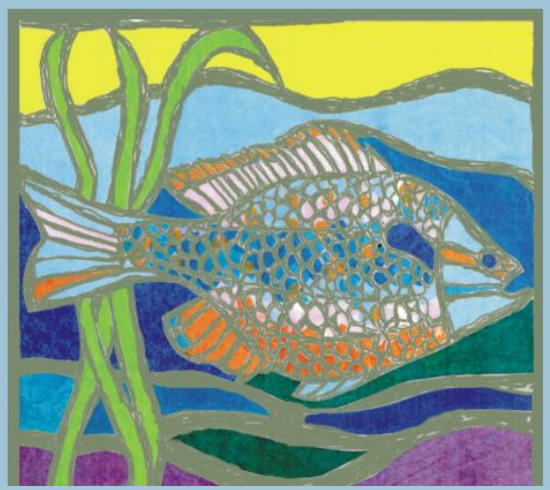


Tiered Aquatic Life Uses (TALU) in Southern California: Challenges and Implementation Strategies

November 30, 2004
CABW, UC Davis

Jerry Diamond Tetra Tech, Inc.

Purpose of TALU

A tool for:

- **Deriving scientifically defensible, bioassessment-based benchmarks for biological condition**
- **Integrating the benchmarks and biocriteria into WQS**
- **Setting designated aquatic life uses that factor in levels and types of human disturbances (tiering)**
- **Achievable goals for incremental restoration**
- **Better protection for excellent quality waters, more appropriate objectives for others**
- **Common bioassessment-based framework for communication & evaluation - public, stakeholders, across political boundaries**

Why Focus on TALU for Coastal Arid Streams

- Highly urbanized streams feeding into sensitive coastal estuaries and lagoons
- Southern CA streams flashy – flow variable
- Urban arid coastal streams not examined in arid west research project
- Need appropriate protection and uses for urban reaches while still protecting downstream coastal habitats

New CA-EPA Project

- **Examine Los Angeles as a case study**
- **Evaluate applicability of the TALU conceptual model**
- **Recommend appropriate tiered aquatic life uses**
- **Evaluate potential reference conditions for each tier**
- **Develop appropriate biocriteria for each tier.**

Benefits of Project

- **Los Angeles Region case example would be a prototype for TALU determinations in arid and semi-arid states**
- **Provide an opportunity to identify unique characteristics of arid coastal streams in TALU determinations**
- **Help facilitate acceptance of the TALU approach and ultimately its implementation in these types of waterbodies**
- **Builds upon existing work conducted by the SWRCB to develop a statewide framework for conducting UAAs related to aquatic life uses.**
- **Builds upon existing bioassessment work conducted by CFG**

What's Wrong with Having an Aquatic Life Use Category Like "WARM"?

- **Too broadly defined -** How can we compare two streams designated WARM with the current definition?
- **Difficult to determine if unachievable or impaired -** setting numeric goals to evaluate success in TMDL implementation
- **Tends to favor more and unfocused (contentious) UAAs**
- **Difficult to set reasonable remediation goals**
- **How to determine the highest attainable use for degraded waters?**

