	3																																																																																																																																																																																																																																																																																																																																																																																																																															
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Unnamed Stream at Freestone Road (Healdsburg)	5	54	8	5	8	8	5	54	8	5	8	8	5	54	8	5	8																																																																																																																																																																																																																																																																																																																																																																																																																															
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Unnamed Stream at West Dry Creek Road (Healdsburg)	1	3	3	3	3	3	1	3	3	3	3	3	1	3	3	3	3																																																																																																																																																																																																																																																																																																																																																																																																																															
Unnamed Stream at Alexander Valley Road (Healdsburg)	2	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1																																																																																																																																																																																																																																																																																																																																																																																																																															
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Colopol Cr. at Commerce Drive (Robert Park)	2	24	1	33	2	8	2	24	1	33	2	8	2	24	1	33	2																																																																																																																																																																																																																																																																																																																																																																																																																															
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Van Buren Cr. at St. Helena Road (S. of Santa Rosa)	2	5	2	4	6	5	2	5	2	4	6	5	2	5	2	4	6																																																																																																																																																																																																																																																																																																																																																																																																																															
Santa Rosa Cr. at El Estero (El Estero)	1	1	1	1	4	5	1	1	1	1	4	5	1	1	1	1	4																																																																																																																																																																																																																																																																																																																																																																																																																															
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Shorebird Sampling Locations	<table border="1"> <tr><td>Green Valley Cr. at Marinelli Road (Forestville)</td><td>1</td><td>5</td><td>1</td><td>5</td><td>1</td><td>5</td><td>1</td><td>5</td><td>1</td><td>5</td><td>1</td><td>5</td><td>1</td><td>5</td><td>1</td><td>5</td><td>1</td></tr> <tr><td>Woolley Cr. at River Rd (Forestville)</td><td>1</td><td>12</td><td>2</td><td>18</td><td>3</td><td>10</td><td>1</td><td>12</td><td>2</td><td>18</td><td>3</td><td>10</td><td>1</td><td>12</td><td>2</td><td>18</td><td>3</td></tr> <tr><td>Fox Cr. at Monterey Street (Healdsburg)</td><td>7</td><td>16</td><td>5</td><td>11</td><td>6</td><td>6</td><td>7</td><td>16</td><td>5</td><td>11</td><td>6</td><td>6</td><td>7</td><td>16</td><td>5</td><td>11</td><td>6</td></tr> <tr><td>Unnamed Stream at Summerhome Park Road (Forestville)</td><td>2</td><td>2</td><td>1</td><td>1</td><td>3</td><td>3</td><td>2</td><td>2</td><td>1</td><td>1</td><td>3</td><td>3</td><td>2</td><td>2</td><td>1</td><td>1</td><td>3</td></tr> <tr><td>Unnamed Stream at Summerhome Park Road (Forestville)</td><td>9</td><td>2</td><td>2</td><td>2</td><td>4</td><td>4</td><td>9</td><td>2</td><td>2</td><td>2</td><td>4</td><td>4</td><td>9</td><td>2</td><td>2</td><td>2</td><td>4</td></tr> <tr><td>Unnamed Stream at Summerhome Park Road (Forestville)</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr> <tr><td>Unnamed Stream at Freestone Road (Healdsburg)</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td></tr> <tr><td>Unnamed Stream at Freestone Road (Healdsburg)</td><td>41</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>41</td><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td><td>41</td><td>7</td><td>7</td><td>7</td><td>7</td></tr> <tr><td>Unnamed Stream at Freestone Road (Healdsburg)</td><td>54</td><td>34</td><td>34</td><td>34</td><td>34</td><td>34</td><td>54</td><td>34</td><td>34</td><td>34</td><td>34</td><td>34</td><td>54</td><td>34</td><td>34</td><td>34</td><td>34</td></tr> <tr><td>Unnamed Stream at Del Rio Court (Forestville)</td><td>6</td><td>6</td><td>2</td><td>2</td><td>4</td><td>4</td><td>6</td><td>6</td><td>2</td><td>2</td><td>4</td><td>4</td><td>6</td><td>6</td><td>2</td><td>2</td><td>4</td></tr> <tr><td>Unnamed Stream at Del Rio Court (Forestville)</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td><td>9</td></tr> <tr><td>Unnamed Stream at Lakeview Avenue (Camp Meeker)</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td></tr> <tr><td>Unnamed Stream at Lakeview Avenue (Camp Meeker)</td><td>8</td><td>2</td><td>5</td><td>5</td><td>5</td><td>5</td><td>8</td><td>2</td><td>5</td><td>5</td><td>5</td><td>5</td><td>8</td><td>2</td><td>5</td><td>5</td><td>5</td></tr> <tr><td>Unnamed Stream at Lakeview Avenue (Camp