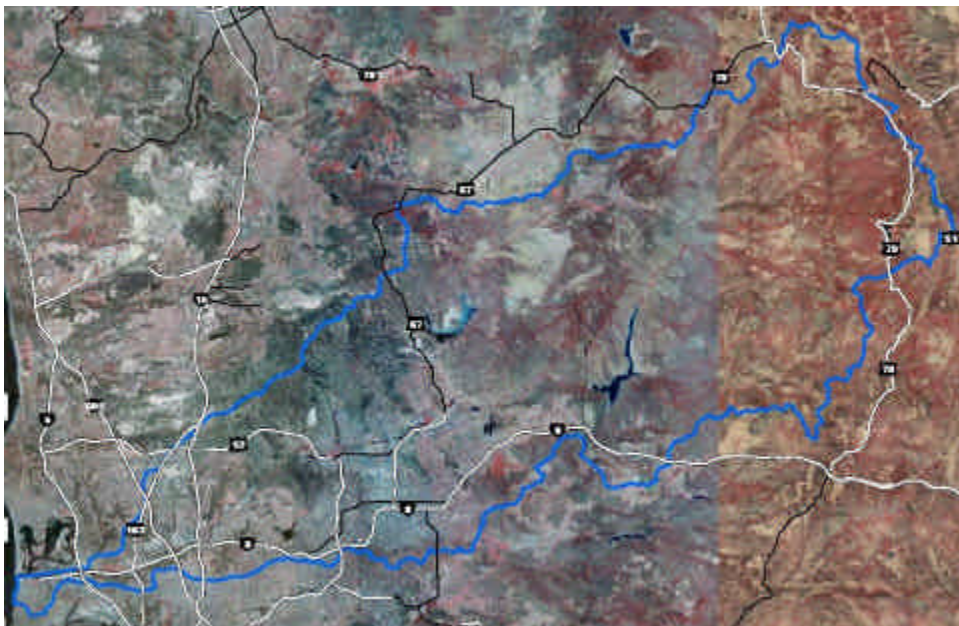




www.projectcleanwater.org/ws_san_diego_river.html



SAN DIEGO RIVER WATERSHED BOUNDARIES

PURPOSE OF WATERSHED PLANNING

WHY UNDERTAKE A WATERSHED MANAGEMENT PLAN?

- Address forecasted population growth
- Reduce & manage habitat/species impacts
- Improve water quality
- Navigate increasing regulations
- Accrue benefits of a cooperative strategy
- Protect & enhance our quality of life

KEY EXPECTATIONS

Land use & regional planning authorities need to be involved to implement watershed management ideas

A coordinated & consistent effort toward the removal of invasive exotic species is needed

Policies developed should allow water to sustain natural communities & prevent health risks to humans from pollutants

Buffer zones should be established along riparian corridors to preserve water quality

Encourage water conservation to increase availability

KEY EXPECTATIONS

Acquiring lands to create wetlands is surest way to preserve & protect water quality

Water quality should be improved by creating extensive wetland areas

Strategies should be implemented to reduce or eliminate development in the flood plain

Riparian habitats are dependent on flood stimulation

Outreach programs that engage schools & provide hand-on experienced are needed

PURPOSE OF WATERSHED PLANNING

BENEFITS OF COOPERATIVE PLANNING

- Coordination of information
- Informed decision-making
- Improved water quality
- Groundwater protection
- Habitat & wildlife protection

PURPOSE OF WATERSHED PLANNING

ADDITIONAL BENEFITS OF COOPERATIVE PLANNING

- Coordinated public plan development – cooperative open structure
- Establish cooperative planning & implementation network
- Coordinate ideas & innovations
- Coordinate related public & private sector actions
- Coordinate & maximize funding
- Establish permanent watershed data repository

PROJECT APPROACH

Public involvement in the development of the WMP has been important from its inception in 2002



Watershed Work Group (WWG) has been instrumental in guiding & shaping the WMP



Strategy for WMP development:

- Collect existing data
- Identify & prioritize stakeholder concerns
- Analyze existing data
- Address identified concerns



PROCESS OBJECTIVES

- Develop-
 - Vision
 - Principals & Goals
 - Strategies to achieve these goals
- Establish framework for developing the WMP
- Set stage for WMP implementation

VISION STATEMENT



“Enhance the quality of life in our communities by preserving and re-establishing the natural functions and features of the San Diego River Watershed. These natural watershed characteristics will be sustained by protecting and conserving the water, land, and habitats of the San Diego River Watershed, while preserving its cultural heritage.”

GUIDING PRINCIPLES

- Enrich the quality of life for future generations
- Make watershed decisions in a holistic manner
- Base decisions on sound science & best available information
- Support the development of new & better information & management practices
- Advocate watershed stewardship
- Engage an active citizenry



GUIDING PRINCIPLES

- Promote stakeholders' understanding of watershed
- Encourage citizens, communities & agencies to communicate, coordinate, cooperate & collaborate
- Protect & restore natural watershed functions
- Manage water supply & water use in a sustainable manner
- Improve water quality
- Safeguard cultural & historical resources
- Utilize the WMP as a living document



TOOLS UTILIZED IN WMP DEVELOPMENT

Land use plans & other planning documents developed by key stakeholder groups:

- Cities (City of San Diego River Park Master Plan)
- County
- State agencies (Parks & Rec, Caltrans)
- Federal resource agencies (USFS, BLM)
- Tribal reservations (Barona, Capitan Grande, Inaja & Cosmit)

Regulations & regulatory reports:

- The Clean Water Act
- The Porter-Cologne Act
- The California Environmental Quality Act
- Watershed Urban Runoff Management Plans
- Jurisdictional Urban Runoff Management Plans
- National Pollution Discharge Eliminations System reports

TOOLS UTILIZED IN WMP DEVELOPMENT

Watershed-specific Studies (developed as part of project):

- Stakeholder Input Report #1 (Needs & Expectations)
- The List of Existing Data & Information Collected
- The Watershed Characteristics Inventory Report
- The Water Quality Report
- The Data & Information Management Plan
- The Watershed Assessment Report
- Stakeholder Input Report #2 (Strategy through stakeholder input)

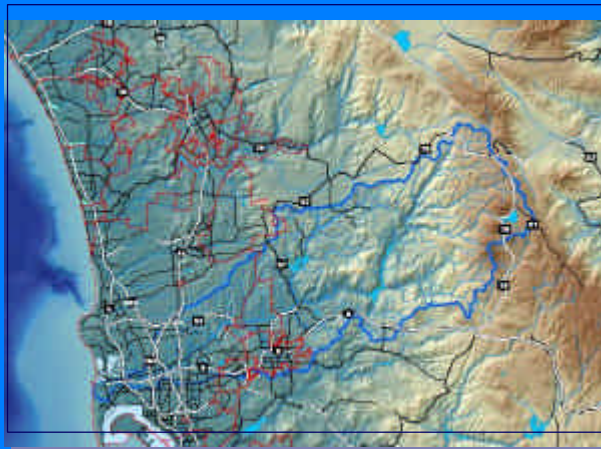
Available on Project Clean Water website

www.projectcleanwater.org/ws_san_diego_river.html

WATERSHED CHARACTERISTICS

Key Characteristics:

- 440 Square Miles (279,557 acres)
- Natural vegetation covers 58% of the Watershed
- Cleveland National Forest, Cuyamaca State Park & Mission Trails Regional Parks are key open space areas
- Is home to 509,000 & expected to grow to 617,000 by 2020
- Averages 9-30 inches of rainfall annually
- Supports 5 surface water storage reservoirs