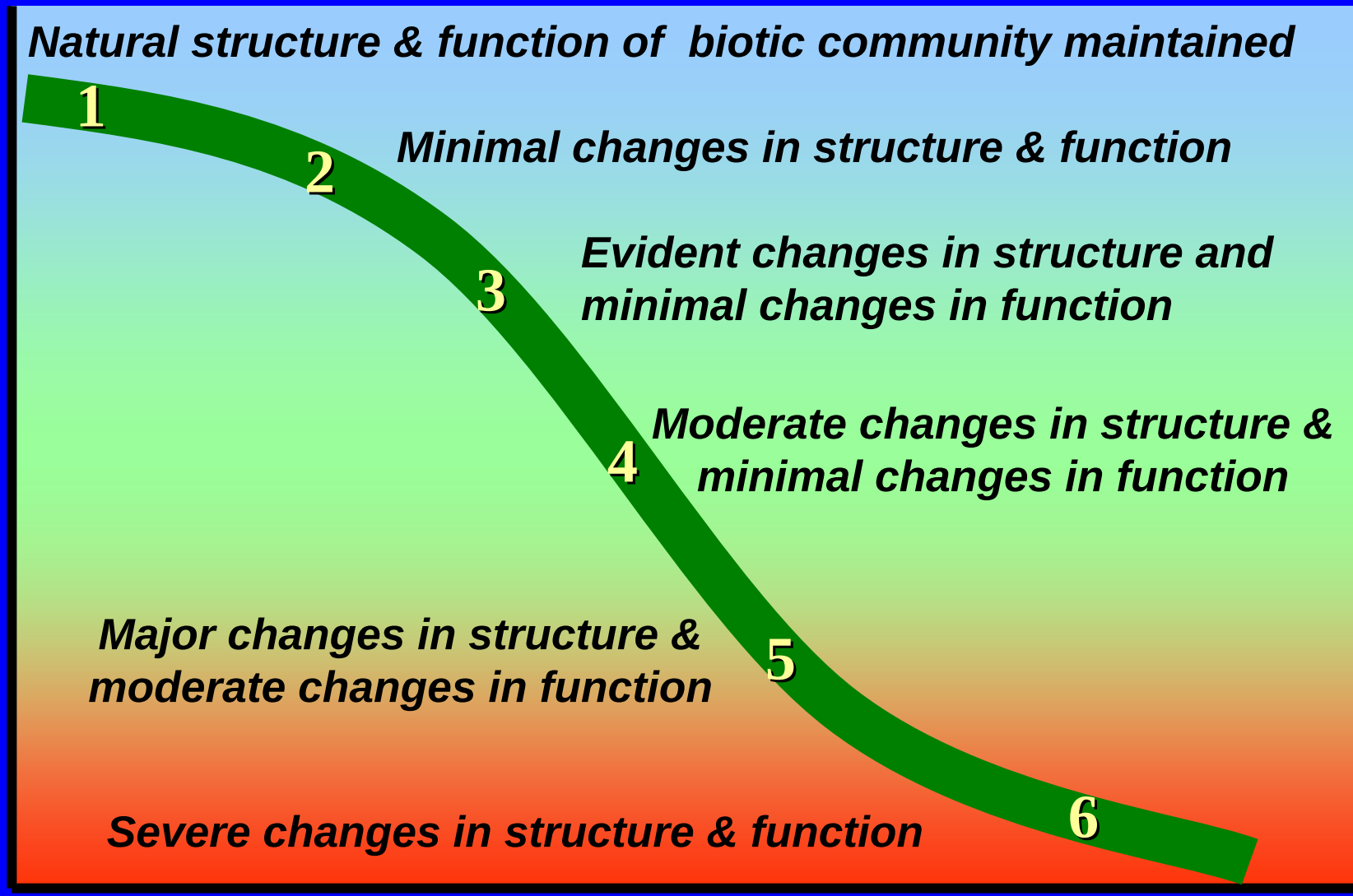
(TALU) integrates:

1. ***Biological Condition Gradient (BCG)***
2. ***Human Disturbance Gradient (HDG)***

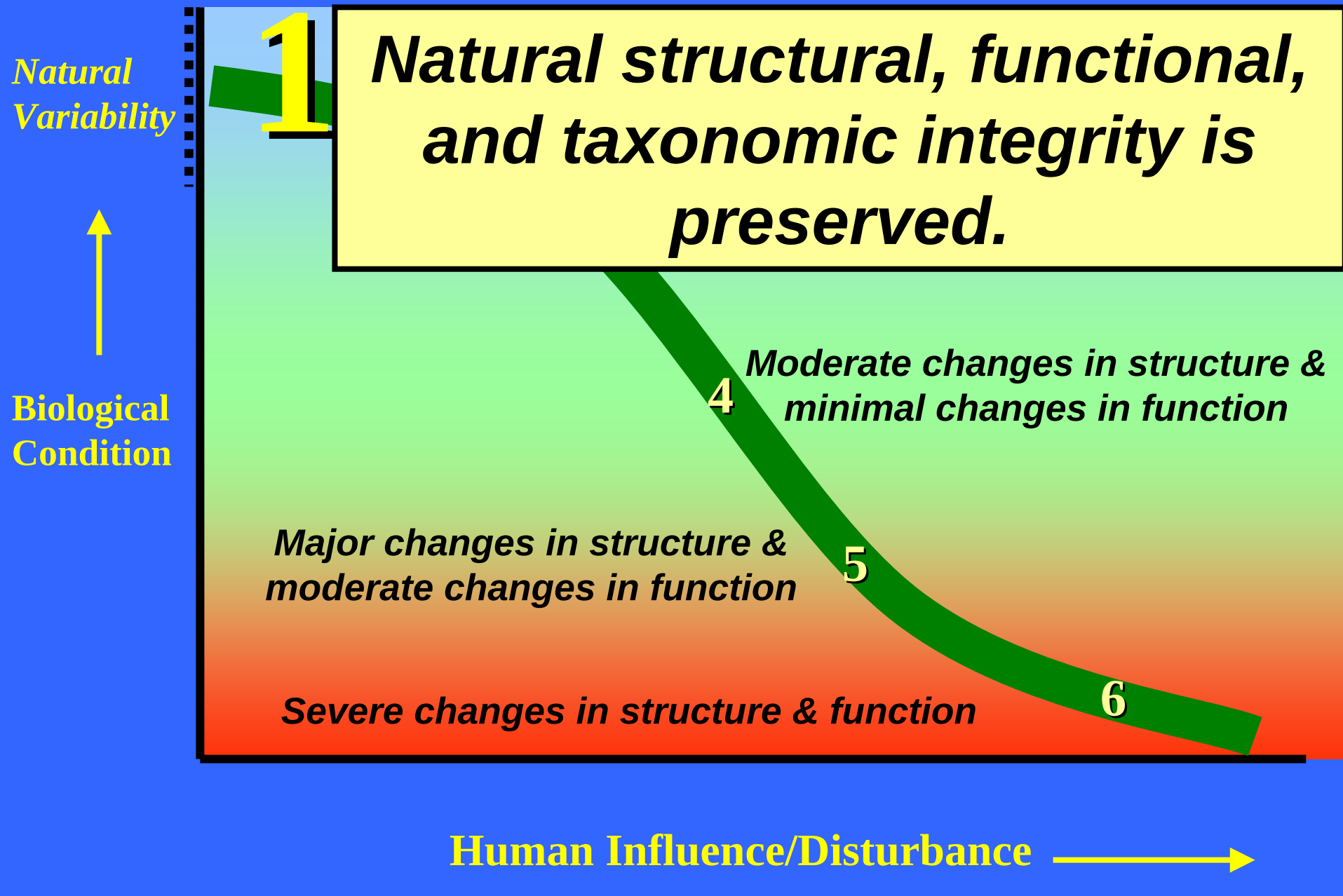
Biological Condition Gradient (BCG)

