## Watershed Monitoring Tools Informing Los Angeles River Restoration Opportunities

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## History of the Los Angeles River





(USACE, 2013)

#### History of Los Angeles River



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(USACE, 2013)

## Los Angeles River Watershed Monitoring Program

- Watershed wide monitoring program established in 2008
- Stakeholders: LA Sanitation, County Public Works, City of LA, Burbank, Los Angeles Regional Water Quality Control Board (LARWQCB)
- Compliments and coordinates with statewide and regional programs



## LARWMP



- Guiding Questions
  - 1. What is the condition of streams in the watershed>
  - 2. Are conditions at areas of unique interest getting better or worse?
  - 3. Are receiving waters near discharge meeting water quality objectives?
  - 4. Is it safe to swim?
  - 5. Are locally caught fish safe to eat?



#### Upper and Lower Watershed





Urban

## Benthic Macro-invertebrate Assemblages



Image:dep.wv.gov

Natural



Collector Gatherer

Predator

Herbivore

Scraper



## Channelization and Urbanization

Land Use in the Los Angeles River Watershed



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Image: California State Water Resources Control Board

## Channelization and Urbanization

- Urbanization and channelization have altered flow regimes (IOES, 2017).
- Hydrology drives biology (TNC, 2016).
- Strong associations between BMI communities and physical habitat (channel alteration, %cobble and gravel, %concrete and asphalt) (LARWMP, 2015).
- BMI sensitive taxa only found in upper watershed (LARWMP, unpublished data).



(Mika et al., 2017)



- 2009 Station Fire
- Largest fire in LA
  County
- Improved Riparian habitat condition postfire
  - o Chemistry?
  - o Biological indicators?



## **Invasive Species**



Arundo donax

- Impact stream geomorphology and hydrology
- o Impact soil nutrient availability
- Large fuel load and fire impacts
- o Habitat conversion post-fire



### Habitat and Biological Condition





## LARWMP and Restoration

- Statistical methods can help identify the dominant stressors in the watershed
  - o Multivariate analysis
  - o Regressions and correlations
  - o Risk assessments can help rank stressors (Mazor, 2015)
    - Nutrients
    - Altered physical habitat
    - Major ions
- Problems: Replication and covariance
- Iterative process

#### LARWMP and Restoration



• Variable importance plot (LARWMP, 2015)

## LARWMP and Restoration

- Building our understanding of baseline conditions
- Identify sites in poor biological condition
- Can help identify dominant stressors in the watershed to support management and restoration activities
- Can help track efficacy of restoration efforts.



## **Restoration Framework**

- 1. Identify processes leading to degradation or decline
- 2. Develop methods to reverse or ameliorate the degradation or decline
- 3. Determine realistic goals for reestablishing species and functional ecosystems, recognizing the ecological limitations on restoration and the socioeconomic and cultural barriers to its implementation
- 4. Develop easily observable measures of success
- 5. Develop practical techniques for implementing these restoration goals at a scale commensurate with the problem
- 6. Document and communicate these techniques for broader inclusion in land use planning and management strategies
- Restoration Framework: Hobs and Norton, 1996

## Restoration in the Lower Los Angeles River Watershed

SB 530

- Establishes Lower Los Angeles River working group, CWH member
- "The working group shall develop, through watershed-based planning methods, a revitalization plan that addresses the unique and diverse needs of the Lower Los Angeles River and the communities through which it passes. "

#### **Restoration Challenges**



(LA County Park Needs Assessment)

- Does revitalization = restoration?
- What do we restore to?
- Can we restore without compromising flood protection?
- Will restoration on small parcels of land in urban spaces improve in stream ecology?
- Balancing restoration
  priorities and community
  needs.



#### Multi-Benefit Approach to Restoration





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#### Questions

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