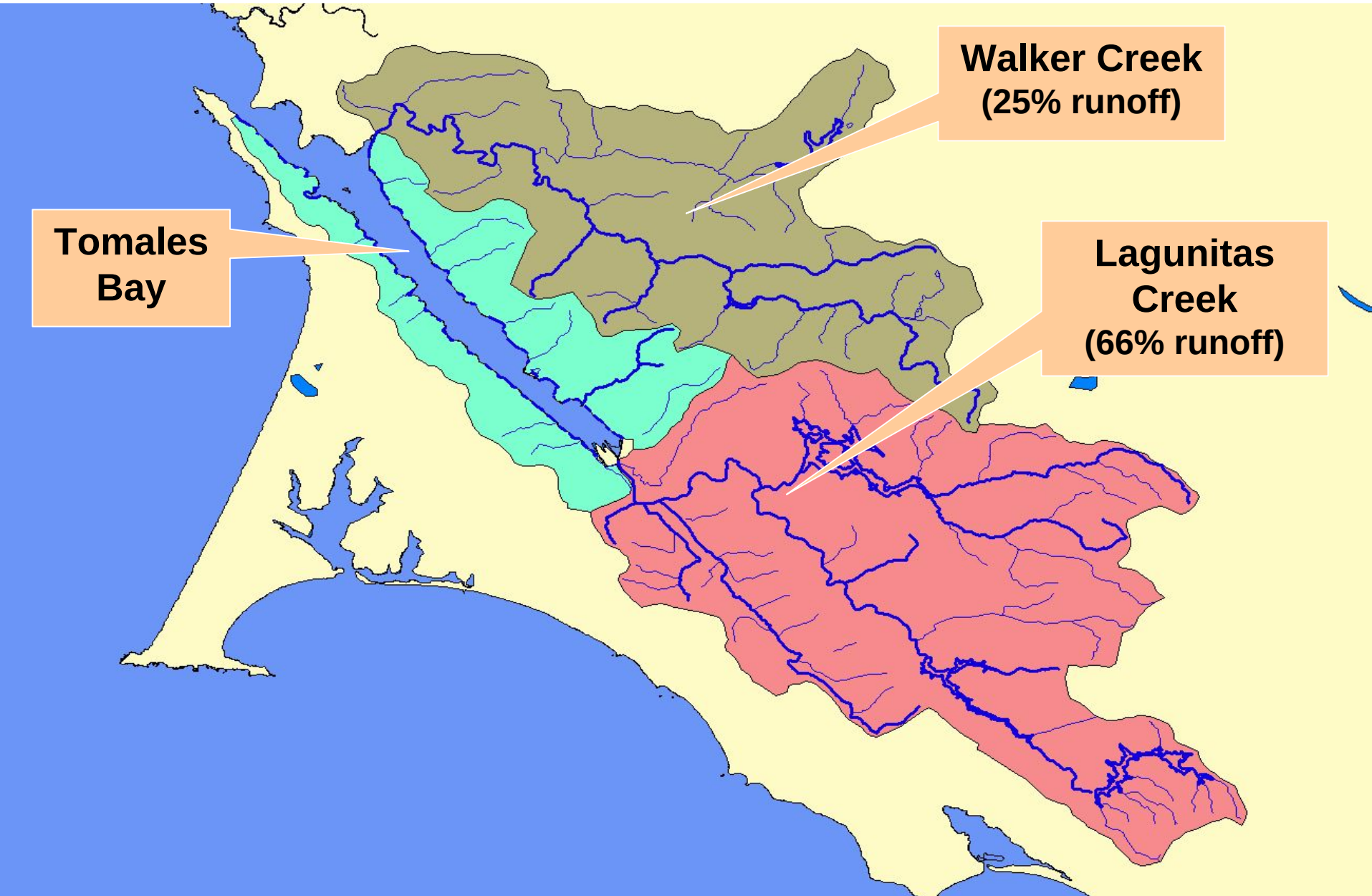
Tomales Bay Watershed Pathogen TMDL

Adopted on September 21, 2005

Tomales Bay and its Main Tributaries



Tomales Bay and its Tributaries Do Not Fully Support Beneficial Uses

- **Water contact recreation** (REC-1)
- **Non-contact water recreation** (REC-2)

