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# Agua Hedionda Watershed Management Plan

**Watershed Planning Group Meeting**
**November 15, 2007**
**Carlsbad, CA**

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## Stream Characterization

*Mapping Update*
*Water Quality Assessment*
*CRAM Findings*
*Stream Characterization*

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## How will this be used?

- **Develop**
  - ✓ understanding of existing conditions.
  - ✓understanding of processes at work in the watershed.
  - ✓ inputs for and interpretation of the watershed model.
- **Identify priority restoration and preservation sites.**

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## Mapping Update

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***Ecology***

- Does the *Invasive Species* map show populations before or after eradication efforts?
- The *Vegetation Community* map seems out of date.
- Let's show areas adjacent to the watershed for ecological maps.

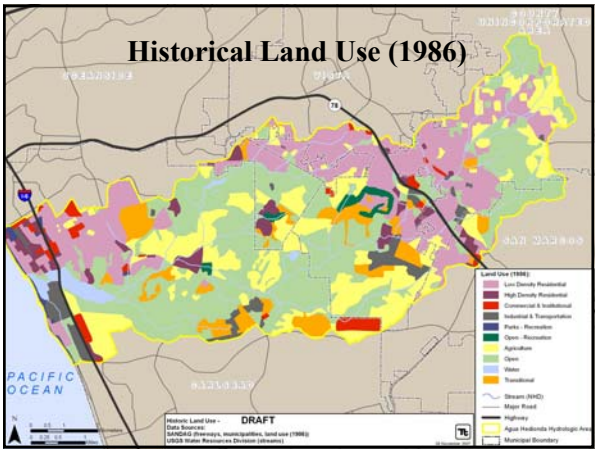
***Current Land Use & Recent Developments***

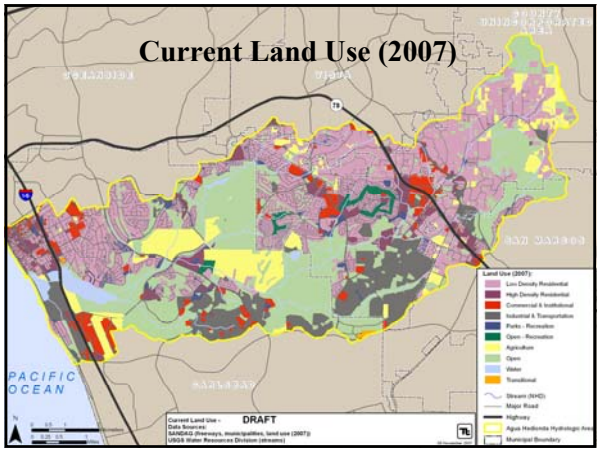
- The *Current Land Use* map does not include recent developments in the watershed.
- It would be useful to compare historical with current land use in the watershed.
- Are more recent aerial imagery data available?

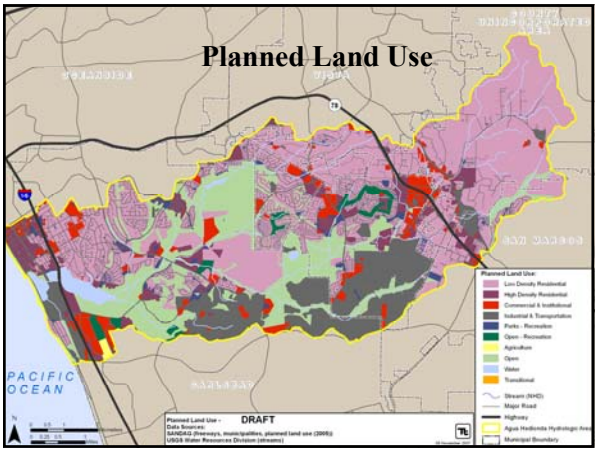
***Impervious Surfaces***

- How does Agua Hedionda compare to neighboring watersheds' % imperviousness?
- Can we generate finer sub-basins to present the % impervious data within the watershed?
- Are more recent % impervious data available?