Meeker)</td><td>5</td><td>1</td><td>6</td><td>3</td><td>10</td><td>6</td><td>5</td><td>1</td><td>6</td><td>3</td><td>10</td><td>6</td><td>5</td><td>1</td><td>6</td><td>3</td><td>10</td></tr> <tr><td>Unnamed Stream at River Road (Monte Rio)</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>Unnamed Stream at River Road (Monte Rio)</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr> <tr><td>Unnamed Stream at Old Monte Rio Road (Monte Rio)</td><td>4</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>4</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>4</td><td>1</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>Unnamed Stream at Main Street (Monte Rio)</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr> <tr><td>Unnamed Stream at Main Street (Monte Rio)</td><td>88</td><td>23</td><td>23</td><td>23</td><td>23</td><td>23</td><td>88</td><td>23</td><td>23</td><td>23</td><td>23</td><td>23</td><td>88</td><td>23</td><td>23</td><td>23</td><td>23</td></tr> <tr><td>Unnamed Stream at Moscow Road (Duncan's Mill)</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr> </table>																		Green Valley Cr. at Marinelli Road (Forestville)	1	5	1	5	1	5	1	5	1	5	1	5	1	5	1	5	1	Woolley Cr. at River Rd (Forestville)	1	12	2	18	3	10	1	12	2	18	3	10	1	12	2	18	3	Fox Cr. at Monterey Street (Healdsburg)	7	16	5	11	6	6	7	16	5	11	6	6	7	16	5	11	6	Unnamed Stream at Summerhome Park Road (Forestville)	2	2	1	1	3	3	2	2	1	1	3	3	2	2	1	1	3	Unnamed Stream at Summerhome Park Road (Forestville)	9	2	2	2	4	4	9	2	2	2	4	4	9	2	2	2	4	Unnamed Stream at Summerhome Park Road (Forestville)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Unnamed Stream at Freestone Road (Healdsburg)	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	Unnamed Stream at Freestone Road (Healdsburg)	41	7	7	7	7	7	41	7	7	7	7	7	41	7	7	7	7	Unnamed Stream at Freestone Road (Healdsburg)	54	34	34	34	34	34	54	34	34	34	34	34	54	34	34	34	34	Unnamed Stream at Del Rio Court (Forestville)	6	6	2	2	4	4	6	6	2	2	4	4	6	6	2	2	4	Unnamed Stream at Del Rio Court (Forestville)	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	Unnamed Stream at Lakeview Avenue (Camp Meeker)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	Unnamed Stream at Lakeview Avenue (Camp Meeker)	8	2	5	5	5	5	8	2	5	5	5	5	8	2	5	5	5	Unnamed Stream at Lakeview Avenue (Camp Meeker)	5	1	6	3	10	6	5	1	6	3	10	6	5	1	6	3	10	Unnamed Stream at River Road (Monte Rio)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Unnamed Stream at River Road (Monte Rio)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Unnamed Stream at Old Monte Rio Road (Monte Rio)	4	1	1	1	1	1	4	1	1	1	1	1	4	1	1	1	1	Unnamed Stream at Main Street (Monte Rio)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	Unnamed Stream at Main Street (Monte Rio)	88	23	23	23	23	23	88	23	23	23	23	23	88	23	23	23	23	Unnamed Stream at Moscow Road (Duncan's Mill)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2																																																						
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Unnamed Stream at Freestone Road (Healdsburg)	54	34	34	34	34	34	54	34	34	34	34	34	54	34	34	34	34																																																																																																																																																																																																																																																																																																																																																																																																																															
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Unnamed Stream at Lakeview Avenue (Camp Meeker)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3																																																																																																																																																																																																																																																																																																																																																																																																																															
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Unnamed Stream at Lakeview Avenue (Camp Meeker)	5	1	6	3	10	6	5	1	6	3	10	6	5	1	6	3	10																																																																																																																																																																																																																																																																																																																																																																																																																															
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Unnamed Stream at Old Monte Rio Road (Monte Rio)	4	1	1	1	1	1	4	1	1	1	1	1	4	1	1	1	1																																																																																																																																																																																																																																																																																																																																																																																																																															
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Unnamed Stream at Main Street (Monte Rio)	88	23	23	23	23	23	88	23	23	23	23	23	88	23	23	23	23																																																																																																																																																																																																																																																																																																																																																																																																																															
Unnamed Stream at Moscow Road (Duncan's Mill)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2																																																																																																																																																																																																																																																																																																																																																																																																																															

Human, Grazer & Shorebird Fecal Waste Data
These same data are presented in Figures 2, 4, and 6 above

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