Integrated Approach Results in Innovative Coastal Action Plan to Improve Water Quality in the Trinidad ASBS

Rebecca Crow, PE

WINZLER & KELLY

Bob Brown, AICP

Streamline Planning Consultants

Humboldt County
CALIFORNIA
San Francisco
Los Angeles
Pacific Ocean

Humboldt County
N
W
E
S
101
ORICK
ORLEANS
WEITCHPEC
96
HOOPA
TRINIDAD
WESTHAVEN
WILLOW CREEK
299
ARCATA
EUREKA
101
LOLETA
FERNDALE
FORTUNA
RIO DELL
BRIDGEVILLE
36
PETROLIA
WEOTT
MYERS FLAT
101
REDWAY
GARBERVILLE

Megwil Point
Elk Head
Lepoil Rock
Omenaku Point
College Creek
Powetole Island
Trinidad
Flatiron Rock
Blank Rock
Little Head
Trinidad Head
US COAST GUARD RESERVATION
Lighthouse
Prisoner Rock
Flat Rock
Camel Rock

Community of Stakeholders and Plan Participants

City of Trinidad

HUMBOLDT STATE UNIVERSITY

Trinidad Rancheria

WESTHAVEN COMMUNITY SERVICES DISTRICT

P.O. Box 2015 (446B 6th Ave. Westhaven) Trinidad CA 95570 (707) 677-0798 wcsd@humboldt1.com