## Historical Land Use (1986)

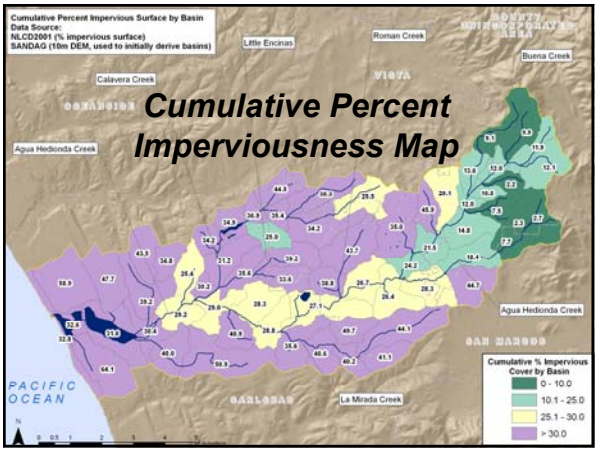


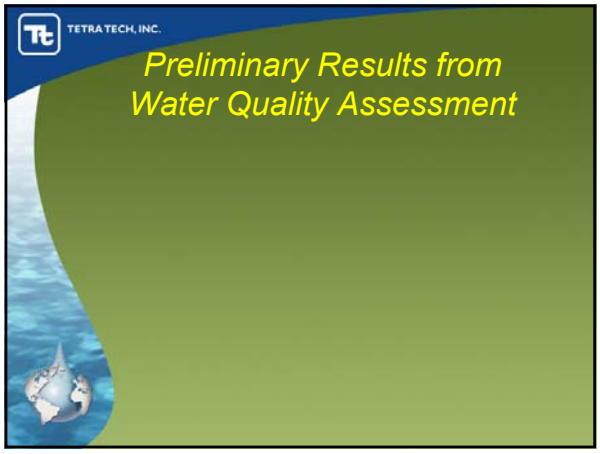



**Percent of watershed comprised of each land use class for past, current, and planned land use.**

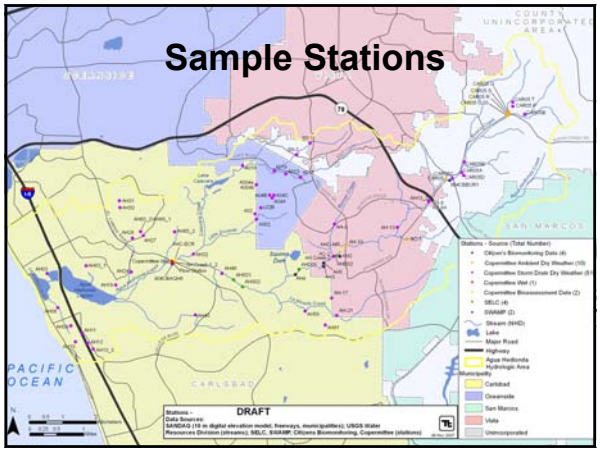
| Land Use Classes | Past (1986) | Current (2007) | Planned |
|---|---|---|---|
| Low Density Residential | 25.03 | 29.87 | 42.82 |
| High Density Residential | 3.51 | 3.90 | 5.73 |
| Commercial & Institutional | 2.24 | 4.09 | 5.38 |
| Industrial & Transportation | 4.19 | 19.55 | 23.05 |
| Parks - Recreation | 0.58 | 1.65 | 1.78 |
| Open - Recreation | 1.03 | 1.05 | 1.50 |
| Agriculture | 19.16 | 8.53 | 0.18 |
| Open | 36.52 | 29.71 | 18.02 |
| Water | 1.53 | 1.53 | 1.54 |
| Transitional | 6.21 | 0.12 | 0.00 |