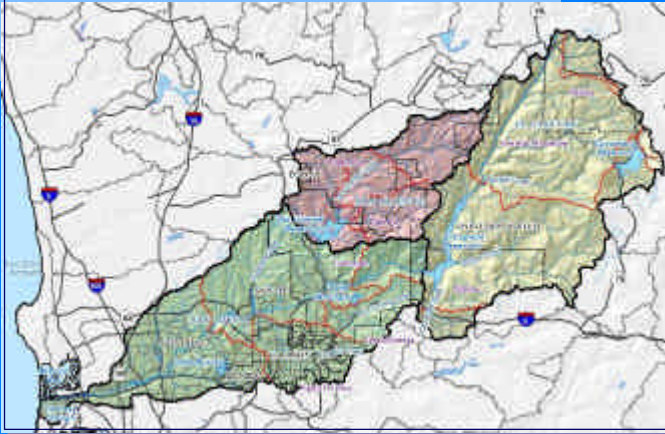


WATERSHED CHARACTERISTICS

HYDROLOGIC NETWORK & DIVIDES

Watershed can be divided into 3 major sub-basins:

- El Capitan
- San Vicente
- San Diego



WATERSHED CHARACTERISTICS

WATER QUALITY ISSUES

2002 Listed Segments:

Famosa Slough

Nutrients

Lower San Diego River

Low dissolved oxygen

Bacteria

Phosphorus

TDS

Mouth of San Diego River

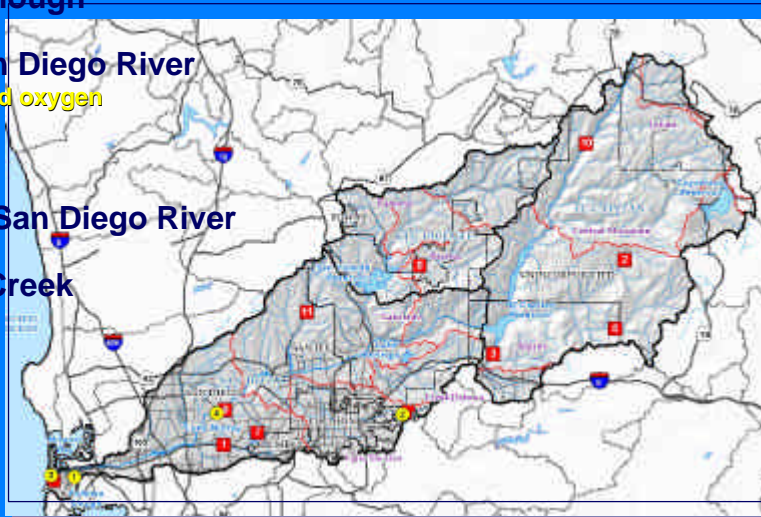
Bacteria

Forester Creek

Bacteria

pH

TDS



WATERSHED CHARACTERISTICS

WATER QUALITY ISSUES

2002 Monitoring List:

El Capitan Mgmt Area

Benzene, MTBE

Chlordane

Eutropic

Exotic species

Trash

San Vicente Mgmt Area

Eutropic

San Diego Mgmt Area

Chlordane, DDT, Dieldrin, PCBs

Eutropic

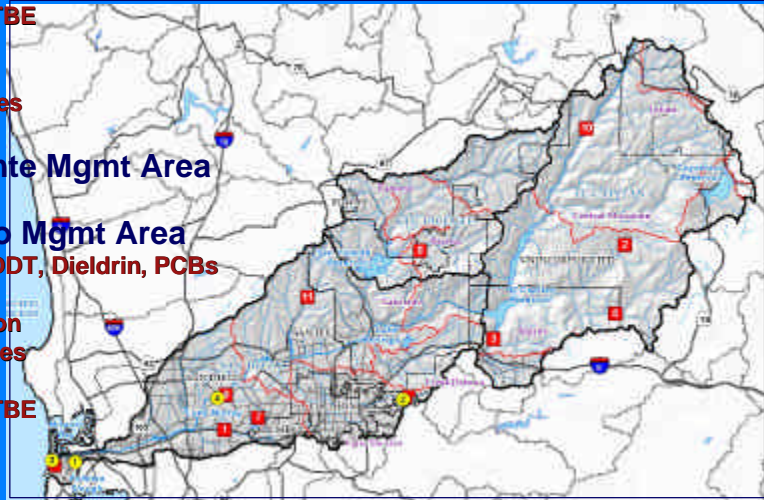
Sedimentation

Exotic Species

Phosphorus

Benzene, MTBE

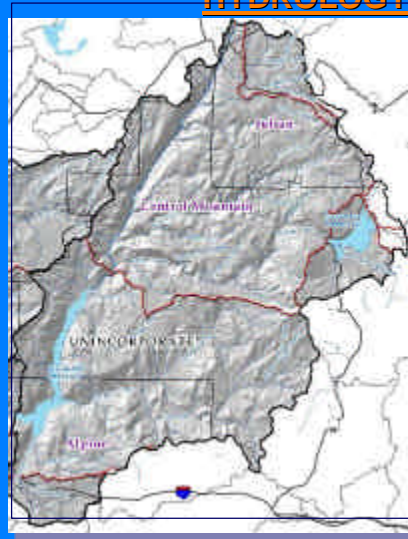
Trash



EL CAPITAN MANAGEMENT AREA

TOPOGRAPHIC LANDFORM

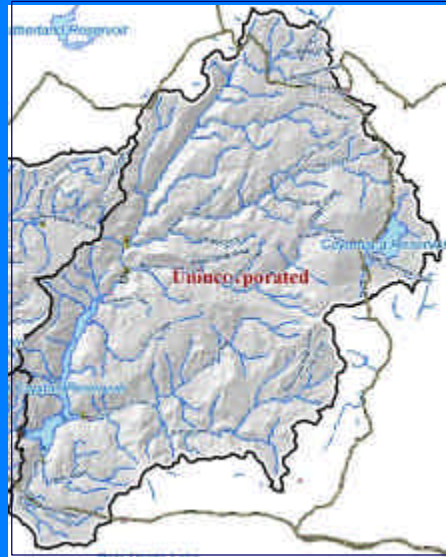
SURFACE & GROUNDWATER HYDROLOGY



EL CAPITAN MANAGEMENT AREA

MONITORING

- ◆ Alert Stations
- ▲ Non-USGS Monitoring Stations
- Source Water Sampling Sites
- ⊕ Stormwater Station
- ⊙ Reclamation Facility
- Reservoir Sampling Sites
- ★ NPDES Monitoring Locations
- ◆ PDMWD NPDES Discharge
- ⊙ Bio Assessment Monitoring Sites
- ⊙ USGS Monitoring Stations
- Coastal Outfall
- ⊙ Dry Weather Monitoring Stations