COUNTY OF HUMBOLDT

The Home of the Redwoods

Yurok Tribe

WINZLER&KELLY

CALIFORNIA COASTAL COMMISSION

Streamline Planning Consultants

Natural Resources Services

A Division of Redwood Community Action Agency

Coastal Conservancy

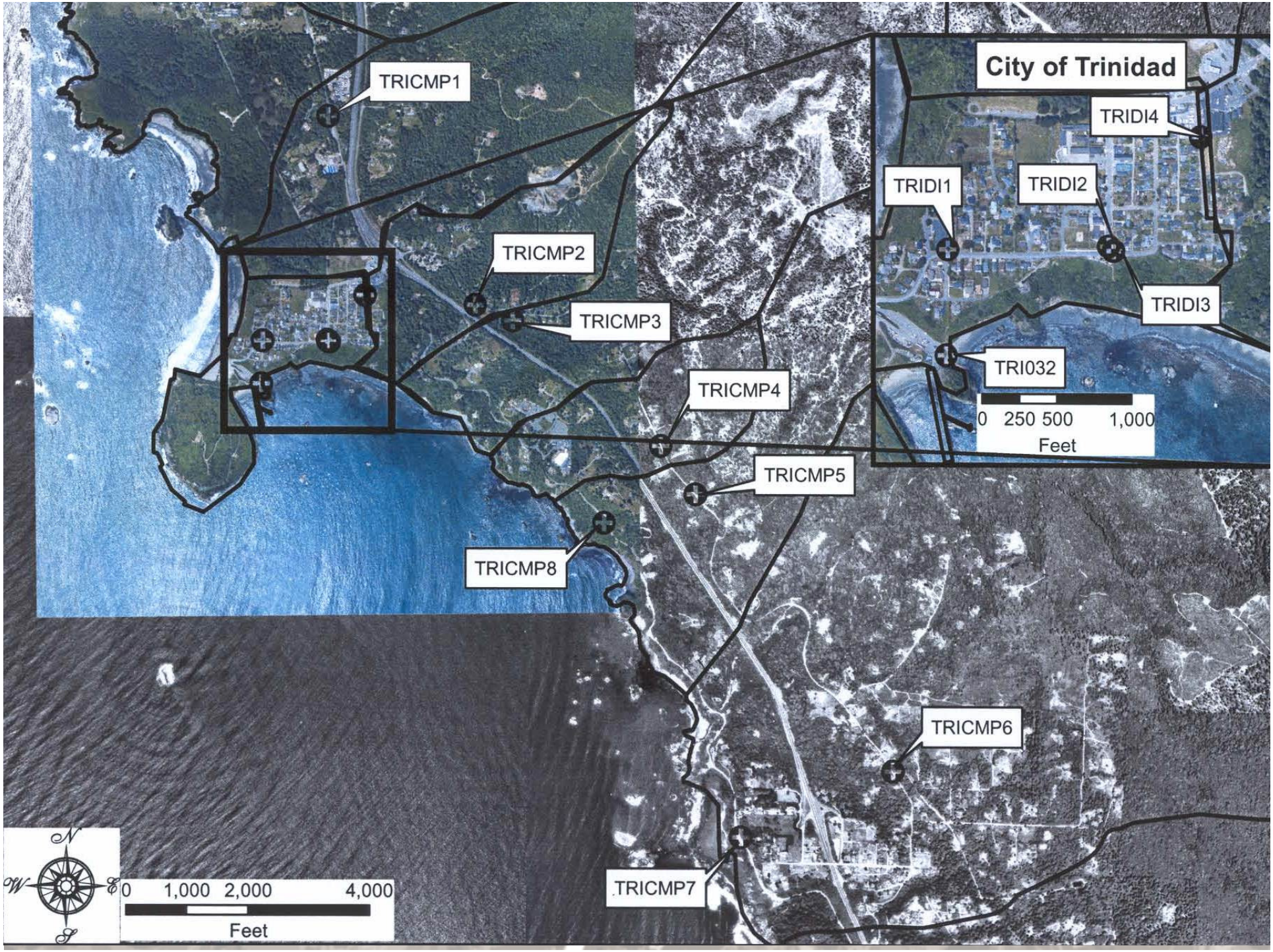
Water Boards

RESOURCES AGENCY CALIFORNIA DEPARTMENT FISH&GAME

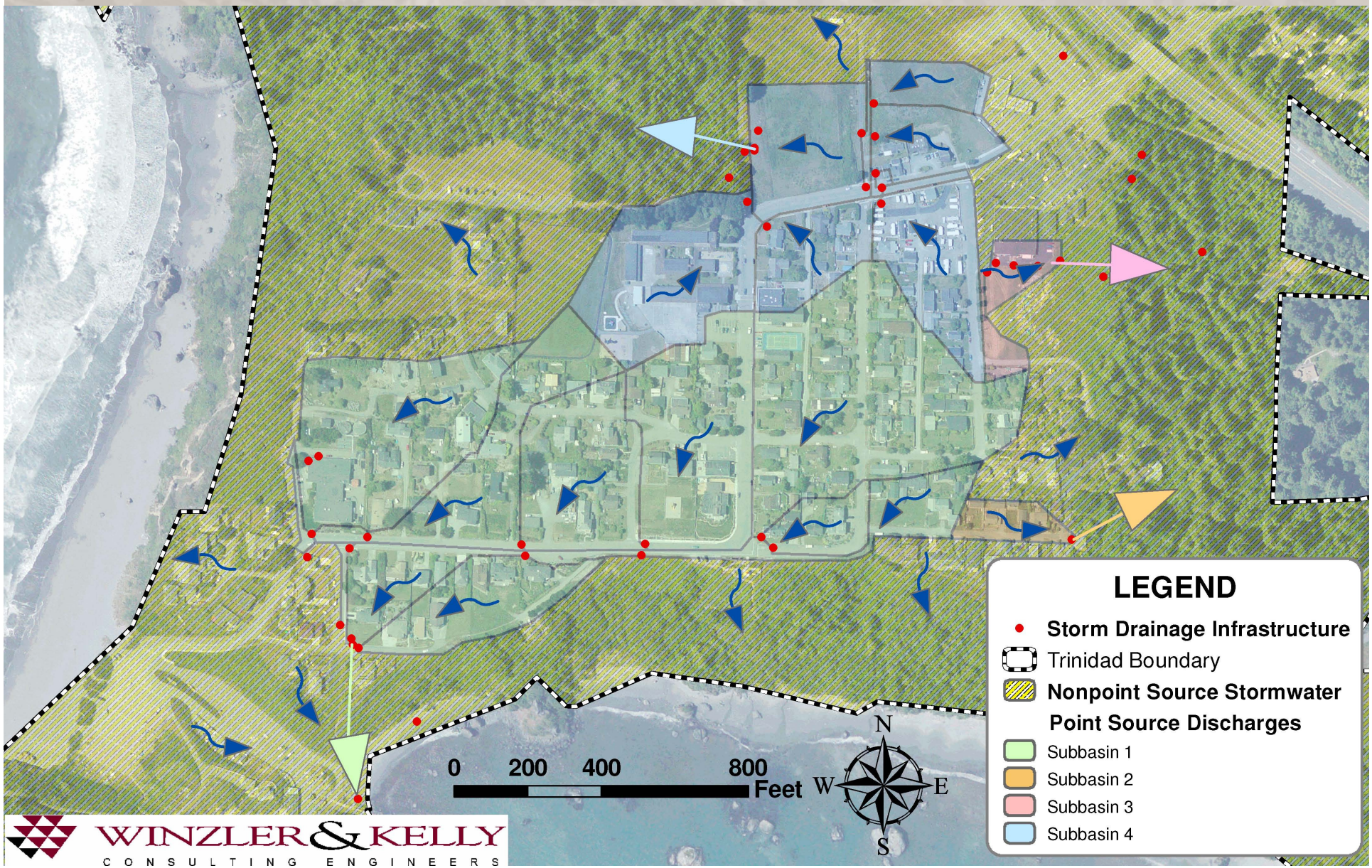
GREEN DIAMOND RESOURCE COMPANY

CICORE

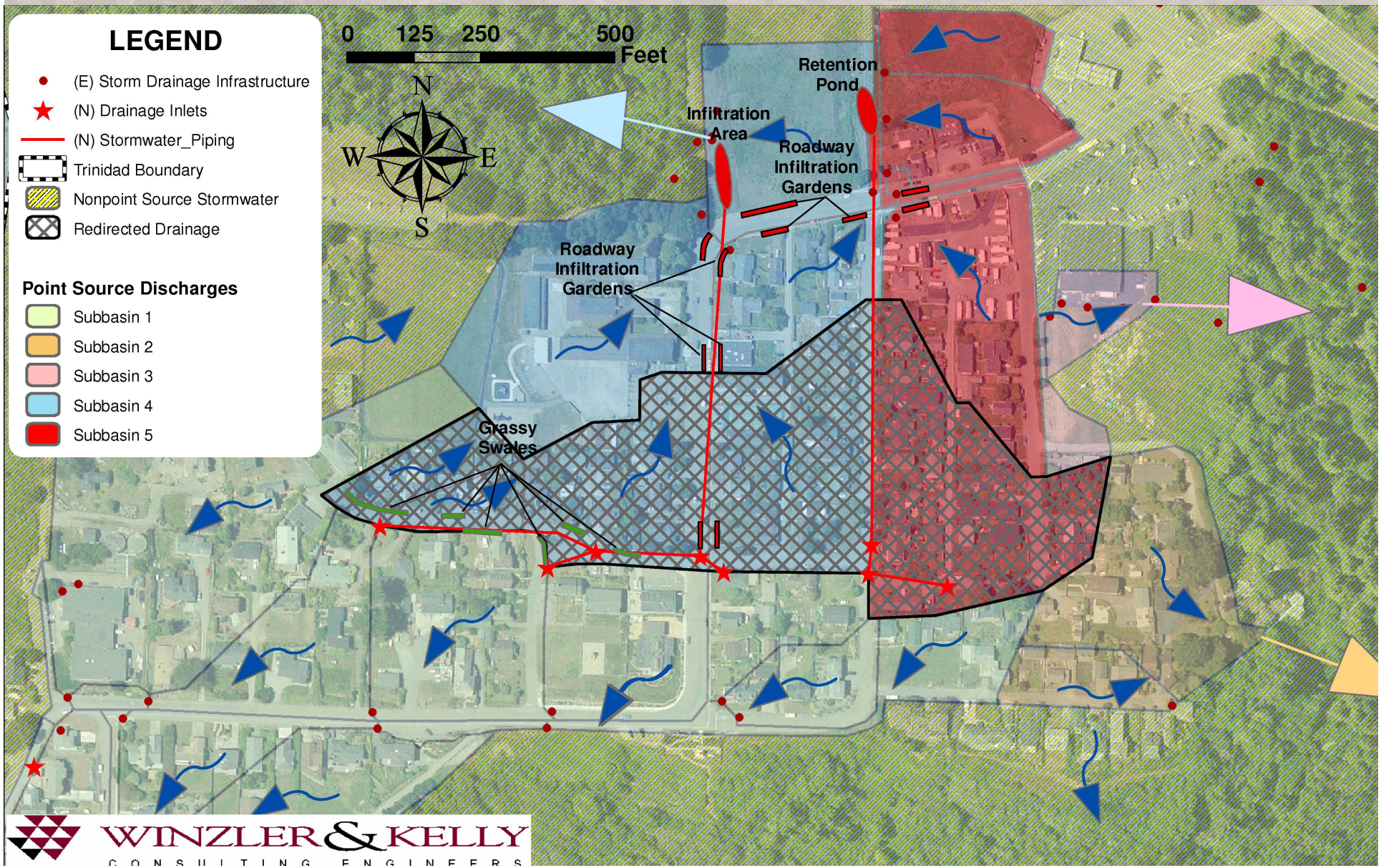
CALIFORNIA STATE PARKS SINCE 1864

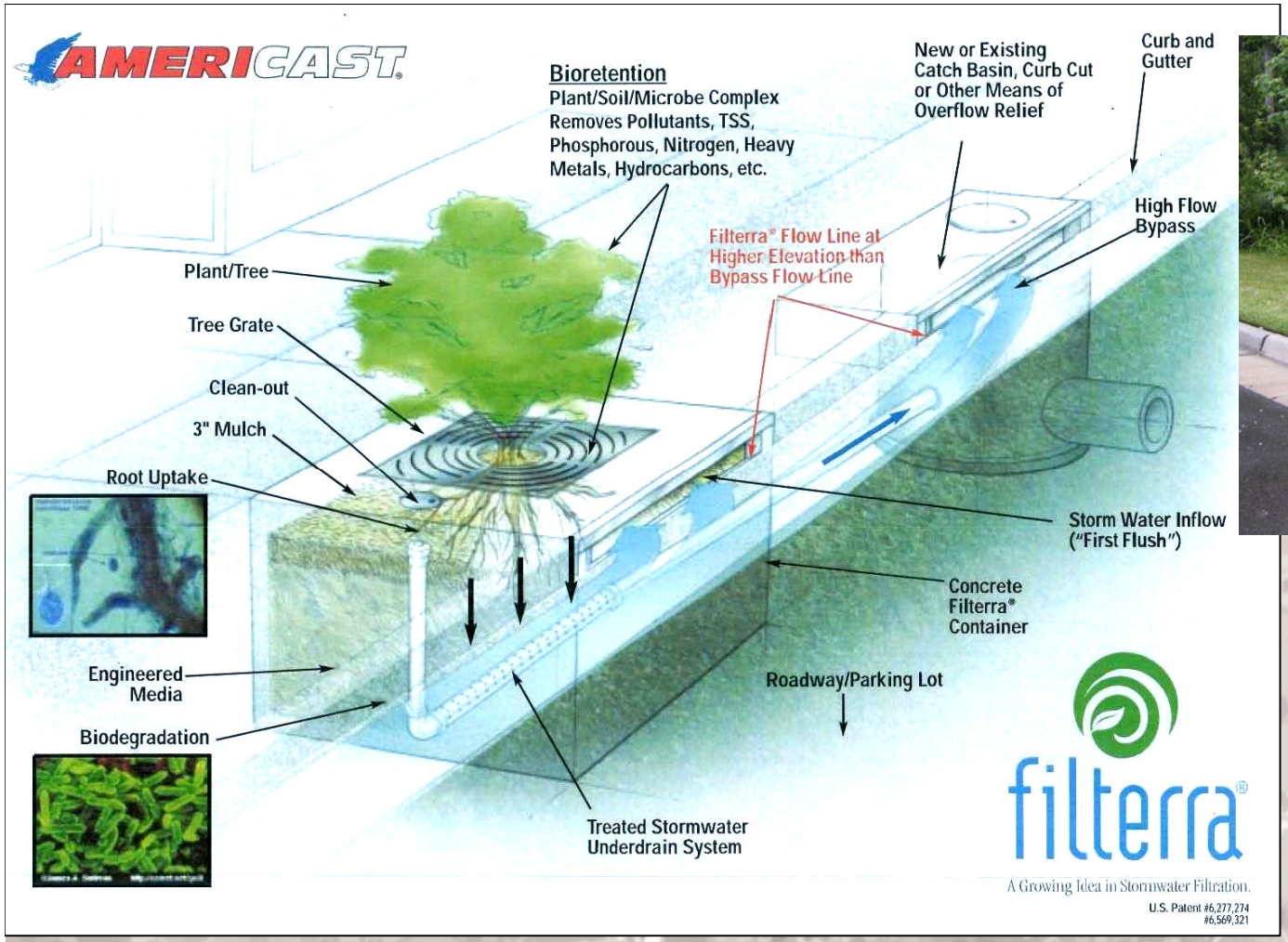

City of Trinidad
TRICMP1
TRICMP2
TRICMP3
TRICMP4
TRICMP5
TRICMP6
TRICMP7
TRICMP8
TRIDI1
TRIDI2
TRIDI3
TRIDI4
TRI032
0 250 500 1,000
Feet
0 1,000 2,000 4,000
Feet
N
W
E
S