## *Data Sources*

| Agency/Organization | Number of Sites | Years Covered | Water Quality | Water Chemistry | Bacteriological | BMI | Toxicity | Physical Habitat | Rain Gauge | Flow | Discharge |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Copermitte Dry Weather (ambient & storm drain) | 61 | 2002-2007 | X | X | X | | | | | | |
| Copermittee Wet Weather | 1 | 1998 - 2007 | X | X | X | | X | | X | | |
| Copermittee Bioassessment Data | 2 | 2002 - 2006 | | X | | X | | X | | | |
| Citizen's Biomonitoring Data | 4 | 2001, 2002, 2003, 2005, 2007 | | X | | X | | X | | | |
| San Elijo Lagoon Conservancy | 4 | 2004 - 2006 | X | X | X | X | | X | | X | X |
| SWAMP | 2 | 2002 | X | X | | | X | X | | | |

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# Data Summary

**Water Chemistry**

- Increasing trends were found for total suspended solids, conductivity, turbidity, COD, ammonia, fecal coliforms, total coliforms, and enterococcus, nitrate (Copermittee Wet Data, Copermittee Dry Weather)
- Both Buena and Agua Hedionda Creeks had aquatic life exceedences for Ammonia as N, sulfate, dissolved manganese, pH, and specific conductivity (SWAMP data)
- The San Elijo Lagoon Conservancy Data found elevated levels of fecal coliforms and enterococcus.

**Metals**

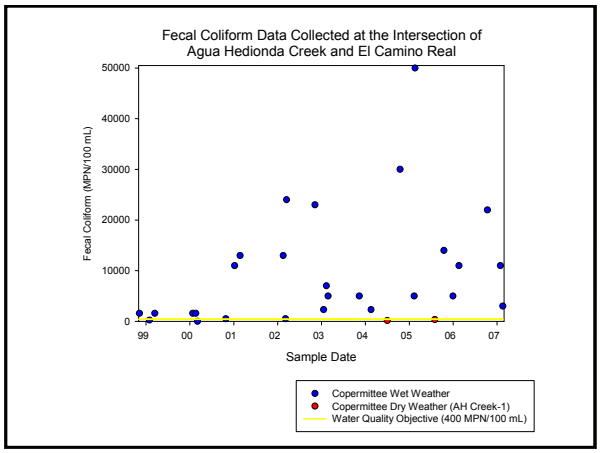
- Total lead showed an overall increasing trend (Copermittee Wet Data)

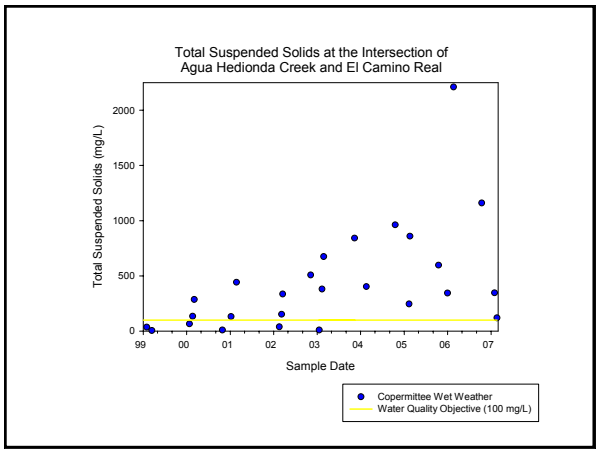
**Pesticides**

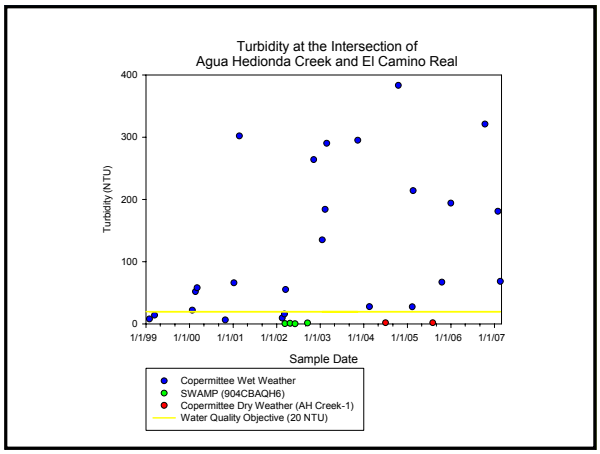
- Malathion, Chlorpyrifos, and Diazinon have exceeded WQO (Copermittee Wet Data)
- Agua Hedionda Creek exceeded human health levels for the pesticide DDE and Buena Creek showed exceedances for aldrin, DDD, DDE, DDT, and Dieldrin (SWAMP data)