- A conceptual model or framework – details are **specific to a given region or ecotype**
- Specifies what is least impaired and minimally impaired biological conditions **for a given region or ecotype**
- Specifies a set of measurable biological attributes that define condition of an assemblage as stressors increase in frequency, magnitude, duration

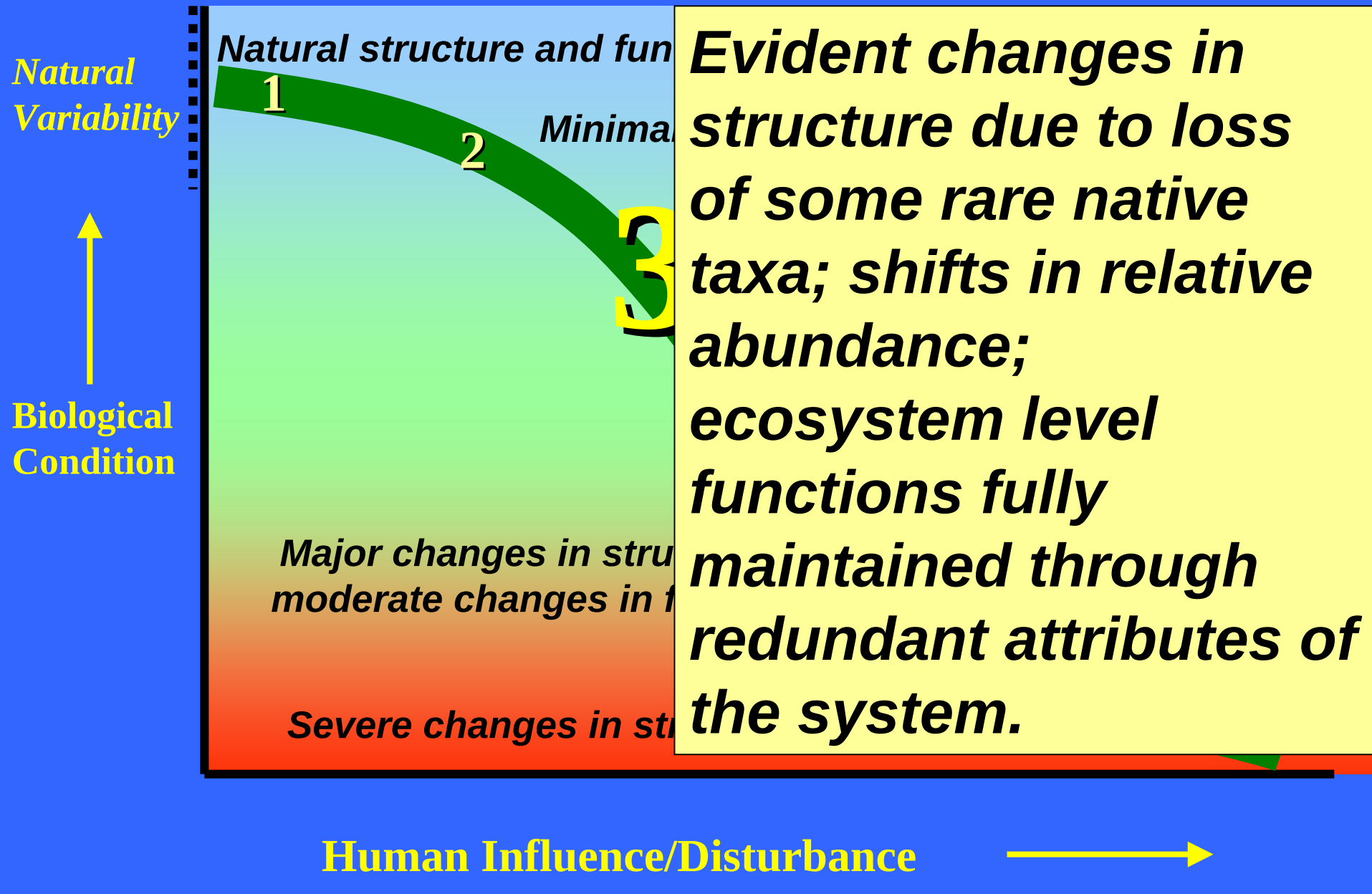
The Biological Condition Gradient – Concept