Existing Stormwater Conditions

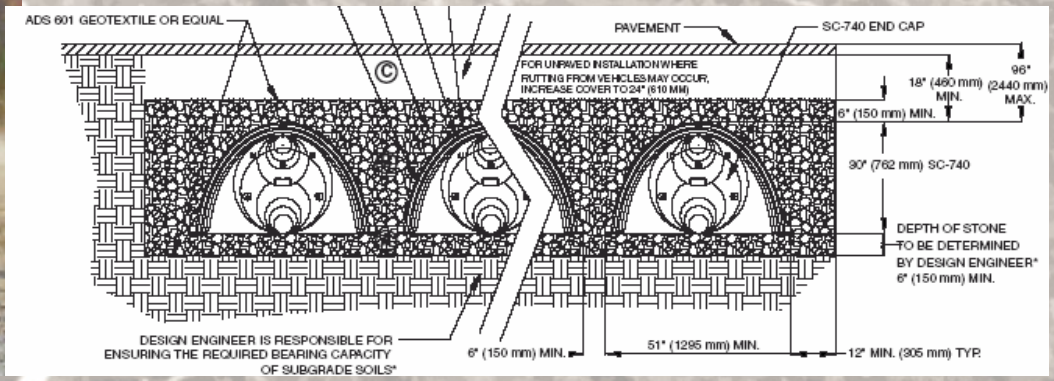


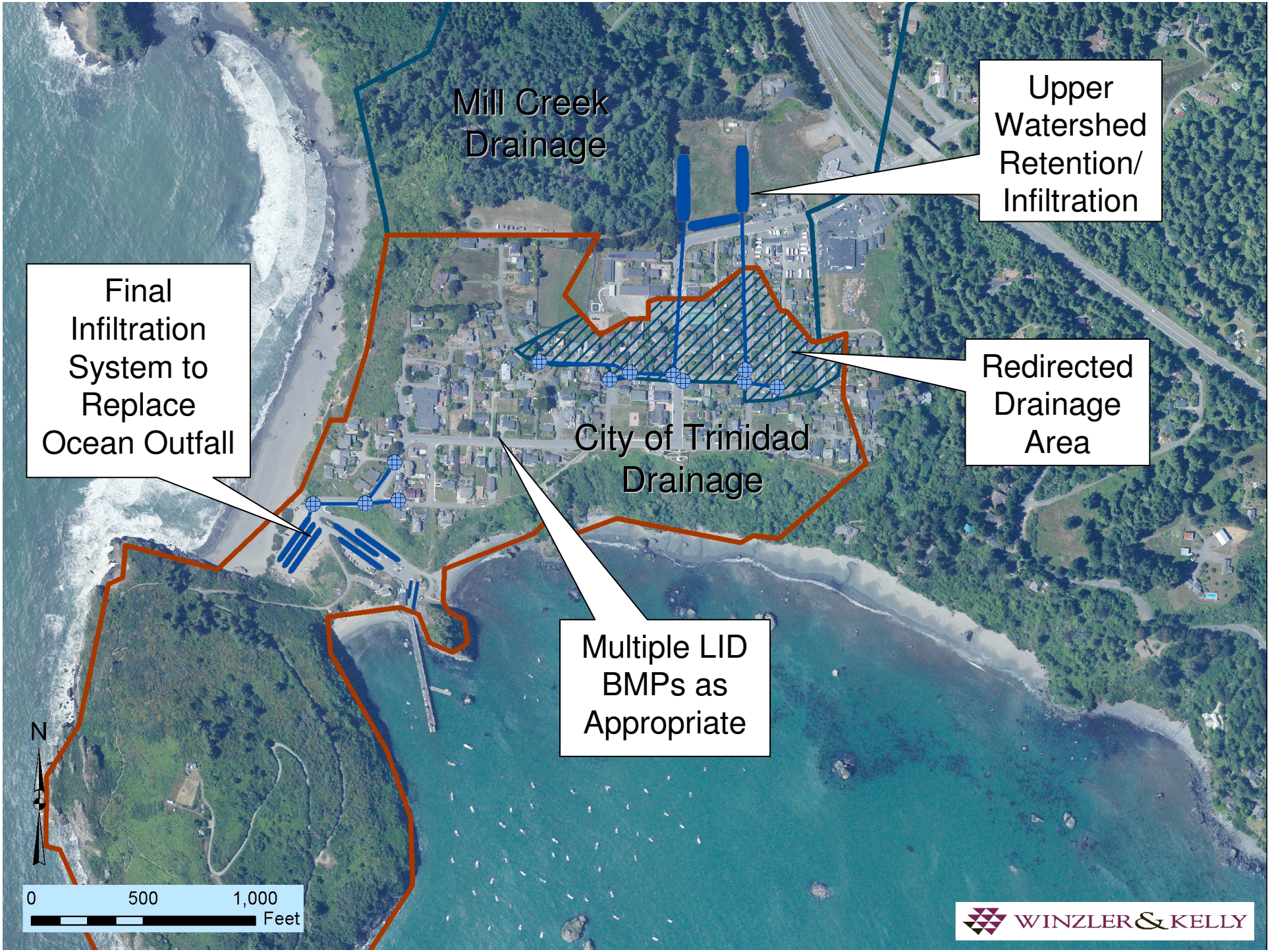
Stormwater Draft Action Plan





StormTech®
Detention • Retention • Recharge
Subsurface Stormwater Management™




Mill Creek Drainage
Upper Watershed Retention/ Infiltration
Final Infiltration System to Replace Ocean Outfall
Redirected Drainage Area
City of Trinidad Drainage
Multiple LID BMPs as Appropriate
N
0
500
1,000
Feet
WINZLER & KELLY

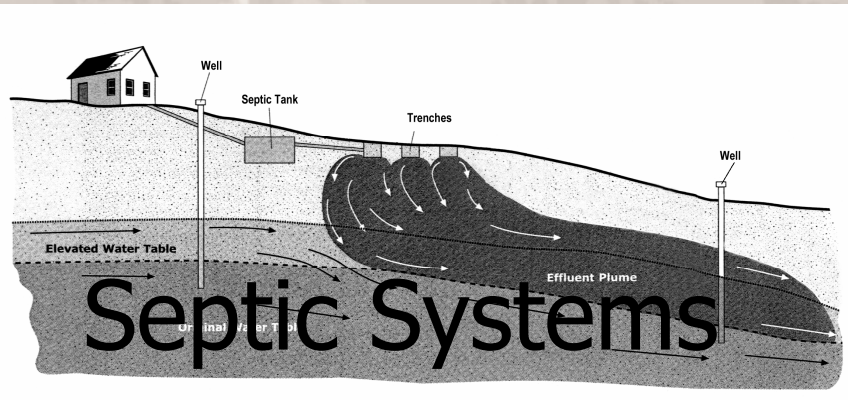
Development of an Integrated Watershed Assessment Program

Water Quality Management –Wastewater

City of Trinidad

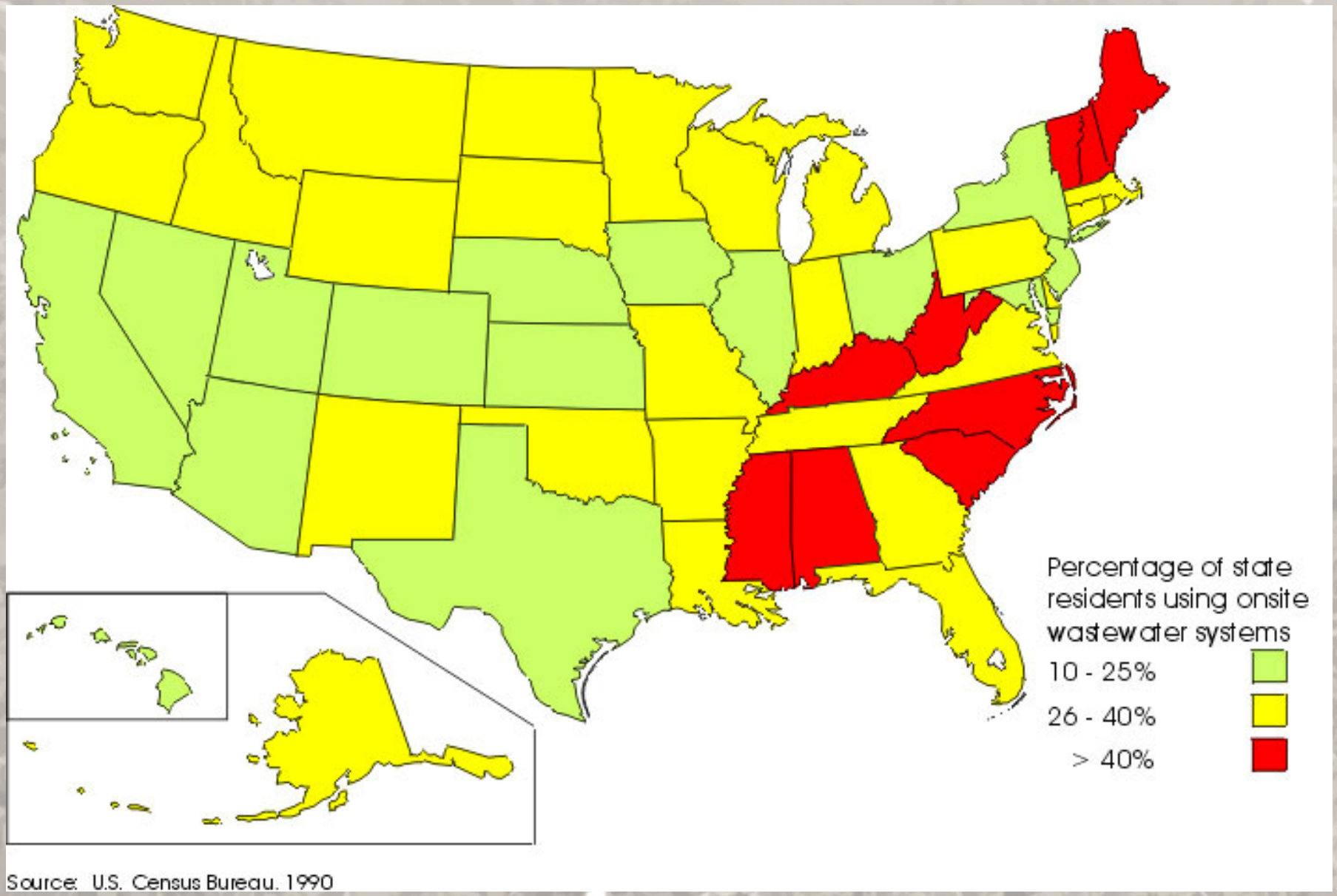
Potential Sources of Fecal Bacteria

There are only 3 possible sources in our watersheds



‘Sorbital-Fermenting Bifidobacteria as Indicator of Diffuse Faecal Pollution in Estuarine Watersheds’

Use of OWTSs


Percentage of state residents using onsite wastewater systems
10 - 25%
26 - 40%
> 40%
Source: U.S. Census Bureau, 1990

Optical Brighteners

- Found Only in Laundry and Dish Detergents
- Sample with Bacteria
- Distinguish Human/Non-Human Bacteria Sources

Optical Brighteners

- Removes tough sta
- Brightens colors
- Whitens whites
- Safe for every load

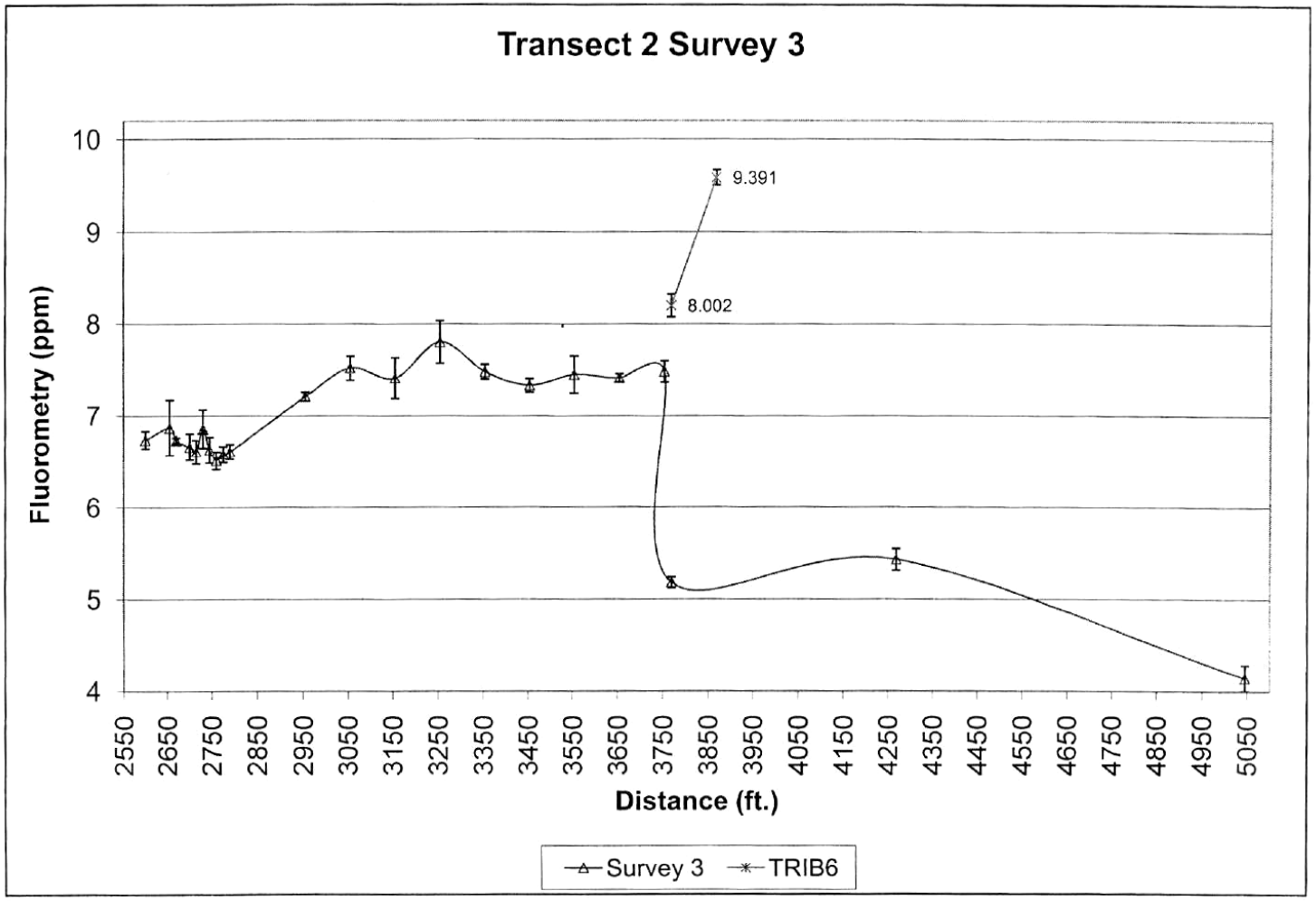
INGREDIENTS: SODIUM CARBONATE, INORGANIC SALTS, SODIUM PERBORATE, ENZYMES, FRAGRANCE, FABRIC BRIGHTENING AGENT, AND COLORANT.