- **Shellfish harvesting** (SHELL)
  - *~70 closure days/year*
  - *1998 illness outbreak*
  - *Human virus origin*

Water Quality Targets

- **Zero Discharge of Human Waste**

  consistent with existing Basin Plan waste discharge prohibition

- **Shellfish Harvesting Closures < 30 days a year**

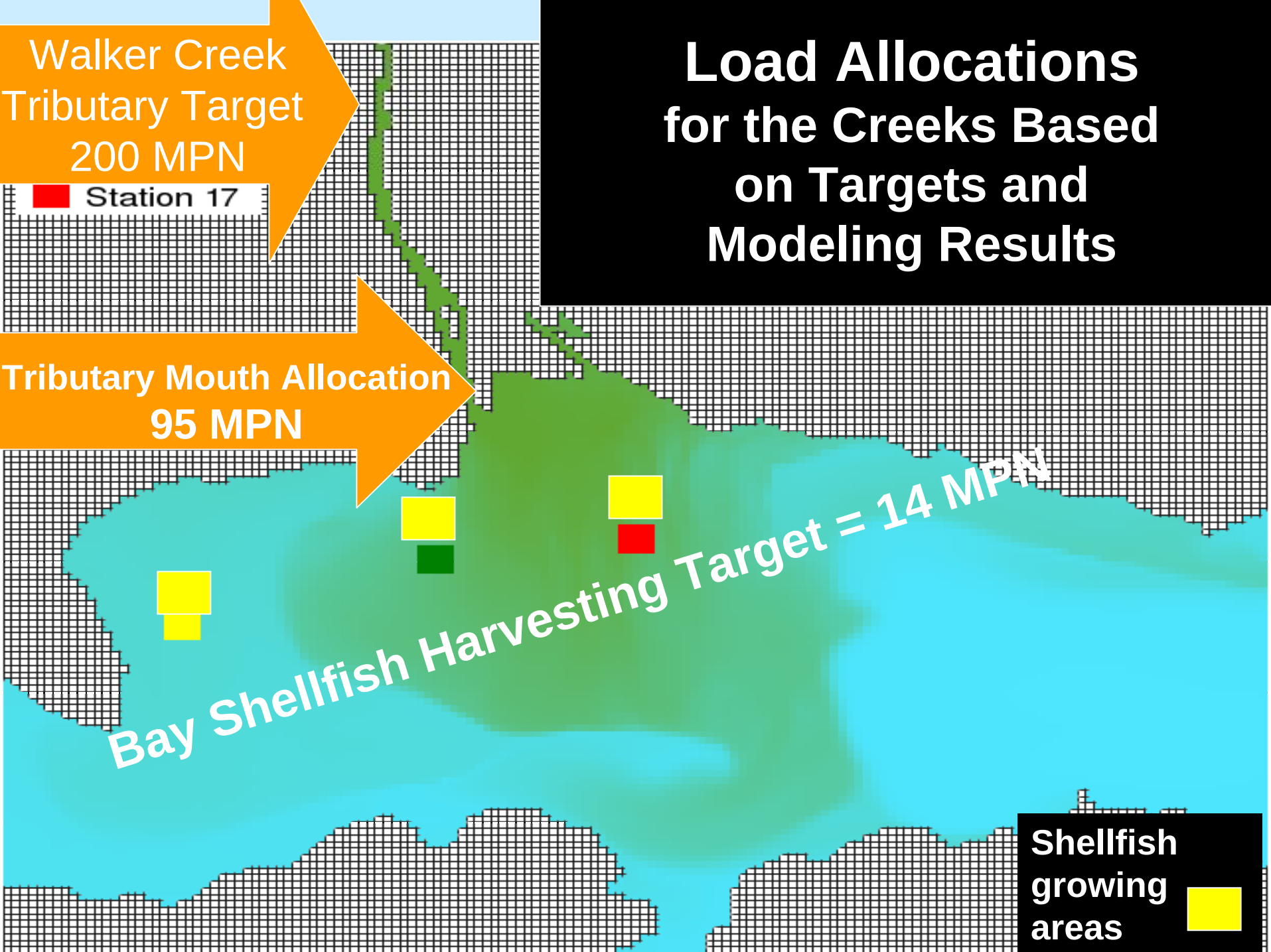
  consistent with the California Shellfish Protection Act