EL CAPITAN MANAGEMENT AREA

VEGETATION COMMUNITIES

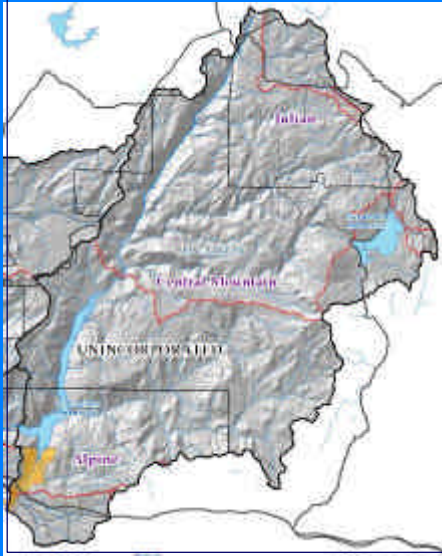


SENSITIVE SPECIES

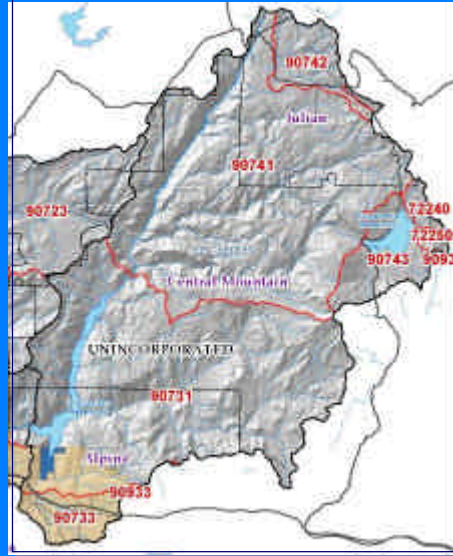


EL CAPITAN MANAGEMENT AREA

BCLA

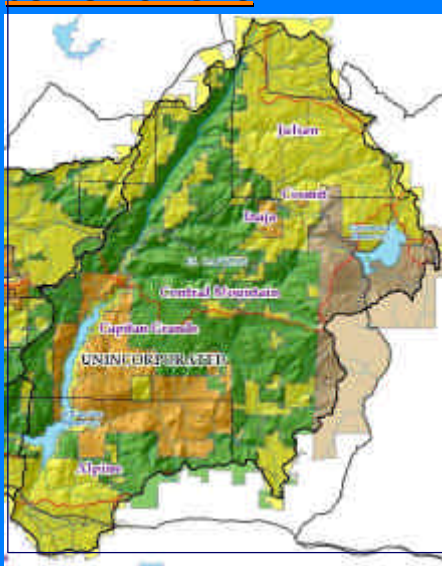


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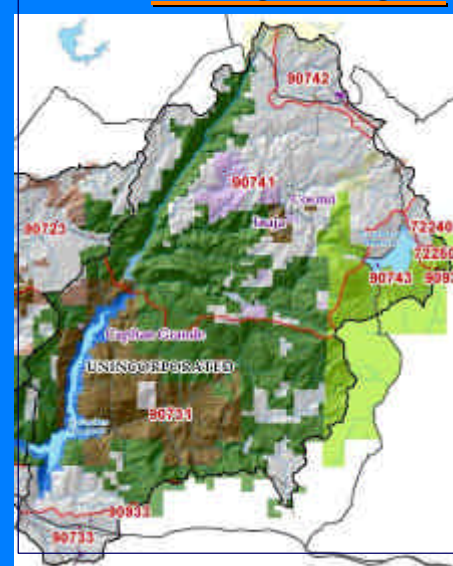