Source Tracking

- Turner Design Aquafluor
- Fluorometer to track Optical Brighteners

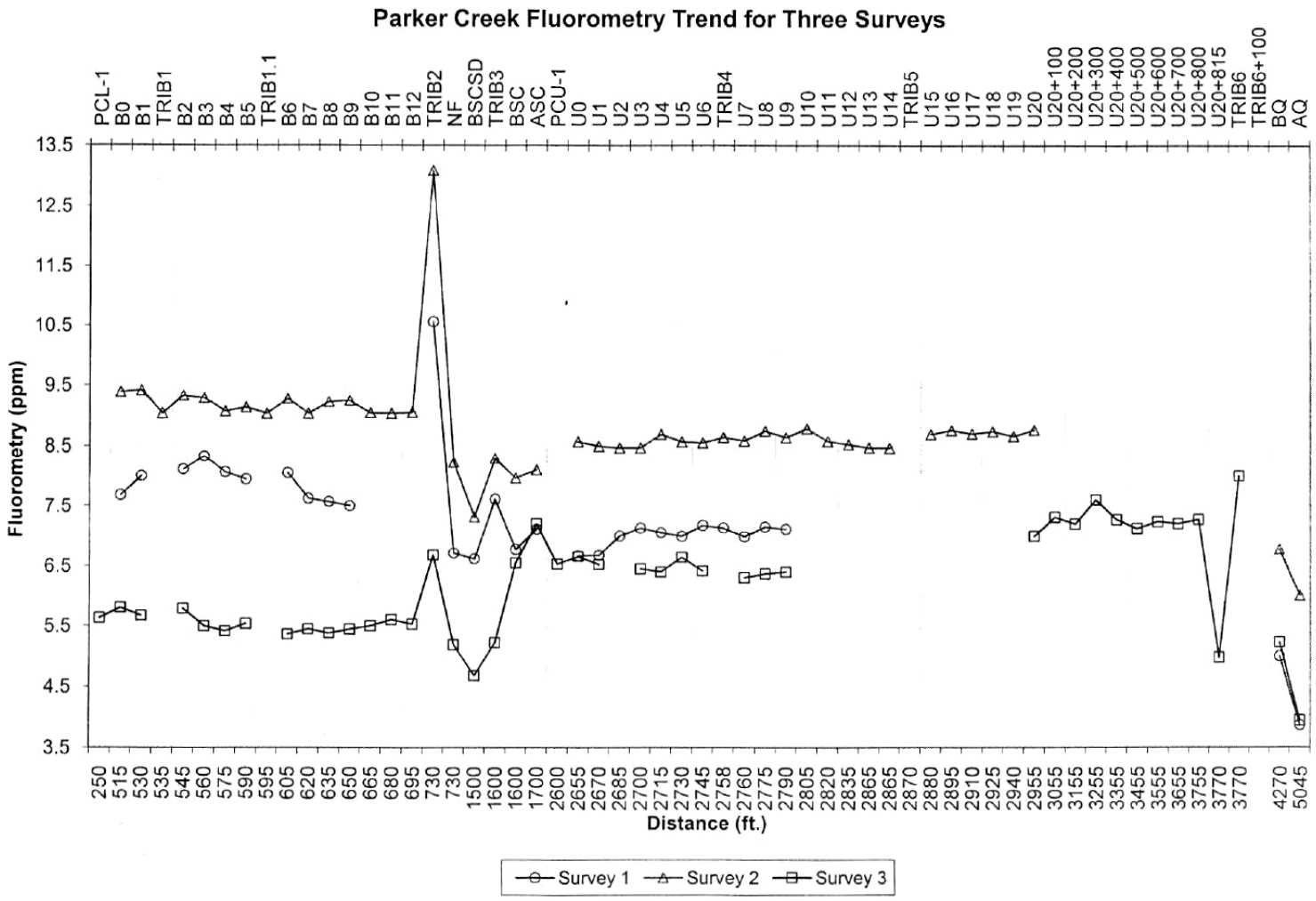
Optical Brighteners Graph

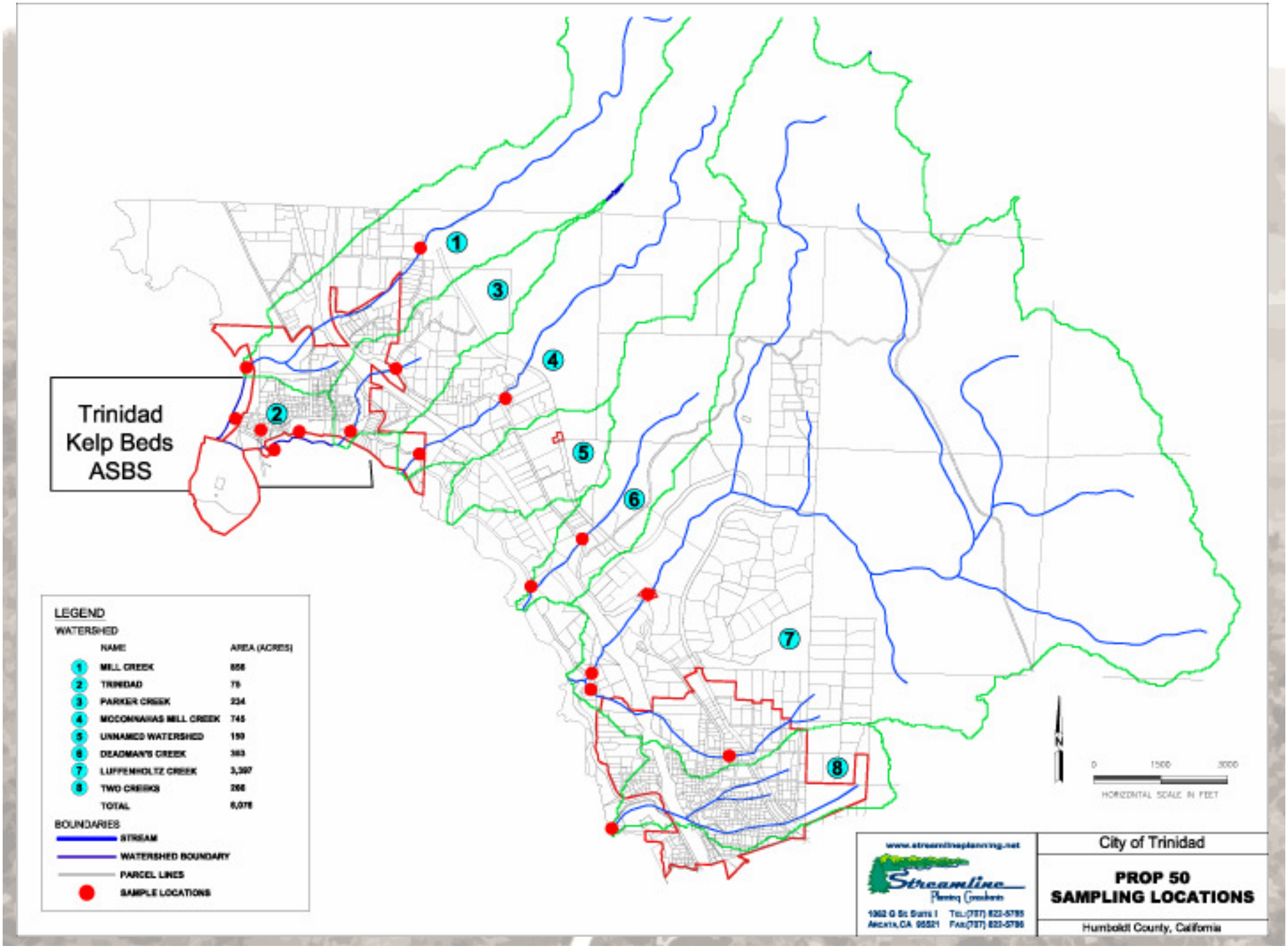
Note Increase at Tributary

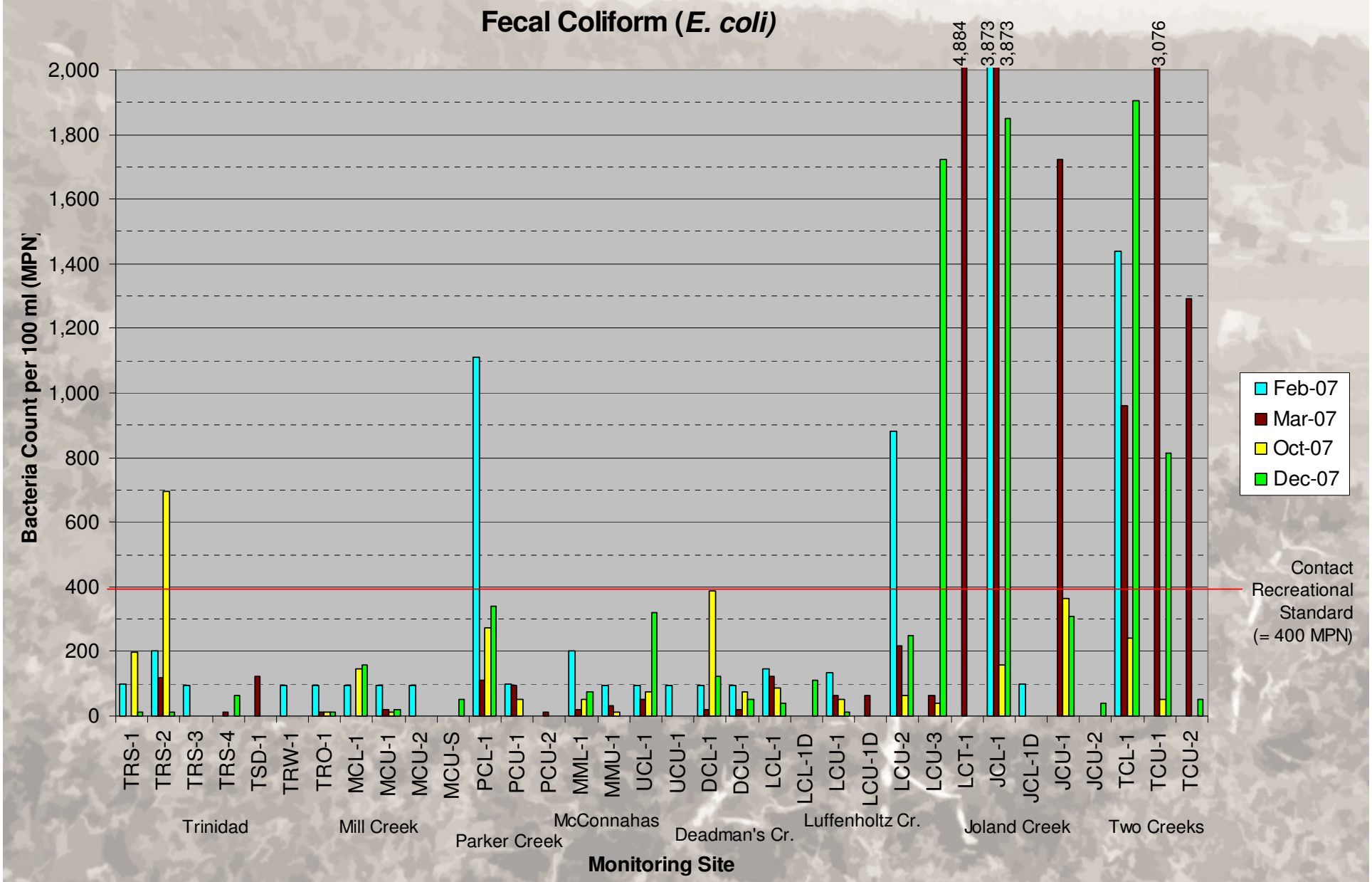


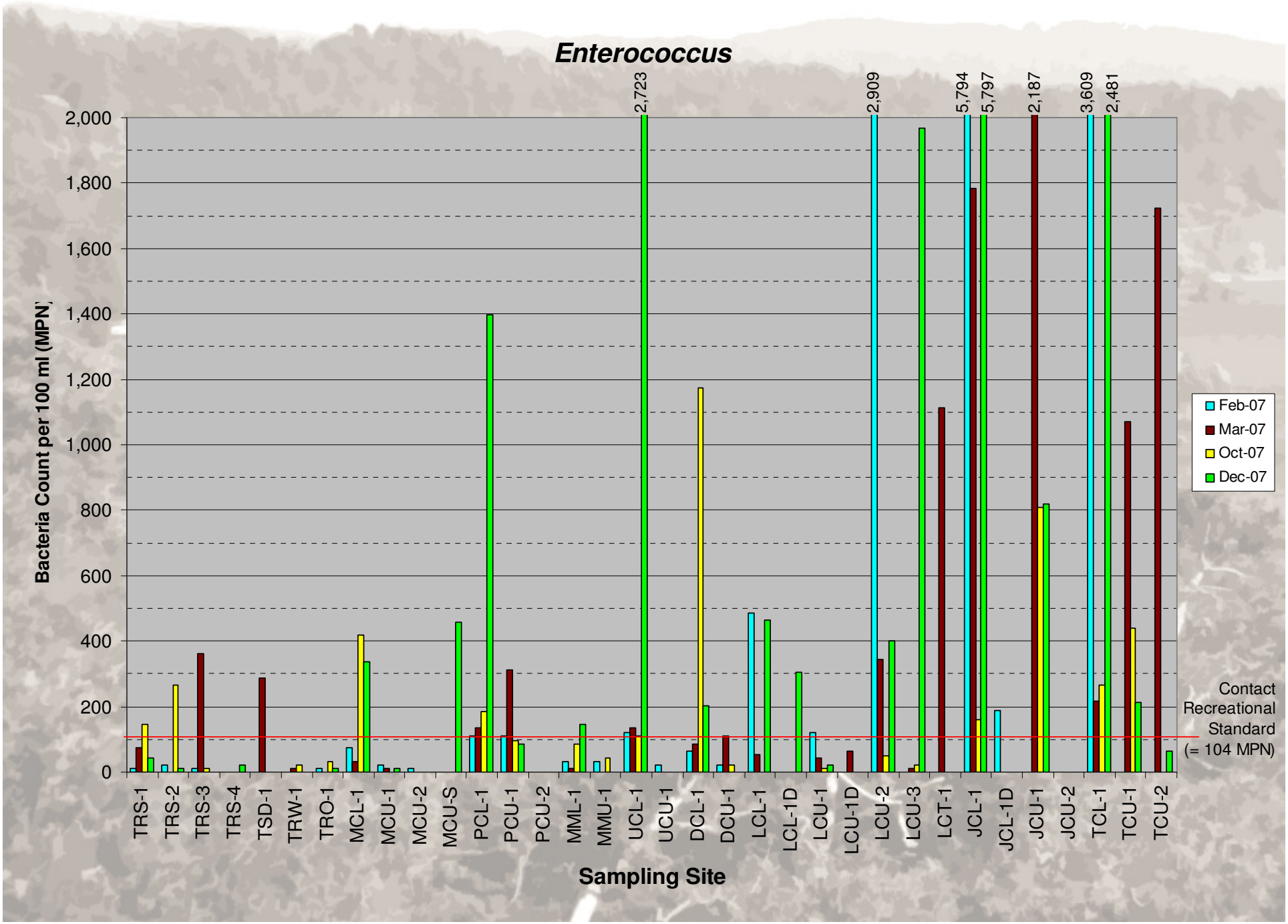
Optical Brighteners Graph

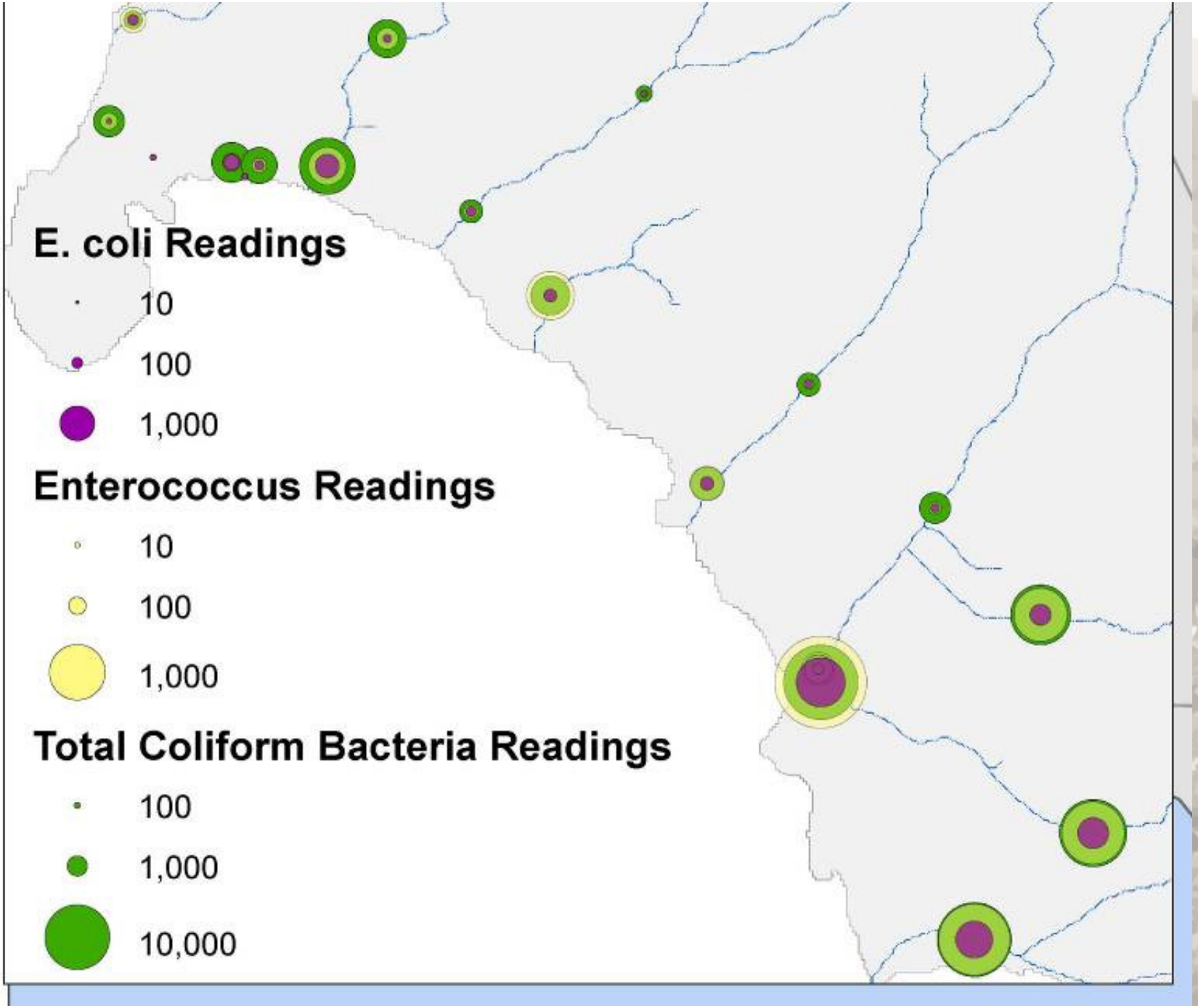
Note Spike

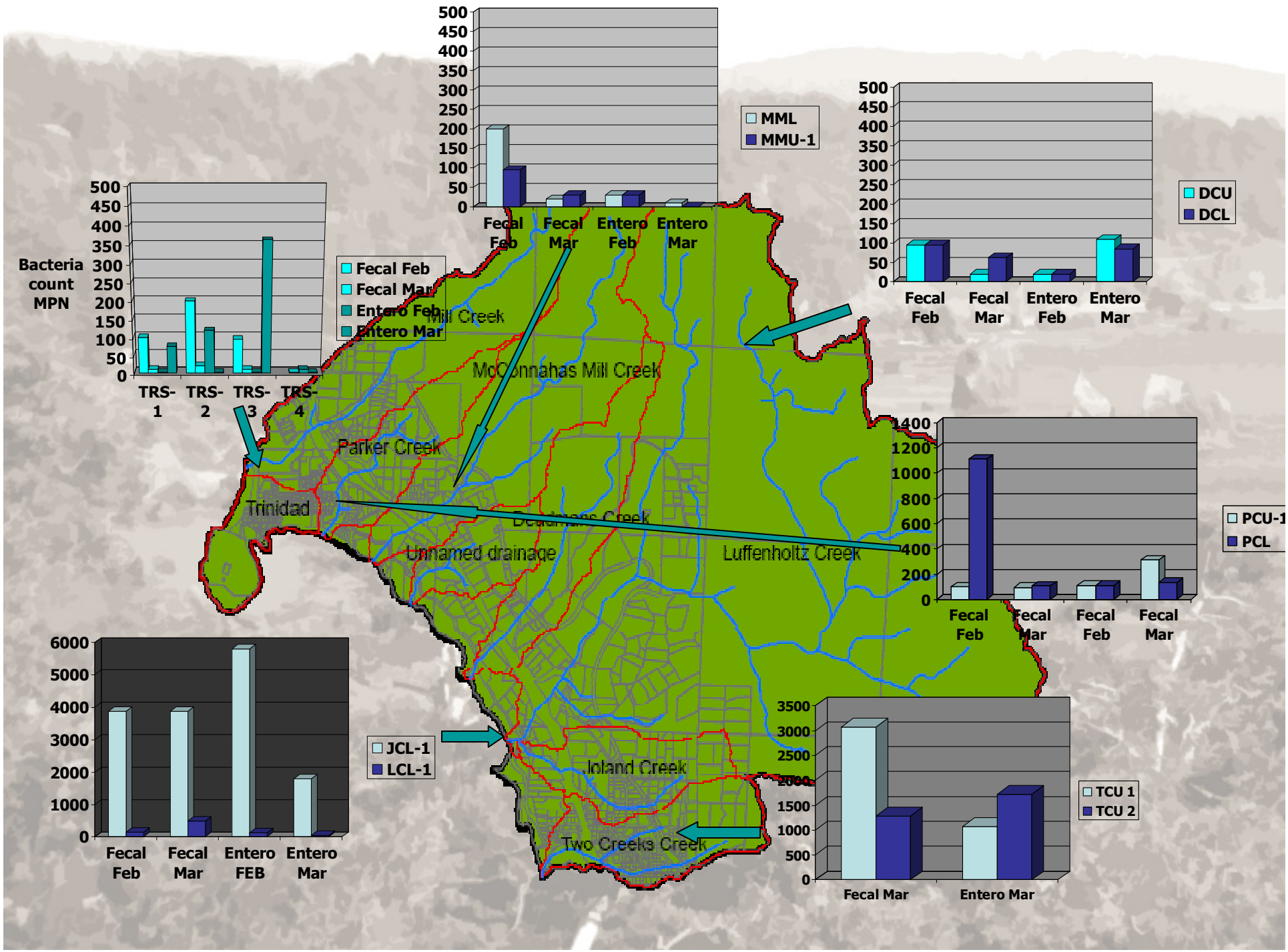



Trinidad
Kelp Beds
ASBS
1
2
3
4
5
6
7
8
LEGEND
WATERSHED
NAME
AREA (ACRES)
1 MILL CREEK 656
2 TRINIDAD 75
3 PARKER CREEK 234
4 MCCONNAHAS MILL CREEK 745
5 UNNAMED WATERSHED 150
6 DEADMAN'S CREEK 383
7 LUFFENHOLTZ CREEK 3,397
8 TWO CREEKS 266
TOTAL 6,078
BOUNDARIES
STREAM
WATERSHED BOUNDARY
PARCEL LINES
SAMPLE LOCATIONS
N
0
1500
3000
HORIZONTAL SCALE IN FEET
www.streamlineplanning.net
Streamline
Planning Consultants