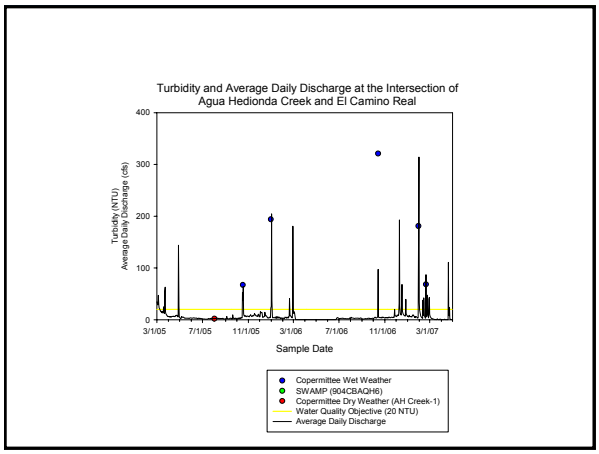
**BMI**

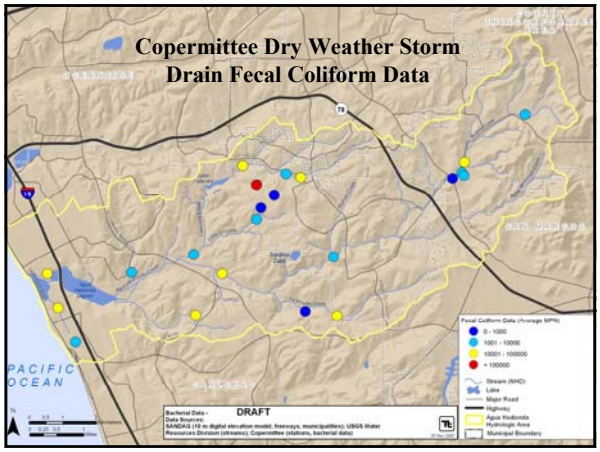
All San Elijo Lagoon Conservancy sites were considered 'impaired' using the Southern California Index of Biotic Integrity (IBI).



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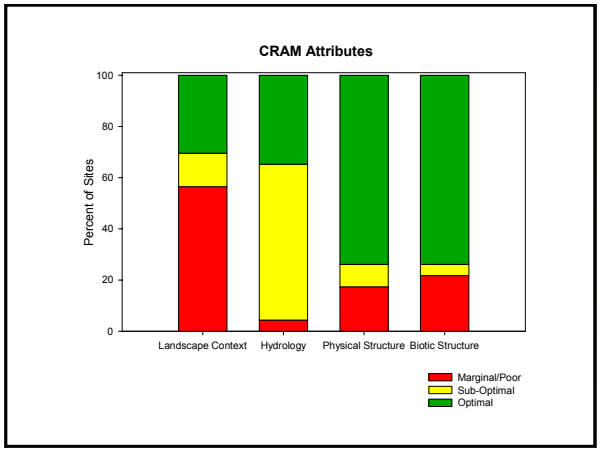
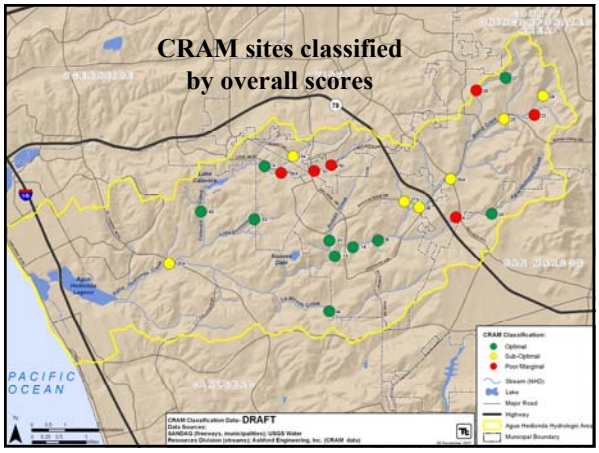
## California Rapid Assessment Method (CRAM) for Wetlands Findings