EL CAPITAN MANAGEMENT AREA

JURISDICTIONS

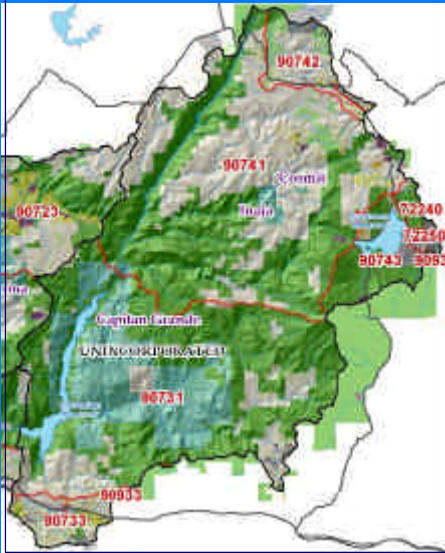


LAND OWNERSHIP

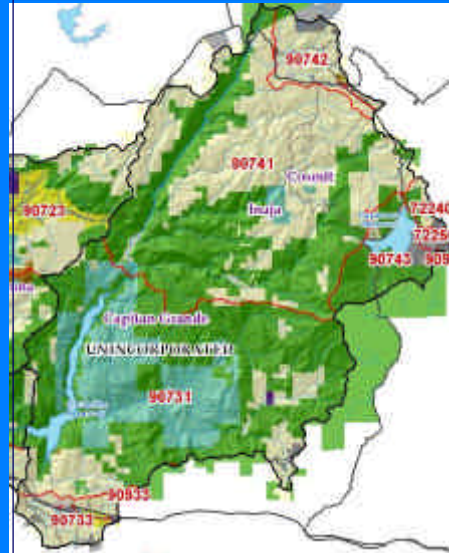


EL CAPITAN MANAGEMENT AREA

EXISTING LAND USE

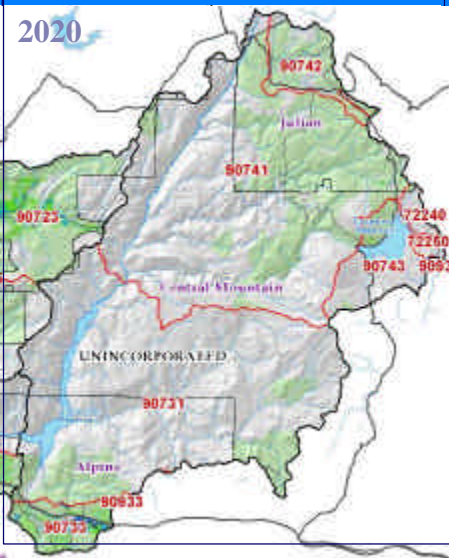


PLANNED LAND USE

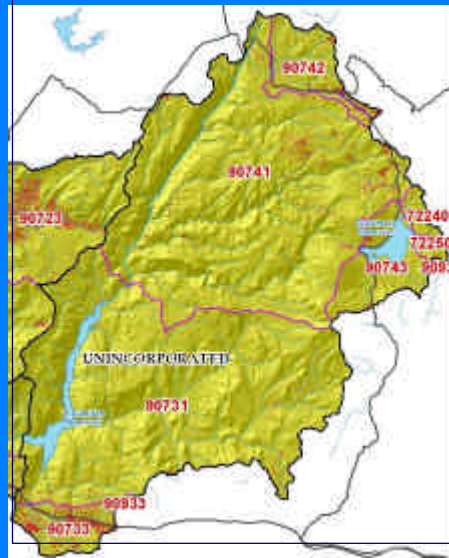


EL CAPITAN MANAGEMENT AREA

POPULATION DENSITY

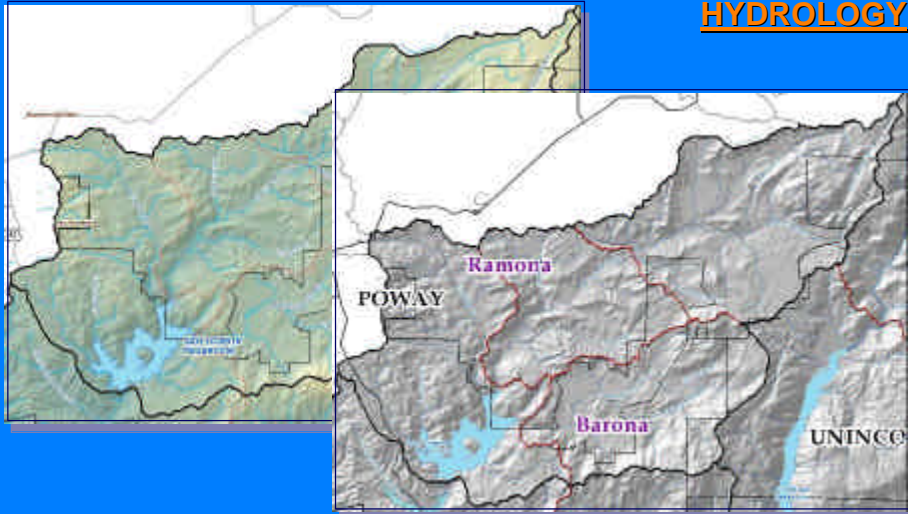


IMPERVIOUS SURFACES



SAN VICENTE MANAGEMENT AREA

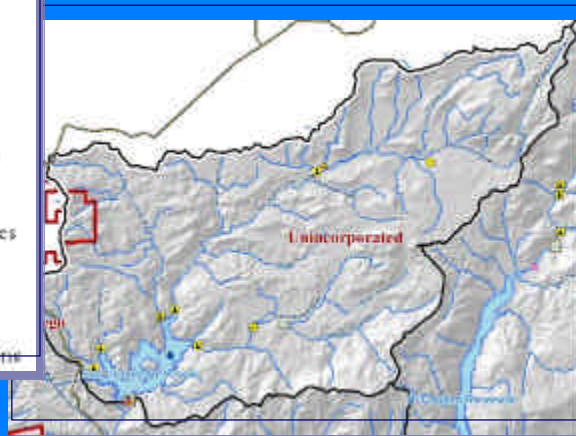
TOPOGRAPHIC LANDFORM SURFACE & GROUNDWATER HYDROLOGY



SAN VICENTE MANAGEMENT AREA

MONITORING

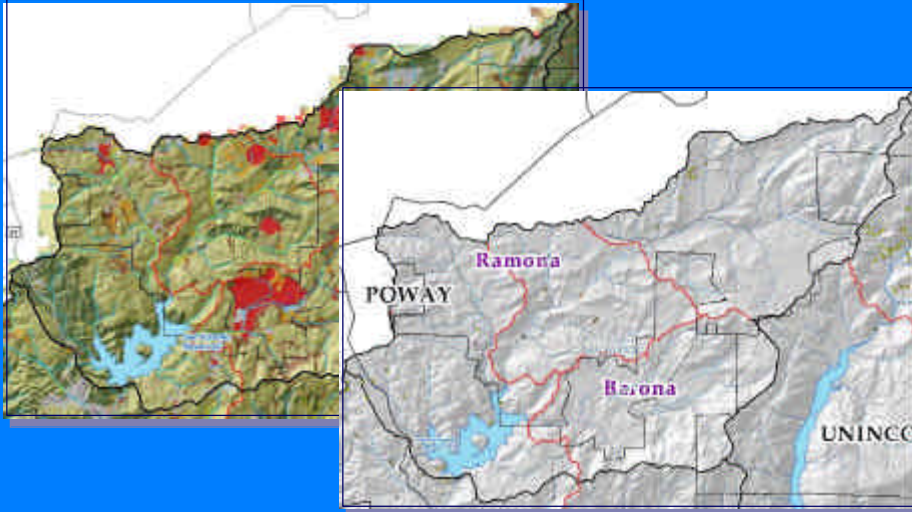
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- ⊕ Dry Weather Monitoring Stations



SAN VICENTE MANAGEMENT AREA

VEGETATION COMMUNITIES

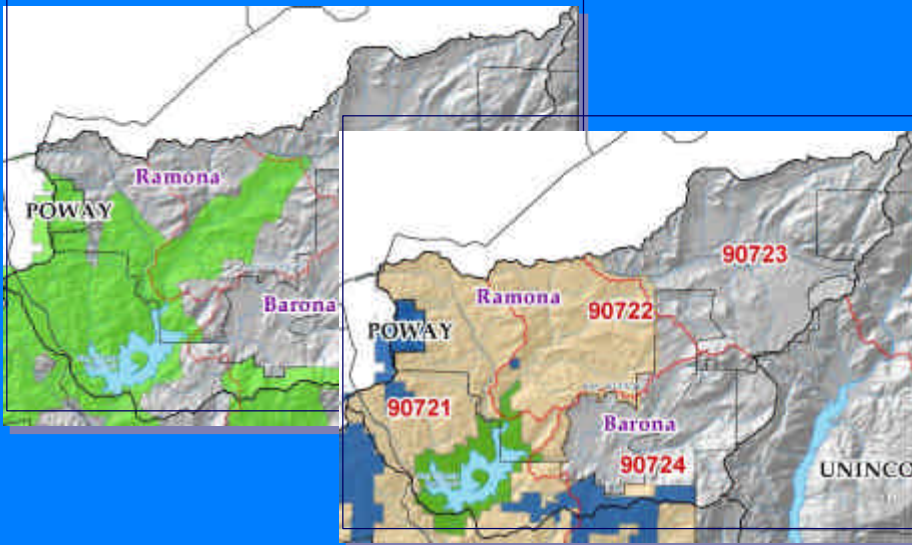
SENSITIVE SPECIES



SAN VICENTE MANAGEMENT AREA

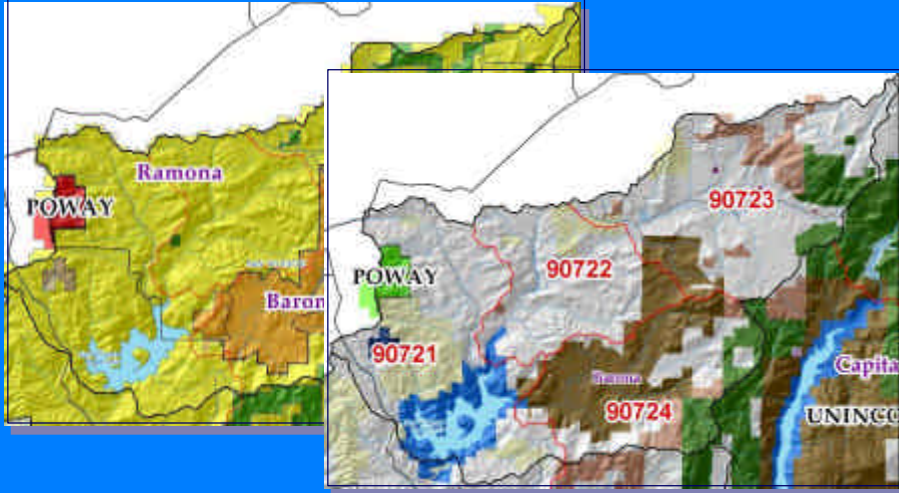
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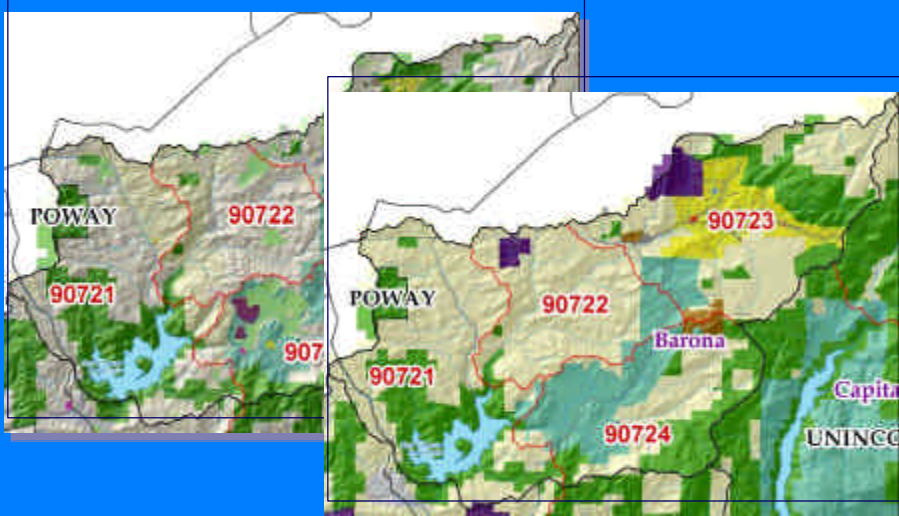
SAN VICENTE MANAGEMENT AREA