- **Fecal Coliform Bacteria Targets for Animal Waste** **as Most Probable Number / 100 mL water (MPN):**

  Tributary Target **protects recreational uses:**
  Log mean < 200, 90th Percentile < 400

  Tomales Bay Target **protects shellfish harvesting:**

  Median < 14, 90th Percentile < 43


Walker Creek
Tributary Target
200 MPN
Station 17
Load Allocations
for the Creeks Based
on Targets and
Modeling Results
Tributary Mouth Allocation
95 MPN
Bay Shellfish Harvesting Target = 14 MPN
Shellfish
growing
areas

Potential Pathogen Sources

Human Sources

- Septic systems
- Boat discharges
- Sewage treatment facilities

Animal Sources

- Animal agriculture
  - Dairies
  - Grazing lands
  - Equestrian facilities
- Municipal runoff (pet waste)
- Wildlife

Public Comments
April 2006

- Targets and allocations are too stringent, and not attainable due to wildlife sources
- Sources have not been adequately identified and quantified
- Wildlife are the problem
- Microbial Source Tracking (MST) should be used to distinguish sources

Comment:

Numeric targets and allocations are too stringent, and not attainable due to wildlife sources.

Response:

- The numeric targets are identical to the Basin Plan objectives and DHS standards set to protect the beneficial uses.
- Dischargers are responsible for complying with the Implementation Plan, not directly with targets.

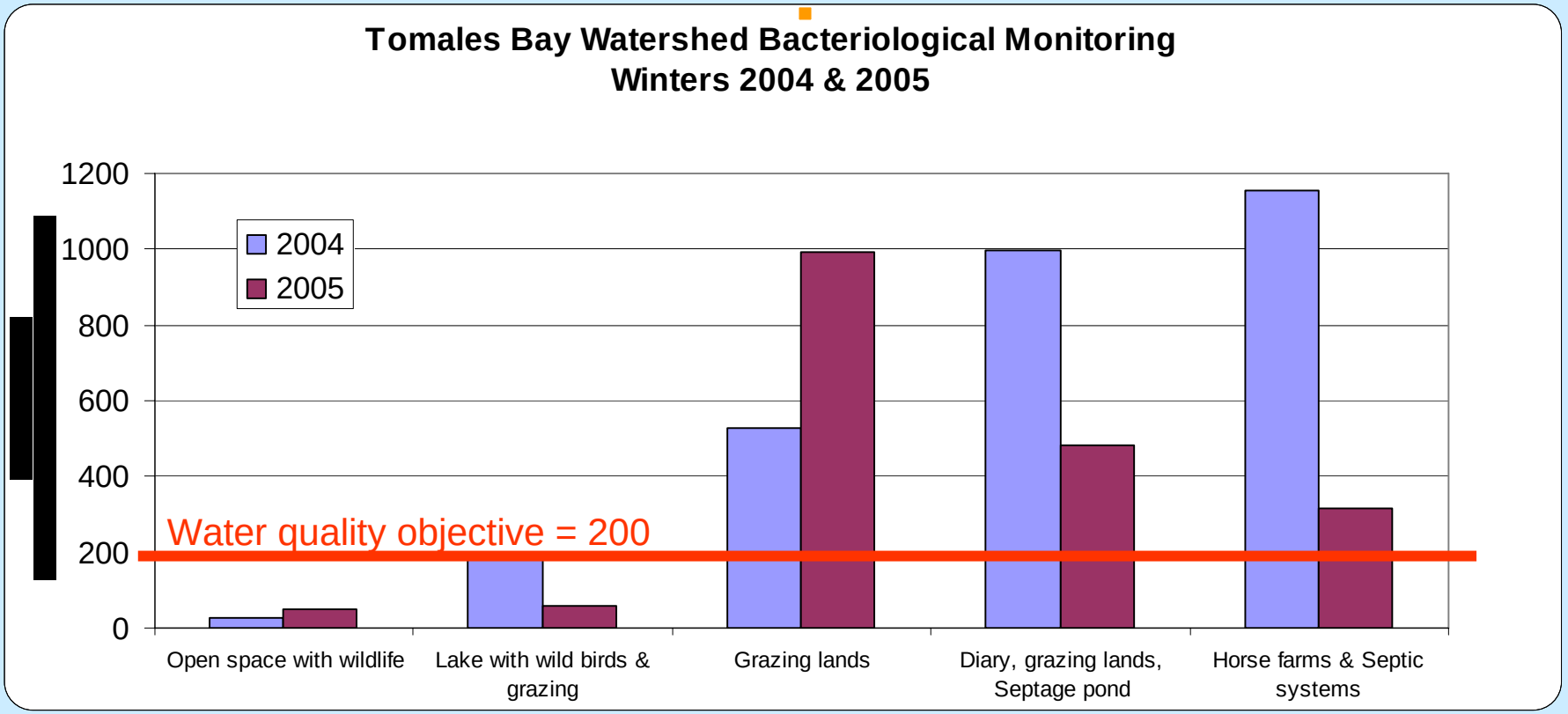
Comment:

Sources have not been adequately identified and quantified.

Response:

- Several well-researched studies have been performed measuring fecal coliform concentrations and loadings downstream from various sources in the watershed as well as in Tomales Bay itself.
- These studies show that the majority of the tributary load is probably coming from **cattle** (a major land use in the watershed).

Identification of Sources: Elevated Fecal Coliform Bacteria Concentrations Detected Downstream



Comment:

Wildlife (seals, birds, elk) are the problem.

Response:

- Tomales Bay is well below targets during non-rainy periods where seals and birds are present.
- Wildlife-only watersheds with elk have much lower pathogen concentrations.

Bay Wildlife Are Not a Significant Source

On Non-Rainy Days Bay Meets Water Quality Standards

Fecal coliform data for shellfish growing areas in Tomales Bay (Geometric Mean)				
Sample Site	No. of Samples	2003	2002	2001
WQ Station # 1	30	3.4	3.9	3.3
WQ Station # 2	30	3.8	3.3	4.5
WQ Station # 4	30	2.4	2.7	2.7
WQ Station # 6	30	2.6	2.9	4.3
WQ Station # 7	30	2.5	2.9	3.5
WQ Station # 9	30	4.8	4.1	4.4
WQ Station # 10	30	4.3	3.7	4.2
WQ Station # 11	30	4.4	4.3	5.6
WQ Station # 12	30	2.4	2.4	2.8
WQ Station # 31	30	4.0	4.1	3.9
WQ Station # 32	30	3.7	4.7	5.5
WQ Station # 33	30	3.1	3.1	3.3
WQ Station # 38	30	2.7	2.9	3.4
WQ Station # 39	30	2.9	3.8	3.8
WQ Station # 40	30	4.1	4.7	4.0
WQ Station # 41	30	5.0	5.1	3.8
WQ Station # 47	30	5.1	5.1	3.5

Comment:

Microbial Source Tracking (MST) should be used to distinguish sources.

Response:

- Sources are already well-identified.
- MST is currently expensive, time-consuming, and inaccurate.
- Will consider as part of adaptive management.

Implementing the TMDL