City of Trinidad
PROP 50
SAMPLING LOCATIONS
Humboldt County, California

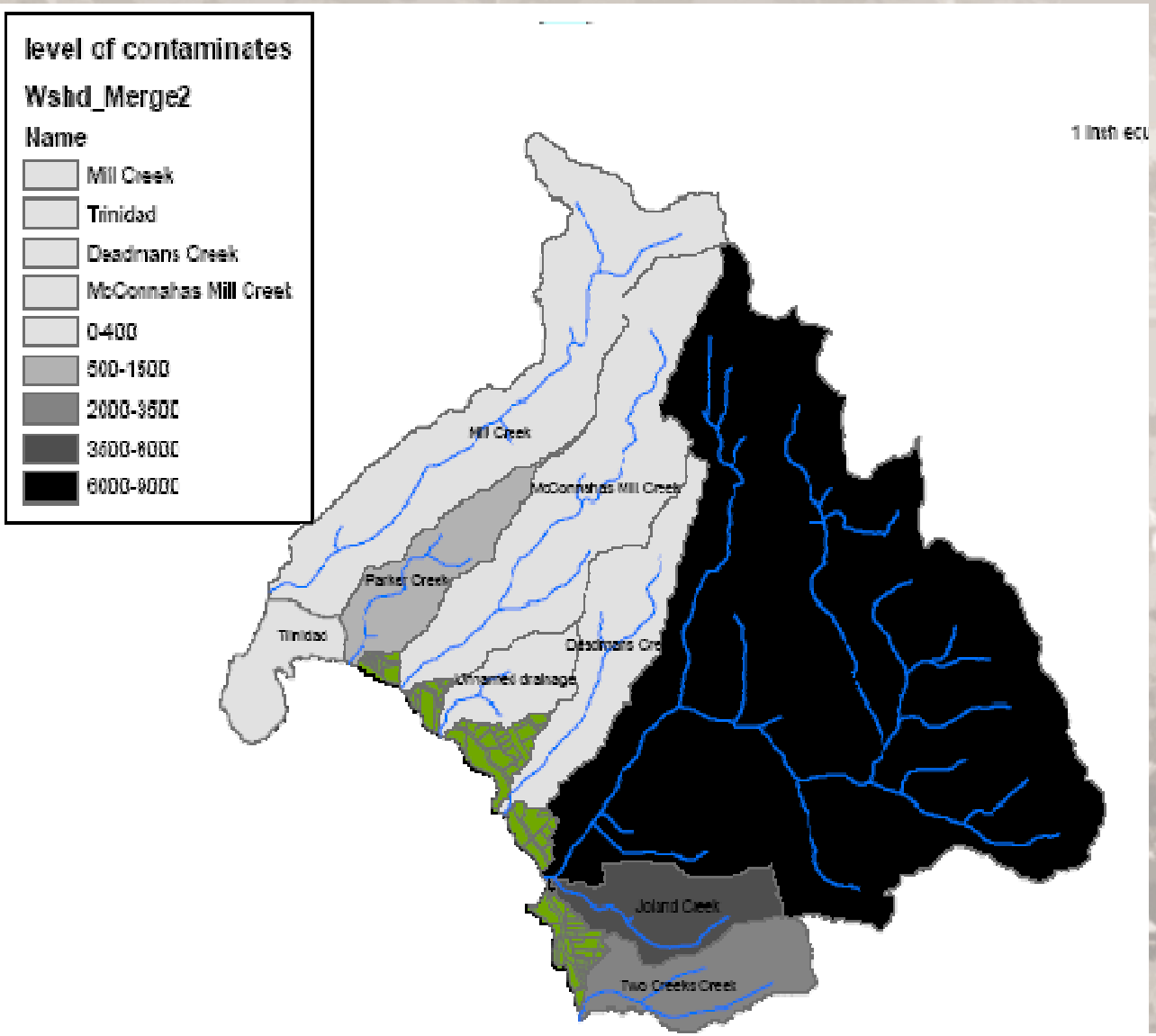

Fecal Coliform (E. coli)
Bacteria Count per 100 ml (MPN)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
4,884
3,873
3,873
3,076
Feb-07
Mar-07
Oct-07
Dec-07
Contact Recreational Standard (= 400 MPN)
TRS-1
TRS-2
TRS-3
TRS-4
TSD-1
TRW-1
TRO-1
MCL-1
MCU-1
MCU-2
MCU-S
PCL-1
PCU-1
PCU-2
MML-1
MMU-1
UCL-1
UCU-1
DCL-1
DCU-1
LCL-1
LCL-1D
LCU-1
LCU-1D
LCU-2
LCU-3
LCT-1
JCL-1
JCL-1D
JCU-1
JCU-2
TCL-1
TCU-1
TCU-2
Trinidad
Mill Creek
Parker Creek
McConnahas
Deadman's Cr.
Luffenholtz Cr.
Joland Creek
Two Creeks
Monitoring Site


Enterococcus
Bacteria Count per 100 ml (MPN)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
2,723
2,909
5,794
5,797
2,187
3,609
2,481
Feb-07
Mar-07
Oct-07
Dec-07
Contact Recreational Standard (= 104 MPN)