JURISDICTIONS



SAN VICENTE MANAGEMENT AREA

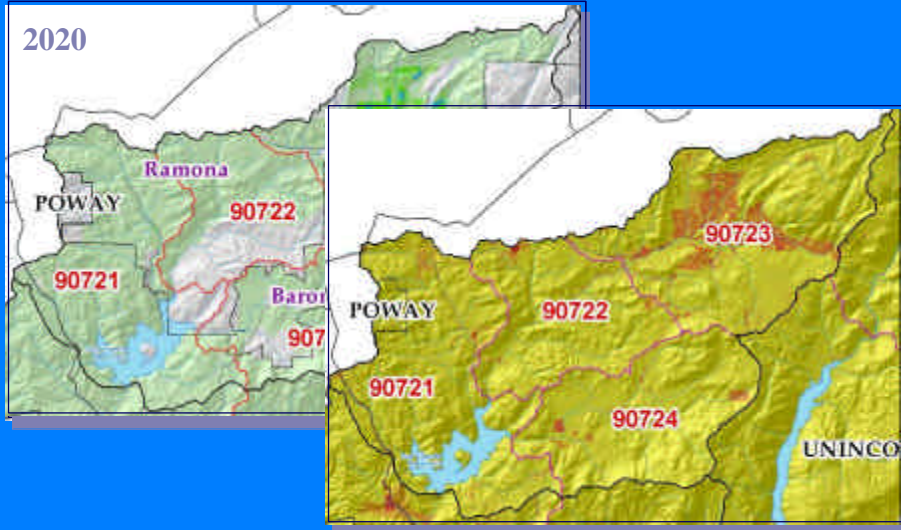
EXISTING LAND USE



SAN VICENTE MANAGEMENT AREA

POPULATION DENSITY

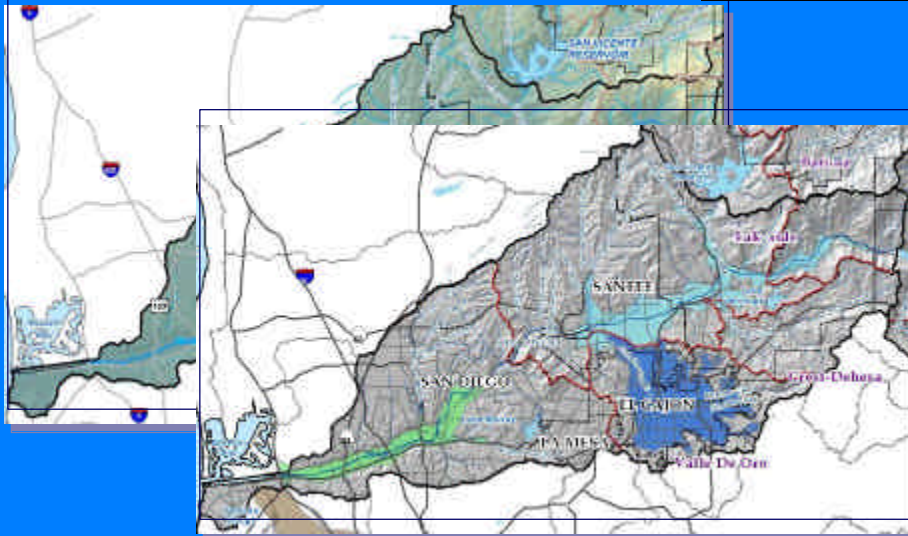
IMPERVIOUS SURFACES



SAN DIEGO MANAGEMENT AREA

TOPOGRAPHIC LANDFORM

SURFACE & GROUNDWATER HYDROLOGY



SAN DIEGO MANAGEMENT AREA

MONITORING

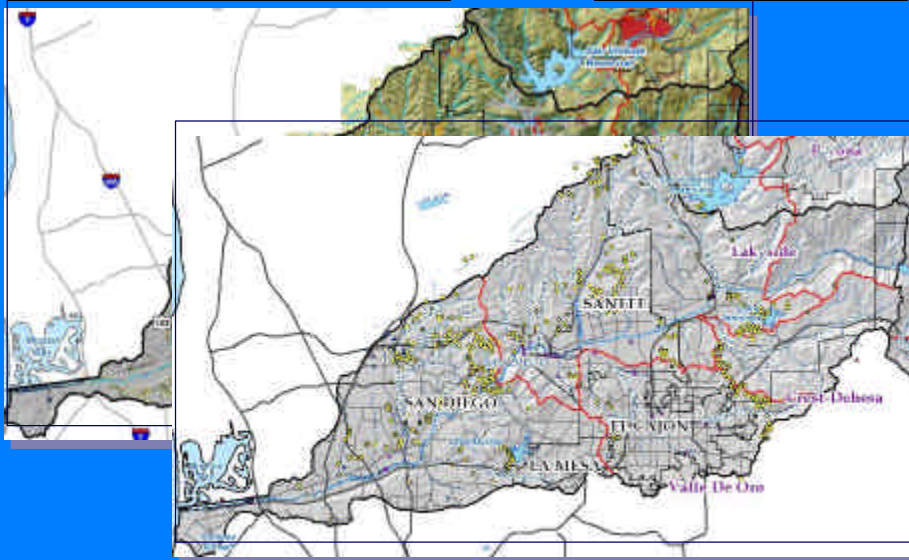
- ◆ Alert Stations
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SAN DIEGO MANAGEMENT AREA