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## Watershed-wide Reconnaissance & Stream Characterization Results

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## Stream Characterization

- **Two-tier Approach**

✓General Watershed-wide Reconnaissance

- Joint Stakeholder and Tetra Tech Effort Conducted Saturday September 29th

✓Targeted Stream Reach Characterization

- Conducted by Tetra Tech staff early October

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## Watershed-wide Reconnaissance

- **Objectives –**
  - ✓Facilitate communication
  - ✓Develop understanding of the variety of impacts to stream channels throughout the watershed – NOT to collect detailed information at only a few sites
  - ✓Map the distribution of impacts

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## Stream Reach Characterization

- **Objectives –**
  - ✓Develop understanding of the extent, magnitude, and range of instream erosion and sedimentation impacts
  - ✓Identify high value aquatic resources
  - ✓Identify candidate reaches for management measures

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## Stream Reach Characterization

- **How Was Collected Data Used?**

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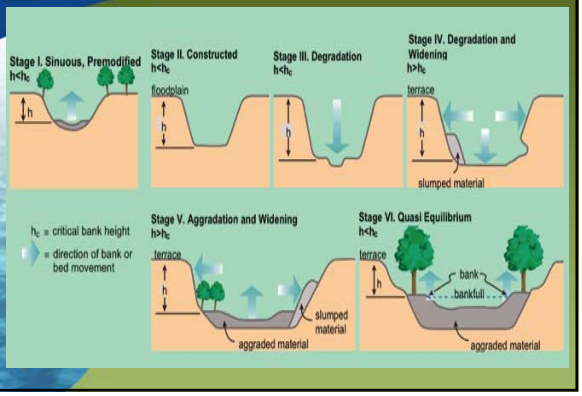


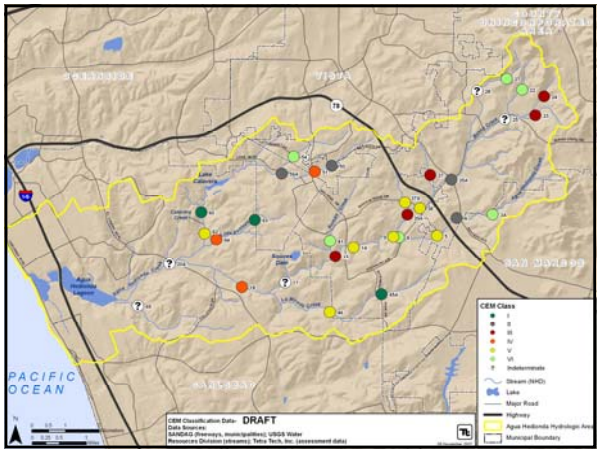


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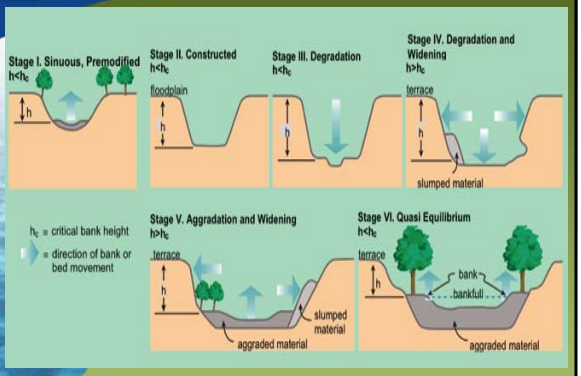


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## *Linkage to WMP Development*

- **WMP Objectives**
  - ✓*Maintain stable stream banks to protect aquatic habitat and priority tree species*
  - ✓*Design and construct restoration projects to minimize impacts to streambanks and riparian areas.*
- **Targeting of Management**
  - ✓Instream measures must be coupled with upland controls and policy

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## *Questions and Discussion*


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## ***Goals, Objectives, and Indicators***

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## *Why important now?*

- **Guides watershed plan.**
- **Context for**
  - ✓Assessing current and future conditions.
  - ✓ Evaluating and selecting management strategies.
  - ✓ Prioritizing restoration and preservation sites.

