

Guadalupe River above Canyon Lake TMDL Implementation Project



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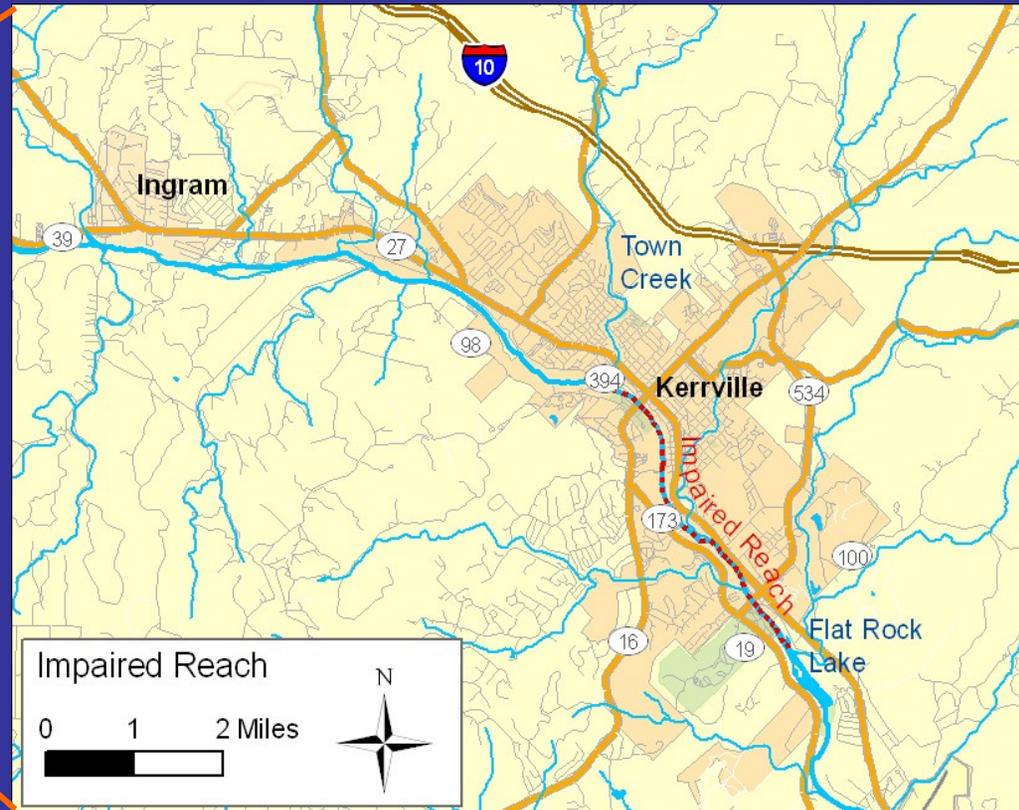
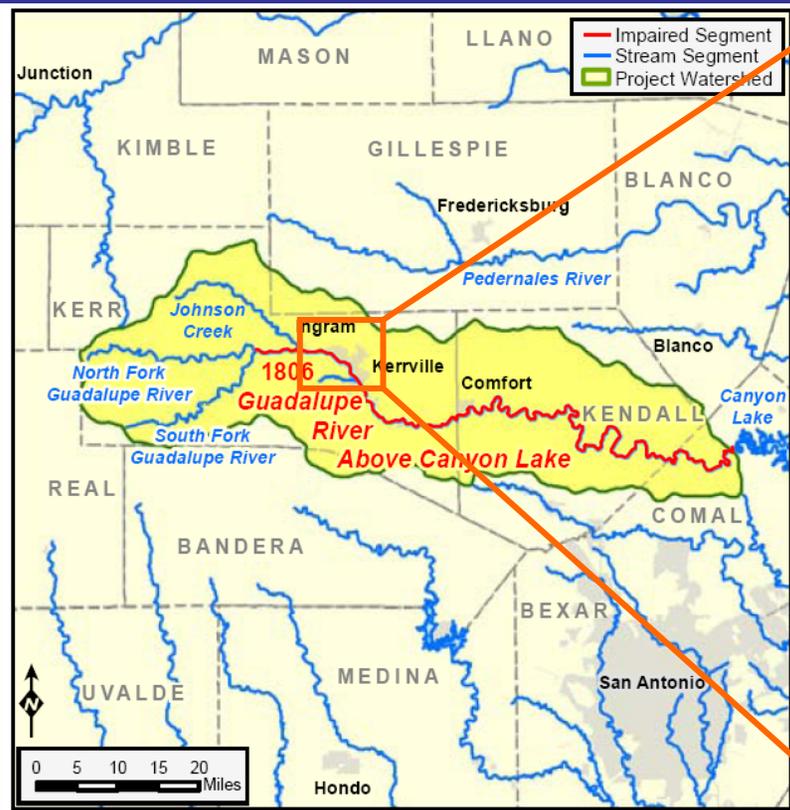
Guadalupe River above Canyon Lake TMDL