VEGETATION COMMUNITIES

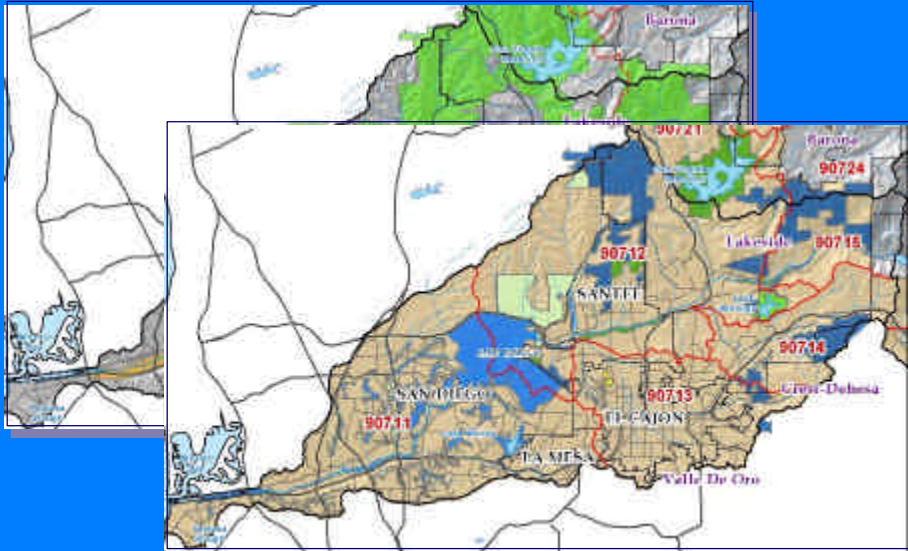
SENSITIVE SPECIES



SAN DIEGO MANAGEMENT AREA

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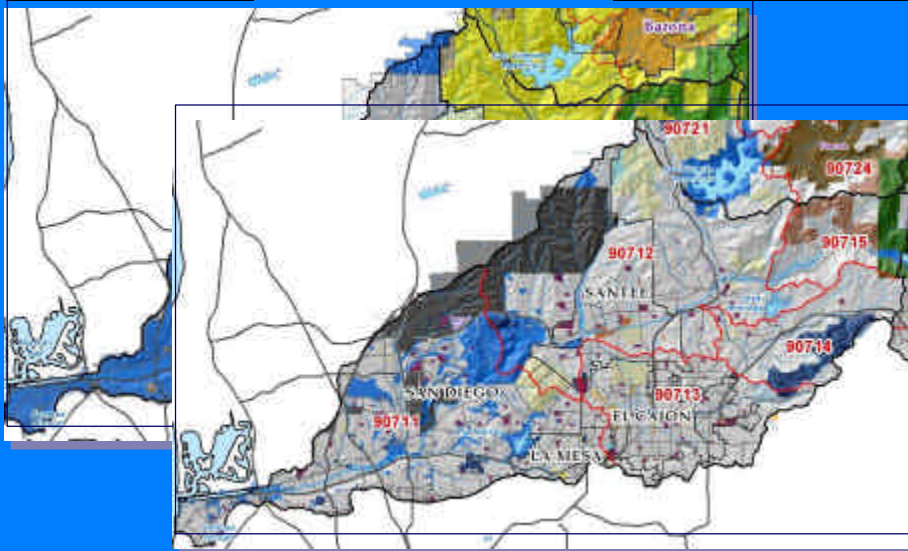
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SAN DIEGO MANAGEMENT AREA

JURISDICTIONS

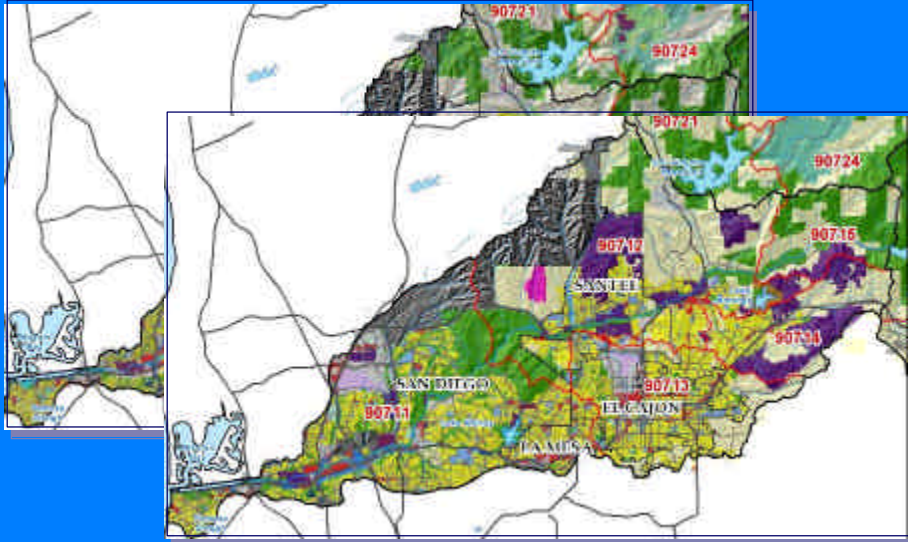
LAND OWNERSHIP



SAN DIEGO MANAGEMENT AREA

EXISTING LAND USE

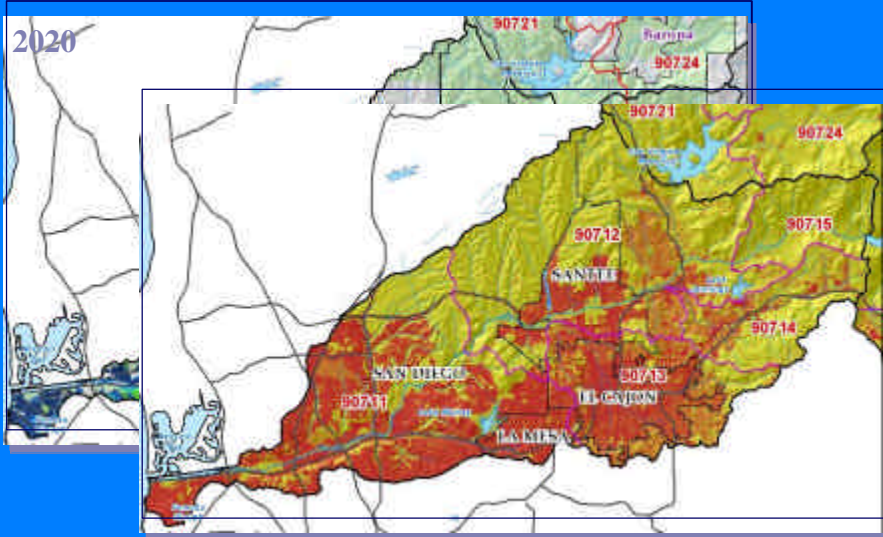
PLANNED LAND USE



SAN DIEGO MANAGEMENT AREA

POPULATION DENSITY

IMPERVIOUS SURFACES



WATERSHED ISSUES OF CONCERN

SURFACE WATER HYDROLOGY

- Lack of stream flow monitoring gauges along Forester Creek or San Vicente Creek
- Hydromodifications (Channelization, Culverts, Storm Drains)
 - Lack of guidelines or policies to effectively manage & control
 - Lack of data about the types, extents & locations of the modifications

SURFACE WATER QUALITY

- Constituents of Concern
 - El Capitan: Nutrients, TOC & TDS
 - San Vicente: Nitrates & Eutropic conditions
 - San Diego: Bacteria, Low DO, TDS, Turbidity, Copper, Pesticides & Nutrients

WATERSHED ISSUES OF CONCERN

GROUNDWATER

- Limited amount of recent characterization data
- Site specific contaminations from underground storage tanks
- Increases in TDS & Nitrate concentrations

BIOLOGICAL RESOURCES

- Habitat Destruction or Degradation is primary threat to conservation of biological diversity
- Exotic Species Control - introduced flora & fauna (amphibians, aquatic, terrestrial & avian) are detrimental to the health & function of the watershed

