Decision framework for SCAPE validation: SOP

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# Background

* CSCI is the foundation of stream bioassessment in CA
* The landscape model (LSM) provides a context for CSCI scores
* We need to validate the information for high priority sites
* Who this document is for
* What this document provides
* What this document is not

# Validation

## Workflow description

* What is validation?
  + General process of confirming validity of CSCI score and LSM category for guiding management decisions
  + Validation is within a larger framework that begins with comparing CSCI scores to LSM classification and ends with a decision on how to proceed (e.g., rapid screening for causal assessment, accept as is, collect more data)
* Validation process
  + Evaluate both CSCI and LSM assessments
  + The assessment can be invalidated at any step, which may prompt collection of appropriate data
  + Desktop validation - uses readily available data from CSCI output or SCAPE website
  + External validation - requires evaluation of external datasets, including supporting GIS data, field information, etc.
* Types of recommended and required data
  + CSCI QAQC info
  + LSM QAQC info, SCAPE eval
  + Supporting data (external GIS, field data, etc.)
* Decisions determine if you continue validation or reach a validation outcome
* Validations outcomes: What decisions do you make once CSCI/LSM are/aren’t validated?
  + The CSCI score is as expected or the site is otherwise low priority - continue baseline maintenance and monitoring
  + Validated
    - Conduct RSCA
    - Other alternative action
  + Not validated for CSCI or LSM
    - trust results anyway
    - get more samples
    - visit site

## Data sources

List of resources to assist with building the validation tool set - can go here or in appendix.

* CSCI metadata (consult CSCI SOP and package documentation)
* SCAPE website
* Reference site information (most similar references sites to the test site, will have an R function for this)
* GIS data
  + StreamCat
  + NHD hydrography
  + Catchment/Watershed layers
  + LU/LC data - NLCD 2006, 2011, NAIP aerial imagery
  + GIS metrics for CSCI
  + Google imagery + time slider
* Field data
  + SWAMP, SMC, CEDEN
* Local knowledge
  + Field notes
  + Site photos
* Additional external datasets
  + weather conditions (noaa.gov/weather)
  + Fire perimeters
  + Dredging (?)
  + Mining (?)
  + Timer harvest/silviculture (?)

## CSCI

1. Is the sample count sufficient?
2. Are there many ambiguous individuals or taxa?
3. Was the sample outside of the typical index period?
4. Was the sample affected by temporary disturbances?
5. Unusual sampling conditions (flow was too low/high for sample nets)?
6. Unusual settings where CSCI is known to give low scores?
7. Uncertainty in score with n = 1? Or high variability with repeat visits? Or score is very close to decision points (e.g., 0.77 or 0.80)?
8. Bad watershed delineation?

## SCAPE

1. Close to landscape model breakpoints?
2. Segment class is atypical of surrounding segments or landscape conditions (e.g., unconstrained surrounded by constrained)?
3. Channel has migrated from nominal location (NHD issues)?
4. Land cover has changed?
5. Constraints not captured by model (e.g., fire impacts, dredging, mining)?

# High priority sites in SGR watershed

* 405CE0280, SMC00480, SMC00144, SMC02972, SMC04524, SMC06496
* Why are these high priority?
* Validate CSCI/LSM results for each using available data to demonstrate the process
* What conclusions are made?