TRS-1
TRS-2
TRS-3
TRS-4
TSD-1
TRW-1
TRO-1
MCL-1
MCU-1
MCU-2
MCU-S
PCL-1
PCU-1
PCU-2
MML-1
MMU-1
UCL-1
UCU-1
DCL-1
DCU-1
LCL-1
LCL-1D
LCU-1
LCU-1D
LCU-2
LCU-3
LCT-1
JCL-1
JCL-1D
JCU-1
JCU-2
TCL-1
TCU-1
TCU-2
Sampling Site


E. coli Readings
10
100
1,000
Enterococcus Readings
10
100
1,000
Total Coliform Bacteria Readings
100
1,000
10,000


Bacteria count MPN
500
450
400
350
300
250
200
150
100
50
0
TRS-1
TRS-2
TRS-3
TRS-4
Fecal Feb
Fecal Mar
Entero Feb
Entero Mar
MML
MMU-1
DCU
DCL
PCU-1
PCL
JCL-1
LCL-1
TCU 1
TCU 2
Fecal Feb
Fecal Mar
Entero Feb
Entero Mar
Entero FEB
Mill Creek
McConnahas Mill Creek
Parker Creek
Trinidad
Unnamed drainage
Luffenholtz Creek
Inland Creek
Two Creeks Creek

Water Quality Exceedances Across Our Watersheds



Note the worst fecal deposits were recorded around the Westhaven area. (Lufenholtz watershed)