- Bacteria impairment for contact recreation in a 3.5 mile reach of Guadalupe River in Kerrville
- TCEQ adopted TMDL in July 2007
- EPA approved TMDL in September 2007
- In 2008 UGRA and TCEQ initiated a three year project to address the impairment

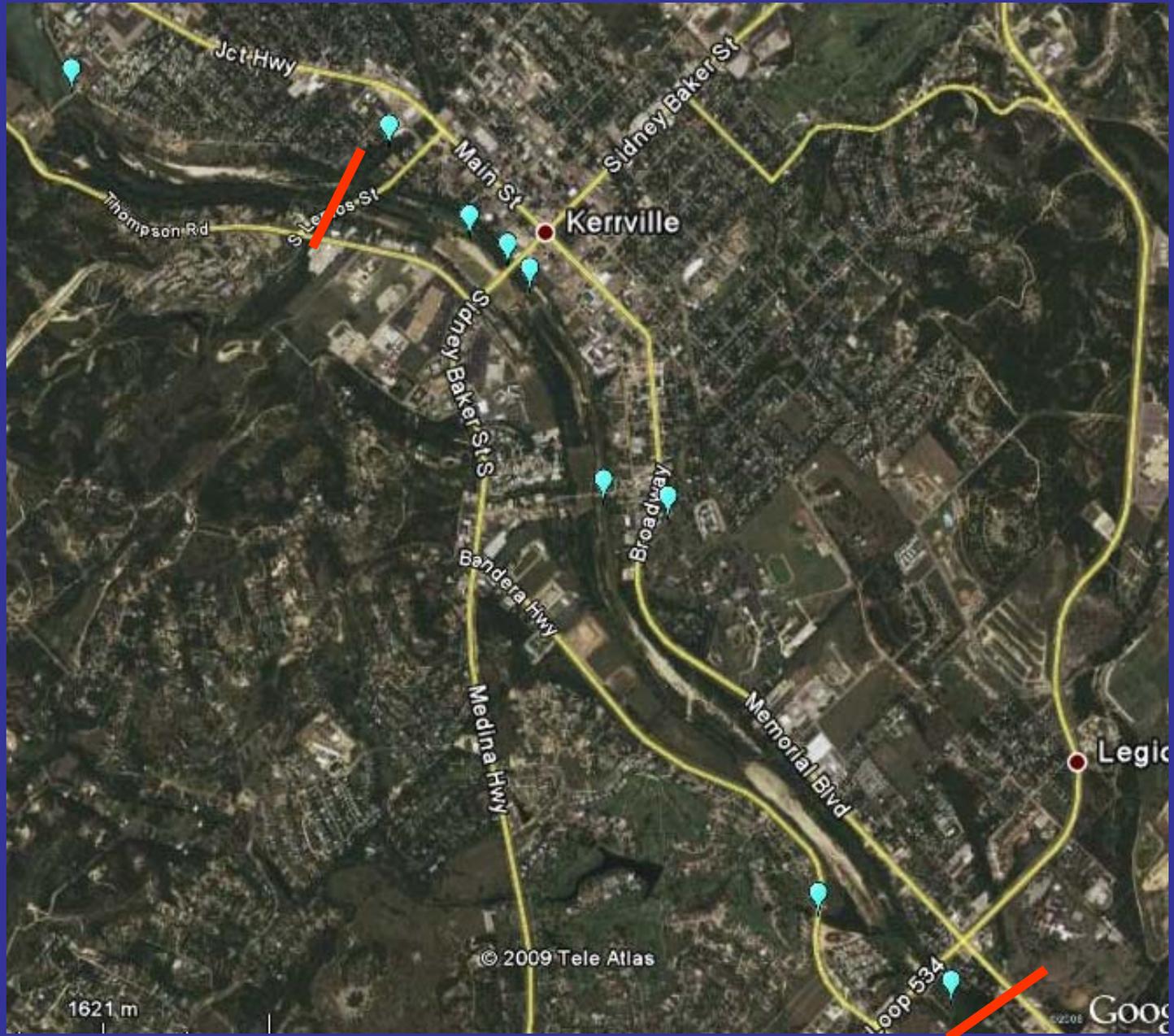
Key Components

- Monitoring
- Technical Analysis of Control Measures
- Stakeholder Guidance
- Development of Action Plan