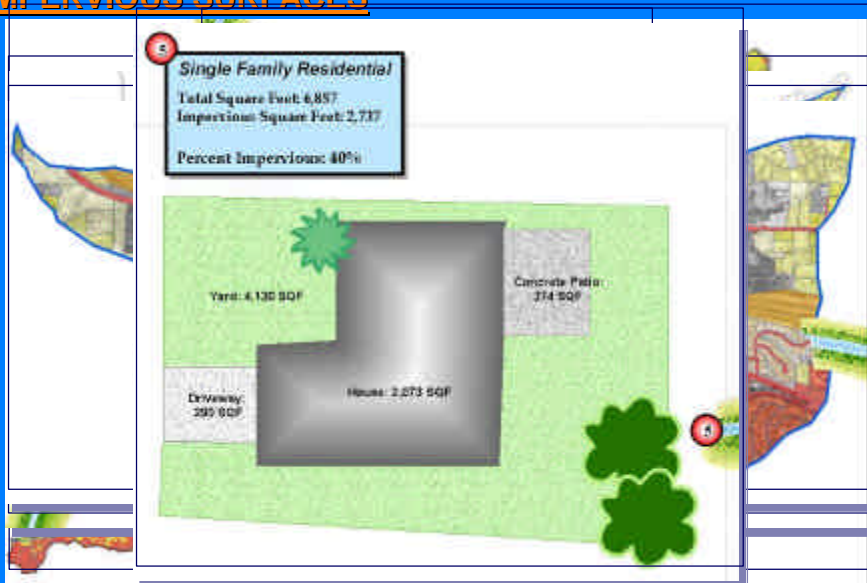
WATERSHED ISSUES OF CONCERN

LAND USE & PLANNING

- Interagency cooperation & coordination is needed for successful WMP implementation
- Mechanisms to map, manage & control impervious surfaces are needed
- A comprehensive & coordinated data management structure is needed to ensure:
 - Efficient & effective data collection
 - Identification of spatial & temporal trends
 - Decision makers are informed

WATERSHED ISSUES OF CONCERN

IMPERVIOUS SURFACES



ACTION RECOMMENDATIONS

APPROACH TO ACTION RECOMMENDATIONS

- Organized by over-arching issue area
- Structured to provide long-term flexibility & adaptability to evolving needs & issues
- Provides summaries of the problems & contributing factors – identifies early & long-term actions
- Identified actions are a starting point & should evolve as the WMP moves forward



ACTION RECOMMENDATIONS

Ongoing Collaborative Management & Interagency Cooperation

Summary:

- A collaborative management structure should be flexible & adaptable
- Structure should be inclusive & streamlined to enable efficient & effective decision-making
- Land managers need to coordinate & cooperate
- Non-profit & community groups need to be active & engaged
- GOAL: develop & implement a process that is structured yet flexible, inclusive yet manageable, & politically connected but not politically driven

Contributing Elements:

- The number of active management groups
 - San Diego River Conservancy
 - San Diego River Coalition
 - NPDES Copermittees
 - MSCP Participants
- The complex pattern of land ownership
 - County & Cities
 - Tribal Reservations
 - Military installation
 - Cleveland National Forest
 - Cuyamaca State Park

ACTION RECOMMENDATIONS

Ongoing Collaborative Management & Interagency Cooperation

Early Actions:

- Identify additional stakeholders to engage in process
- Develop an initial committee structure
- Identify stakeholders to coordinate, cooperate, communicate & collaborate on highest priority issues
- Form special working groups that report back to the larger group



Long-term Actions:

- Develop a management structure & membership that is stable & broad enough to enable policies to be developed & implemented consistently across jurisdictional & land management boundaries



ACTION RECOMMENDATIONS

Stakeholder Education & Outreach

Summary:

- Many issues are related to actions taken by individual stakeholders every day
- Most individuals do not understand what a watershed is, let alone how their actions effect its health & function
- Basic watershed based educational materials & outreach mechanisms are needed to improve understanding & develop stewardship
- Topic specific materials & programs are also needed and should be developed in conjunction with the other action recommendations

Contributing Elements:

- Watershed planning is a relatively new scientific study merging together diverse disciplines previously un-integrated
- Many watershed issues are invisible to the untrained eye
- Issues are often perceived as regulatory issues for governmental entities to manage

ACTION RECOMMENDATIONS

Stakeholder Education & Outreach

Early Actions:

- Identify target groups to focus initial outreach efforts
- Determine effective mechanisms for distribution & measuring success
- Develop or augment basic outreach materials focusing on the SDRW & its issues
- Identify existing programs to integrate into to facilitate information dissemination



Long-term Actions:

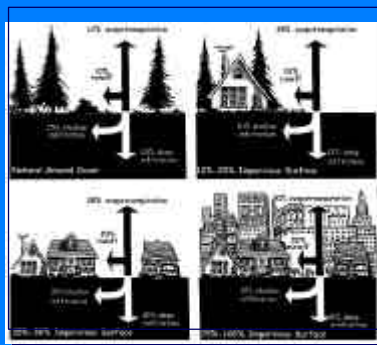
- Maintain & augment outreach efforts associated with Early Action recommendations
- Ensure education & outreach efforts are coordinated & complimentary within all Action Recommendations

ACTION RECOMMENDATIONS

Hydromodification

Summary:

- Human modifications to surface water hydrology can result in:
 - Higher flood elevations
 - Increased flood frequency
 - Loss of habitat
 - Decreased groundwater recharge
 - Elevated base-flows from irrigation return flow & urban runoff
- Issues need to be addressed comprehensively & in a coordinated manner



Contributing Elements:

- Modifications to the hydrologic system
- Land Development
 - Impervious Surfaces
 - Irrigation return flows & urban runoff

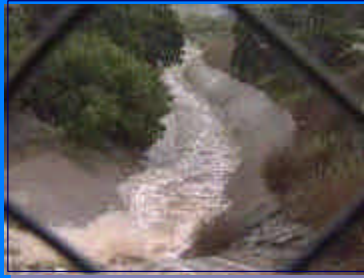


ACTION RECOMMENDATIONS

Hydromodification

Early Actions:

- Develop regional mapping procedures for identifying impervious surfaces
- Establish additional hydrologic monitoring stations
- Develop land use / impervious surface relationships & use to model future land use scenarios
- Identify & map existing hydromodifications
- Develop a watershed modeling framework & goals:
 - Develop modeling & assessment goals
 - Delineate sub-basins & catchments
 - Identify data gaps & develop program to fill



Long-term Actions:

- Integrate impervious surface criteria into the land development review process

ACTION RECOMMENDATIONS

Groundwater Management

Summary:

- Limited quality & quantity data existing for El Capitan & San Vicente management areas
- Significant historic data exists within the San Diego management area, but have not been updated since the 1990's
- Groundwater use has been limited in areas by TDS, nitrate, iron, manganese & MTBE
- Monitoring efforts are not coordinated or standardized

Contributing Elements:

- Public water supply monitoring is limited & infrequent
- Private well data is typically confidential
- Groundwater contamination data is usually spatially limited & narrowly focused
- Well owners collect & record data differently



ACTION RECOMMENDATIONS

Groundwater Management

Early Actions:

- Identify & inspect active wells & usage
- Select representative wells & gain permission for long-term monitoring to characterize availability & quality
- Compile monitoring data into central database
- Research fertilizer use & management strategies
- Provide outreach on proper fertilizer use & storm runoff protection
- Continue septic tank discharge regulations
- Continue requirements of Groundwater Ordinance
- Coordinate with Tribal Reservations on groundwater use

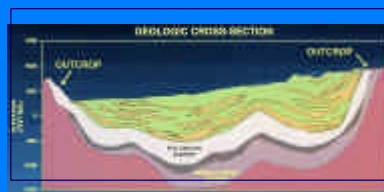


ACTION RECOMMENDATIONS

Groundwater Management

Long-term Actions:

- El Capitan & San Vicente- Review collected well, groundwater use & availability data to determine if:
 - Revision of the Groundwater Ordinance is required
- San Diego- Review collected data to:
 - Develop updated salt balance estimates for principal aquifers & project future quality trends
 - Determine if physical projects should be considered for enhancing groundwater supply & quality
- All- Review collected data to determine if:
 - Further regulation of wastewater dischargers is appropriate
 - Determine if revision of the Basin Plan is warranted