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## *Why important in the future?*

- **Track trends.**
- **Measure progress and success.**

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## *Goals, Objectives and Indicators…*

- **Developed based on your discussions**
- **Refined since last meeting based on**
  - ✓ stream characterization
  - ✓ survey of regulations

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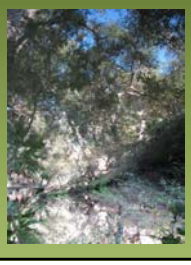
## *Goal #1*

- *Land use and infrastructure are designed so as to minimize impacts on the watershed.*



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## *Goal #1 Objectives*

- *A) Design/construct infrastructure minimizing impacts*
- *B) Design/construct new development minimizing impacts*

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## *Goal #1 Indicators*

- *Nutrient and sediment loading (to streams and Agua Hedionda Lagoon)*
- *Aquatic habitat condition*
- *Stream stability*
- *Peak Flows*
- *Flood elevation*

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## *Goal #1 Indicators*

- *Planned transportation projects & utility expansions*
- *Impervious area*
- *% of development with LID controls*
- *% of development controlled by BMPs*

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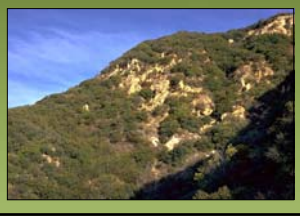
## Goal #2

- *Protect, restore and enhance habitat in the watershed.*



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## Goal #2 Objectives

- *Protect and expand open space.*
- *Protect, enhance, and restore terrestrial habitat.*
- *Provide riparian habitat for wildlife.*
- *Provide open space connectivity.*

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## Goal # 2 Objectives

- *Maintain stable stream banks to protect aquatic habitat and priority tree species.*
- *Maintain instream habitat to support native aquatic life.*
- *Maintain and protect lagoon habitat.*

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## Goal #2 Indicators

- Terrestrial habitat extent and connectivity.
- Invasive species extent.
- Riparian habitat extent and connectivity.
- Priority communities extent.
- Location of priority tree species.
- Unprotected terrestrial/riparian habitat.

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## Goal #2 Indicators

- Stream stability.
- Peak flow.
- Aquatic habitat condition.
- Aquatic biodiversity.
- Lagoon habitat quality.

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## Goal #3

- *Use a balanced approach to restore watershed functions, including hydrology, water quality, and habitat.*

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## Goal # 3 Objectives

- *Restore and protect beneficial watershed functions and uses.*
- *Design and construct restoration projects to minimize impacts to*
  - ✓ ***Streambanks***
  - ✓ ***Riparian areas***
  - ✓ ***Wildlife habitat***

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## Goal #3 Indicators

- Goal 2 habitat indicators
- Recreation areas (location, use, potential impacts)
- Preservation of flood attenuation functions.

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## Goal #4

- *Support compliance with regional, state, and federal regulatory requirements* applicable to the watershed

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## Goal #5

- *Increase awareness and stewardship within the watershed, including encouraging policy makers to develop policies that support a healthy watershed.*
- Objectives to be determined.

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## *Questions and Discussion*

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## Next Steps

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## *Watershed Assessment*

- Complete Water Quality Assessment Report.
- Complete Regulatory Review Report.
- Develop model inputs for
  - ✓ **Baseline conditions**
  - ✓ **Predevelopment conditions**
  - ✓ **Future condition.**
- Conduct modeling.
- Identify/summarize management needs.

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## *Next Meeting*