Impaired Area



Monitoring Plan



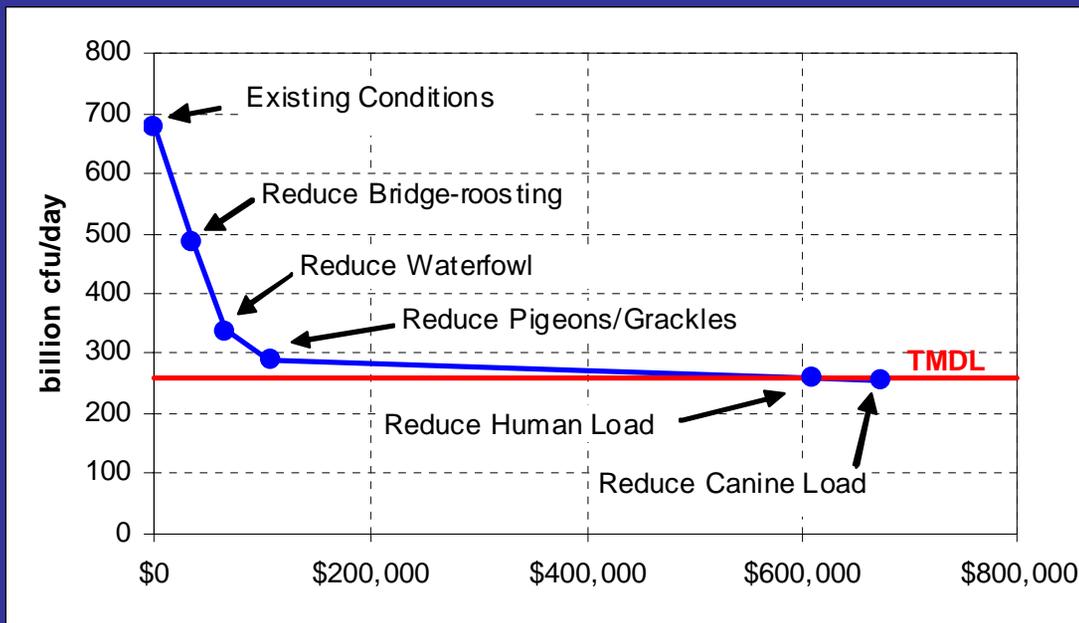
Sampling Results (Seasonal)

Station	July 08 - Sept 08	Oct 08 - Feb 09
12618 (UGRA Lake)	6	11
16244 (L Hays Park Footbridge)	131	106
12617 (L Hays Park, Hwy 16)	216	55
16243 (L Hays Park Dam)	129	51
12616 (G Street)	82	32
12615 (Kerrville Schreiner Park)	106	81

- Typical flows (median of sampling days) were similar in Summer (43 cfs) and Winter (50 cfs)
- 2008 *E. coli* concentrations were generally lower than those from the TMDL study.

Cost-Effectiveness of Key BMPs

Source	BMPs	20-Year Cost	Load Reduction (10 ⁹ cfu/day)	10 ⁶ cfu/day/\$
Swallows & Pigeons (bridge-roosting)	exclusion devices on bridges (above water)	\$35,000	195	5.57
Waterfowl	trapping and removal, bird feeding advisory	\$31,500	150	4.76
Pigeons & Grackles (wading)	trapping and removal, bird feeding advisory	\$40,400	46	1.14
Human	rehabilitation of sewer/lateral deficiencies	\$500,000	30	0.06
Dogs	install stations at public parks, encourage pet waste clean-up	\$65,000	3	0.05



Stakeholder Group

- Representatives from 16 organizations
 - Local Government Entities
 - State Agencies
 - Businesses
 - Homeowners Associations
 - Conservation Groups

Stakeholder Roles

- Provide a locally-driven solution
- Suggest possible sources of bacteria
- Inform, educate, and receive feedback from the general public
- Select and prioritize control measures
- Implement control measures (often with state assistance)

Implementation Measures

- Install bird deterrents and exclusion devices
- Remove waterfowl from Louise Hays Park and Kerrville Schreiner Park
- Public education to emphasize watershed stewardship, including pet waste cleanup and reduced bird feeding
- Install pet waste disposal stations at City Parks
- Trap and remove pigeons and grackles from City Parks and adjacent streets
- Homeowner septic system education