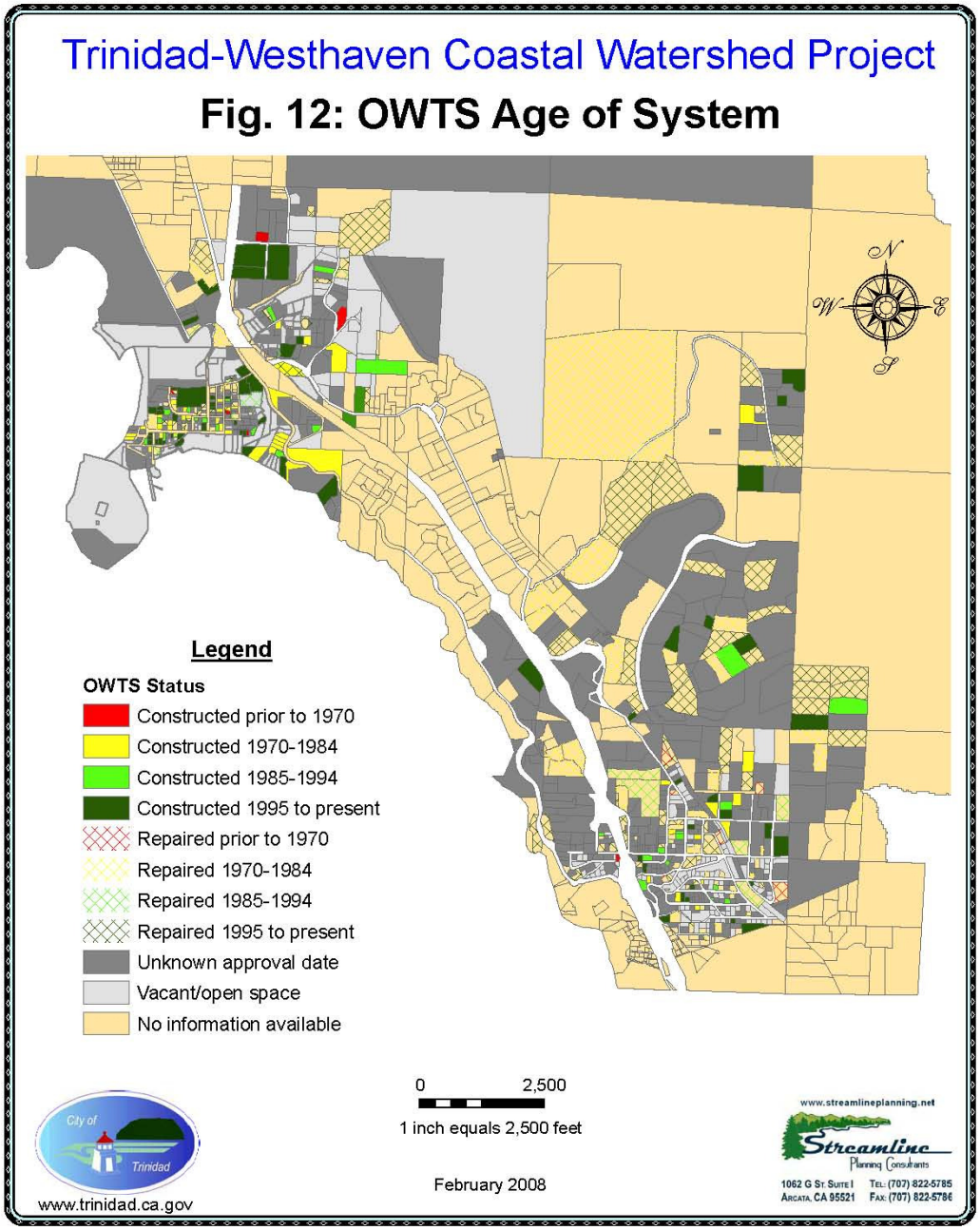
GIS Overlays

1) setbacks from creeks;
2) land use and occupancy;
3) water usage;
4) percentage impermeable surfaces;
5) macro invertebrates;
6) stream health/limiting factors
7) age and capacity of OWTS systems;
8) densities of OWTS per sub-basin;

Health Department Records

OWTS Permit Assessment:

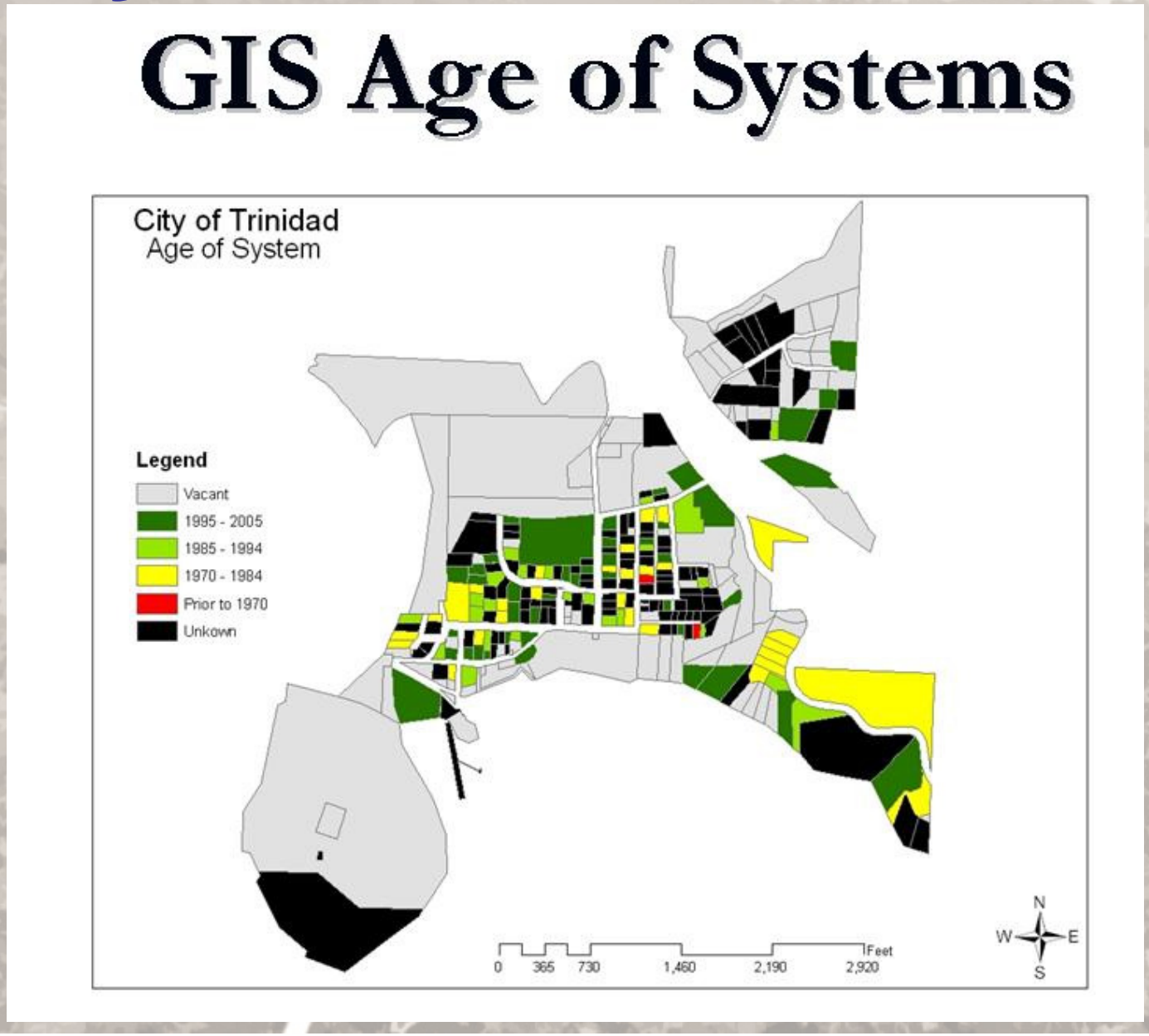
Age of Systems

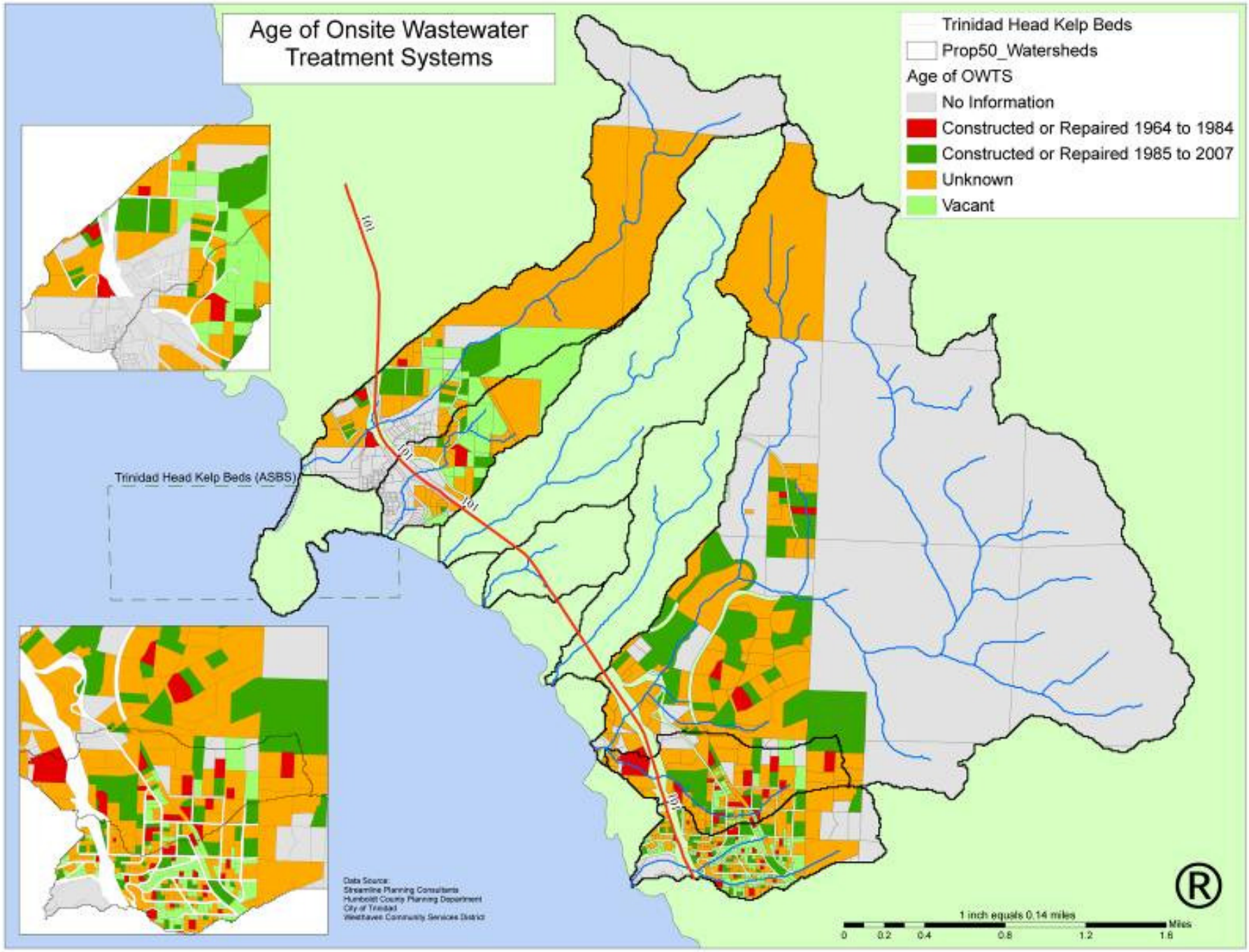


Age of Systems

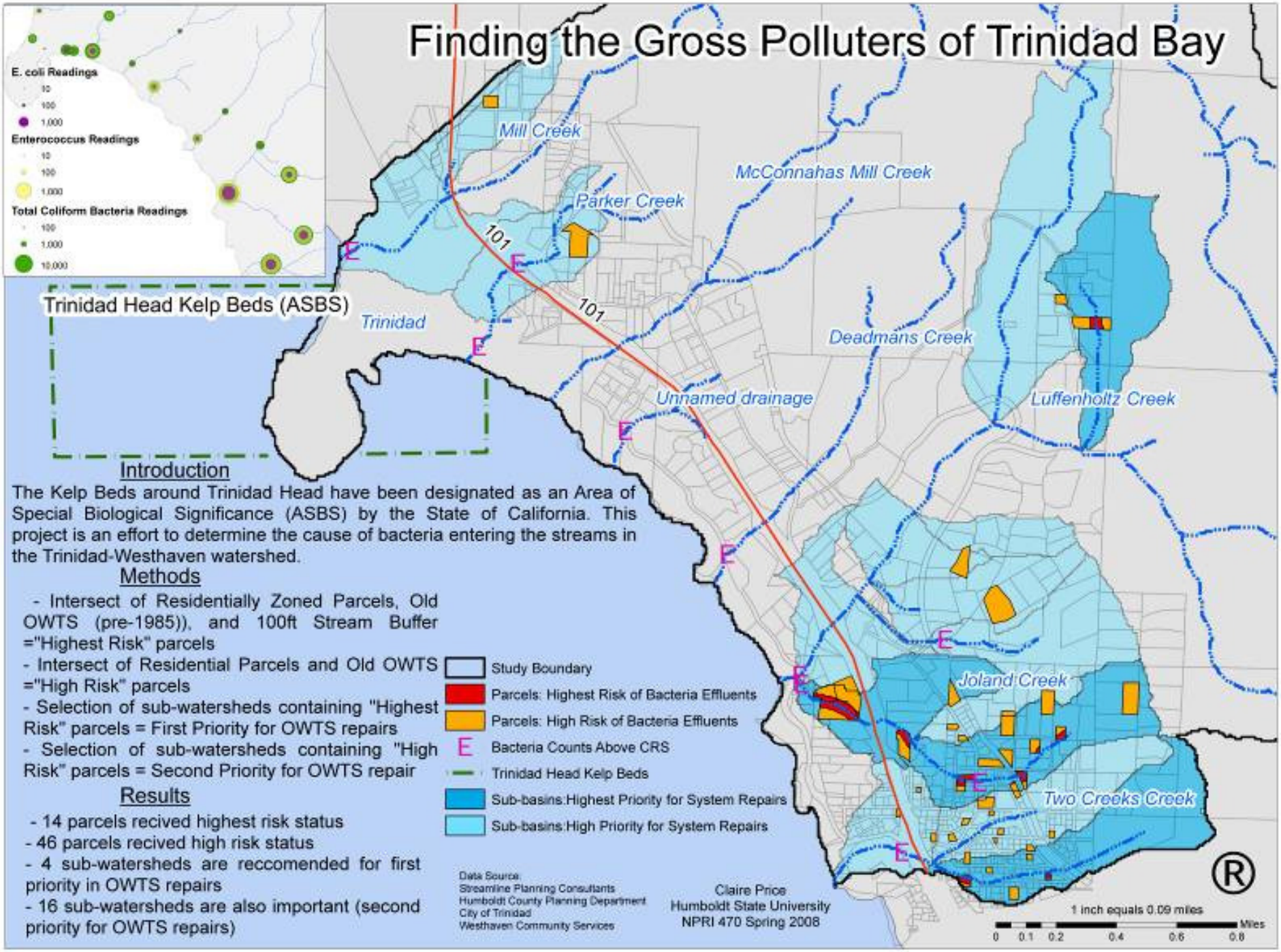
High Risk

In Black




Age of Onsite Wastewater Treatment Systems
Trinidad Head Kelp Beds
Prop50_Watersheds
Age of OWTS
No Information
Constructed or Repaired 1964 to 1984
Constructed or Repaired 1985 to 2007
Unknown
Vacant
Trinidad Head Kelp Beds (ASBS)
101
Data Source:
Streamline Planning Consultants
Humboldt County Planning Department
City of Trinidad
Westhaven Community Services District
1 inch equals 0.14 miles
0
0.2
0.4
0.8
1.2
1.6
Miles

Finding the Gross Polluters of Trinidad Bay



Introduction

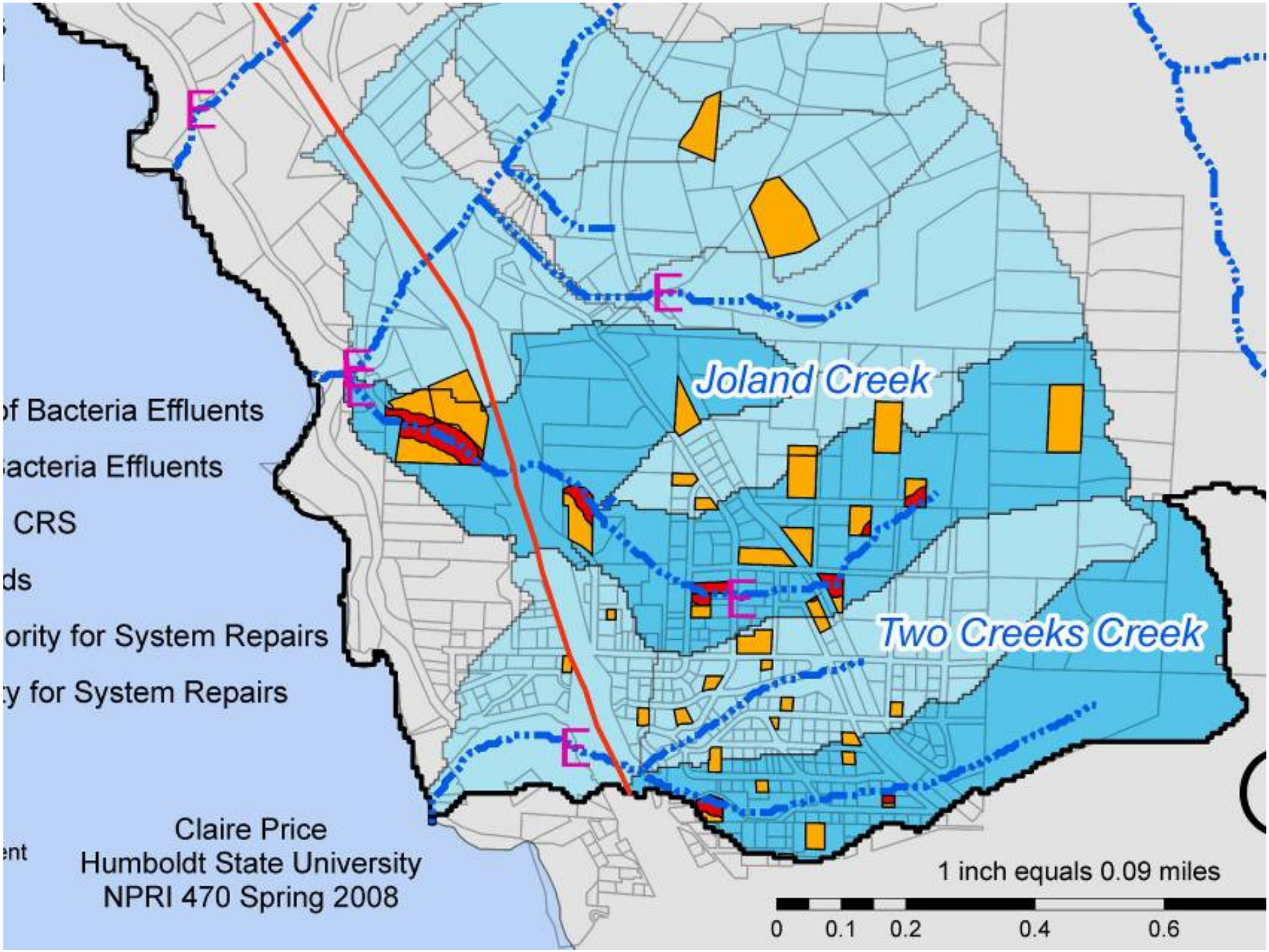
The Kelp Beds around Trinidad Head have been designated as an Area of Special Biological Significance (ASBS) by the State of California. This project is an effort to determine the cause of bacteria entering the streams in the Trinidad-Westhaven watershed.

Methods

- Intersect of Residentially Zoned Parcels, Old OWTS (pre-1985)), and 100ft Stream Buffer ="Highest Risk" parcels
- Intersect of Residential Parcels and Old OWTS ="High Risk" parcels
- Selection of sub-watersheds containing "Highest Risk" parcels = First Priority for OWTS repairs
- Selection of sub-watersheds containing "High Risk" parcels = Second Priority for OWTS repair

Results

- 14 parcels recived highest risk status
- 46 parcels recived high risk status
- 4 sub-watersheds are reccomended for first priority in OWTS repairs
- 16 sub-watersheds are also important (second priority for OWTS repairs)


f Bacteria Effluents
acteria Effluents
CRS
ds
ority for System Repairs
y for System Repairs
Joland Creek
Two Creeks Creek
Claire Price
Humboldt State University
NPRI 470 Spring 2008
1 inch equals 0.09 miles
0
0.1
0.2
0.4
0.6

Color Infrared Digital Aerials

Trinidad

Trinidad Ordinance Provisions

- Performance Inspections
- Operating Permits: 3-5 years
- Maintenance Requirements to Renew Operating Permits
- Enforcement

This is one of the reasons why we need to clean up our creeks

Warning!

Ocean and Creek Water Contact May Cause Illness!

Bacteria Levels Exceed Health Standards.

Ocean swimmers should stay a minimum of 50 yards away from creek mouth. Do not wade or swim in the creek.

Contact Humboldt County Division of Environmental Health for further information at (707) 445-6215 or 1-800-963-9241

A Significant Issue Nationally

25% of homes use onsite treatment

(33% of new construction)

>50% more than 30 years old

50% in suburban areas

10-20% fail each year

2nd highest threat to groundwater

CA OWTS Tax Credit

- Statewide application
- Can provide an incentive to fix old systems
- Can provide immediate WQ benefits
- Contact me afterwards if you represent an agency or association that may support such a proposal.

Project Contact Information

Trinidad ICWMP

- **Mayor Chi Wei Lin**

www.trinidad.ca.gov

WINZLER&KELLY

- **Steven Allen, P.E. Project Engineer**
  steveallen@w-and-k.com
- **Rebecca Crow, P.E. Project Participant**
  rebeccacrow@w-and-k.com

www.w-and-k.com

- **Bob Brown, AICP**
  bob@streamlineplanning.net

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