ACTION RECOMMENDATIONS

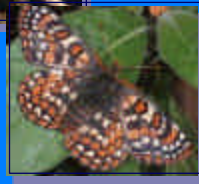
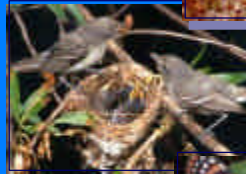
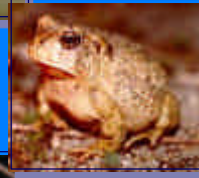
Habitat Degradation

Summary:

- Habitat loss is number one threat to conservation of biological diversity
- Multi-jurisdictional NCCP/HCP plans focusing on target species & habitats
- Opportunities for synergistic benefits with watershed management should be identified
- Lands that provide hydrologic functions & aquatic habitat should be targeted

Contributing Elements:

- Watershed improvements not focus of NCCP/HCP plans
- Coordination of conservation & restoration efforts is needed
- Coordination with land use plans is needed
- Conservation areas need to be assessed for multiple benefits

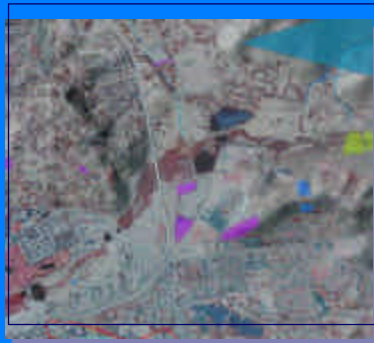


ACTION RECOMMENDATIONS

Habitat Degradation

Early Actions:

- Evaluate NCCP/HCPs for gaps important to watershed objectives
- Evaluate conserved & targeted lands for restoration potential
- Identify opportunities for joint multi-benefit projects
- Prioritize restoration opportunities where watershed functions can be enhanced



Long-term Actions:

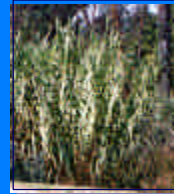
- Recommend land use policy changes to enhance protection & restoration of riparian & buffer zones
- Promote multi-benefit objectives within NCCP/HCPs
- Develop partnerships between land use agencies & environmental stewards for acquisition, restoration & management

ACTION RECOMMENDATIONS

Exotic Species Control

Summary:

- Invasive exotic species is one of the greatest threats to the conservation of biological diversity
- Exotic species can alter hydrology, erosion, sedimentation & water quality
- Are often early colonizers & out compete native species forming monotypic patches
- Exotic animals can create imbalanced predation, competition for resources & introduction of vectors
- Coordinated efforts & institutional support have not been developed enough to implement meaningful actions



Contributing Elements:

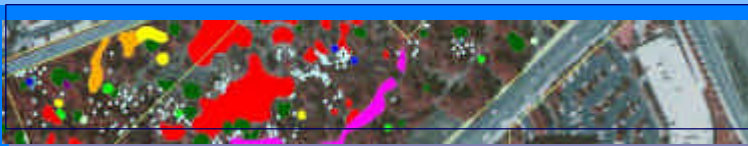
- A programmatic approach is needed with adequate fiscal & regulatory support & prioritization
- Outreach & regulatory support is needed to curb new infestations
- An ongoing surveillance & response program is needed

ACTION RECOMMENDATIONS

Exotic Species Control

Early Actions:

- Inventory exotic species & prioritize response actions
- Develop a systematic response plan integrating surveillance, control & eradication, introduction controls, public & private outreach, funding programs, effective management areas & milestones to measure success
- Initiate pilot eradication efforts
- Expand public & governmental interest, support & participation
- Identify & modify codes / ordinances banning invasive species in landscaping
- Remove, replace & maintain 'exotic plant free areas'
- Implement removal & maintenance programs to reduce exotic animal impacts to endangered species
- Develop & maintain a database of ongoing exotics species (plant/animal) eradication & control projects or programs



ACTION RECOMMENDATIONS

Exotic Species Control

Long-term Actions:

- Initiate land management programs promoting restoration of natural ecological & hydrological processes – healthy ecosystems are more resistant to exotic species
- Develop land use policies permitting compatible human activities minimizing risks of exotic species introductions
- Develop general education programs about detrimental effects of exotic invasive species to natural habitats & benefits of preserving open spaces with natural functioning ecosystems
- Restore & manage habitats with an ecosystem approach for endangered species – other sensitive species will benefit



ACTION RECOMMENDATIONS

Data Management

Summary:

- Managing the active collection, storage, categorization & analysis of spatial, attribute & hard copy data benefits large-scale planning efforts
- Developing & maintaining a comprehensive inventory of data & reports helps identify available information & data gaps
- Tools to allow stakeholders to access & manipulate the information would be valuable



Contributing Elements:

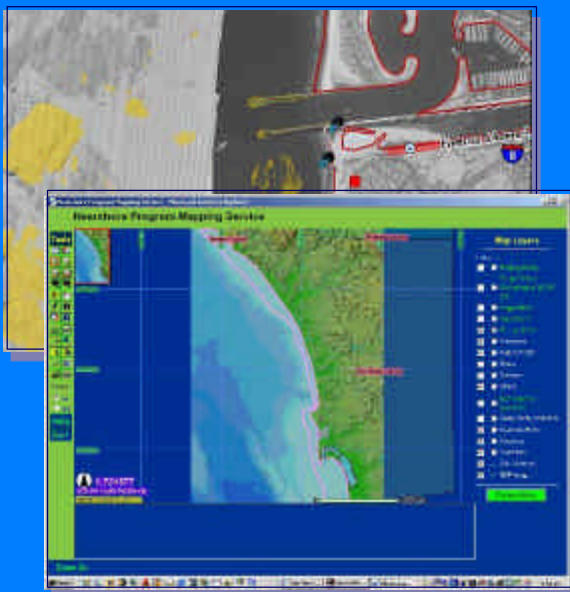
- The large number of entities collecting & maintaining data
- The potential for similar data needs by the various entities collecting data
- The potential for redundant data collection efforts
- The potential for data collected by different groups to be unusable to other groups without minor modifications

ACTION RECOMMENDATIONS

Data Management

Early Actions:

- Support & augment SDRPF efforts in developing & populating an inventory of monitoring efforts
- Determine availability of data to support development of high priority actions & fill data gaps
- Coordinate with stakeholders to determine feasibility & recommended structure for a watershed data repository



IMPLEMENTATION

OVERVIEW OF IMPLEMENTATION STRATEGY

Key Aspects of Current WMP:

- Local implementation
- No new institutional structures
- Voluntary public agency participation
- Actions are designed for phased local implementation
- The WMP is structured to provide flexibility
- Flexible forum can address changed or unforeseen needs
- Private sector participation encouraged
- Respect private property rights

OVERVIEW OF IMPLEMENTATION STRATEGY

Incremental Steps:

- Smaller, short-term actions will be required to reach the long-term goal in most cases
- Urgent issues may need to be addressed in the short-term but they may be difficult or expensive to achieve
- Other short-term efforts are ready to go and relatively simple to implement
- Preventative actions need to be initiated coincident or preferably prior to restoration actions

Measuring Success:

- Can be measured by many metrics
 - Acres of Exotics Removed
 - To Do List *vs* Actions Completed
- Method chosen is less important than ensuring progress is reported back to stakeholders, general public & media to maintain support



www.projectcleanwater.org/ws_san_diego_river.html