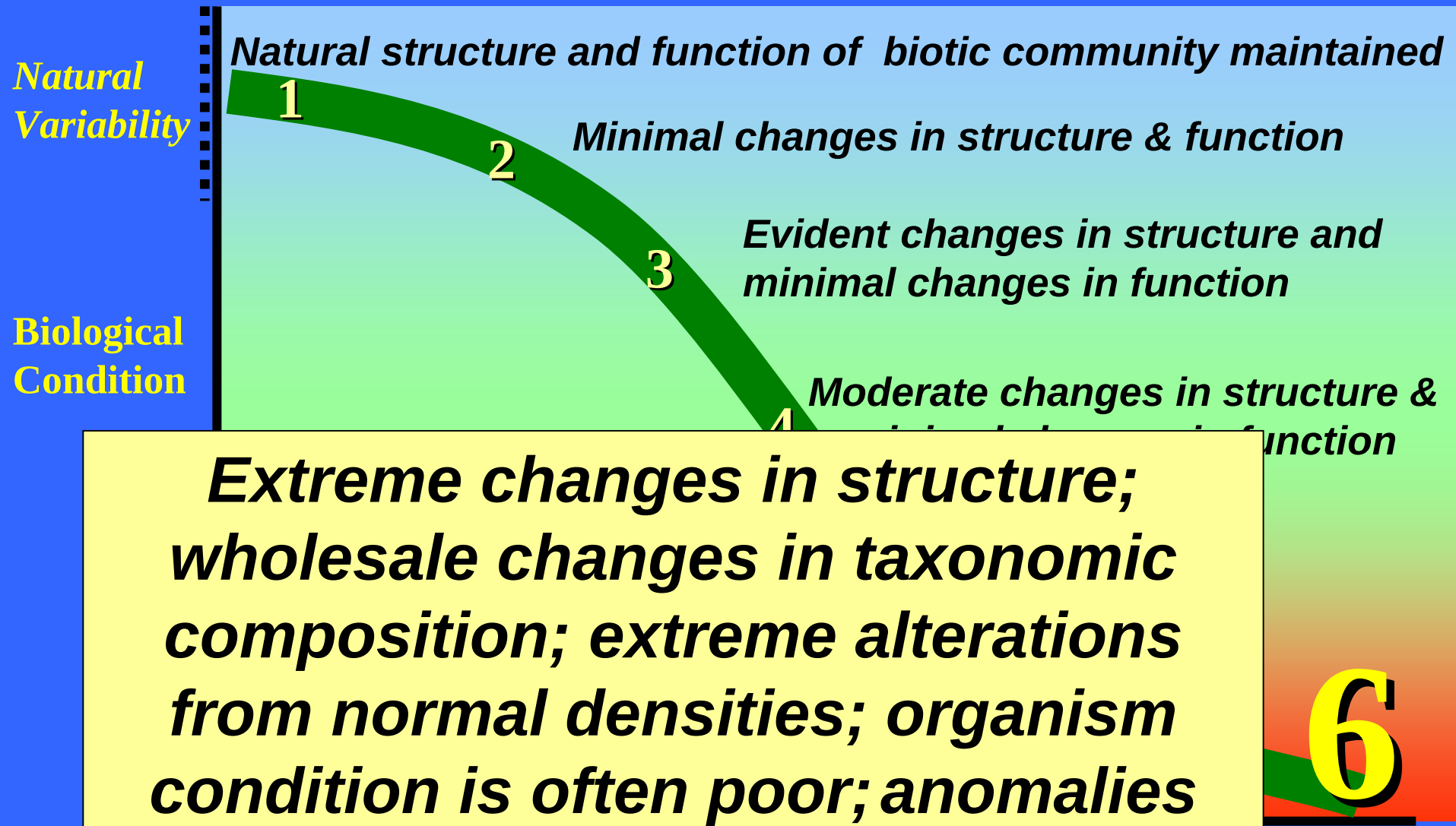
The Biological Condition Gradient



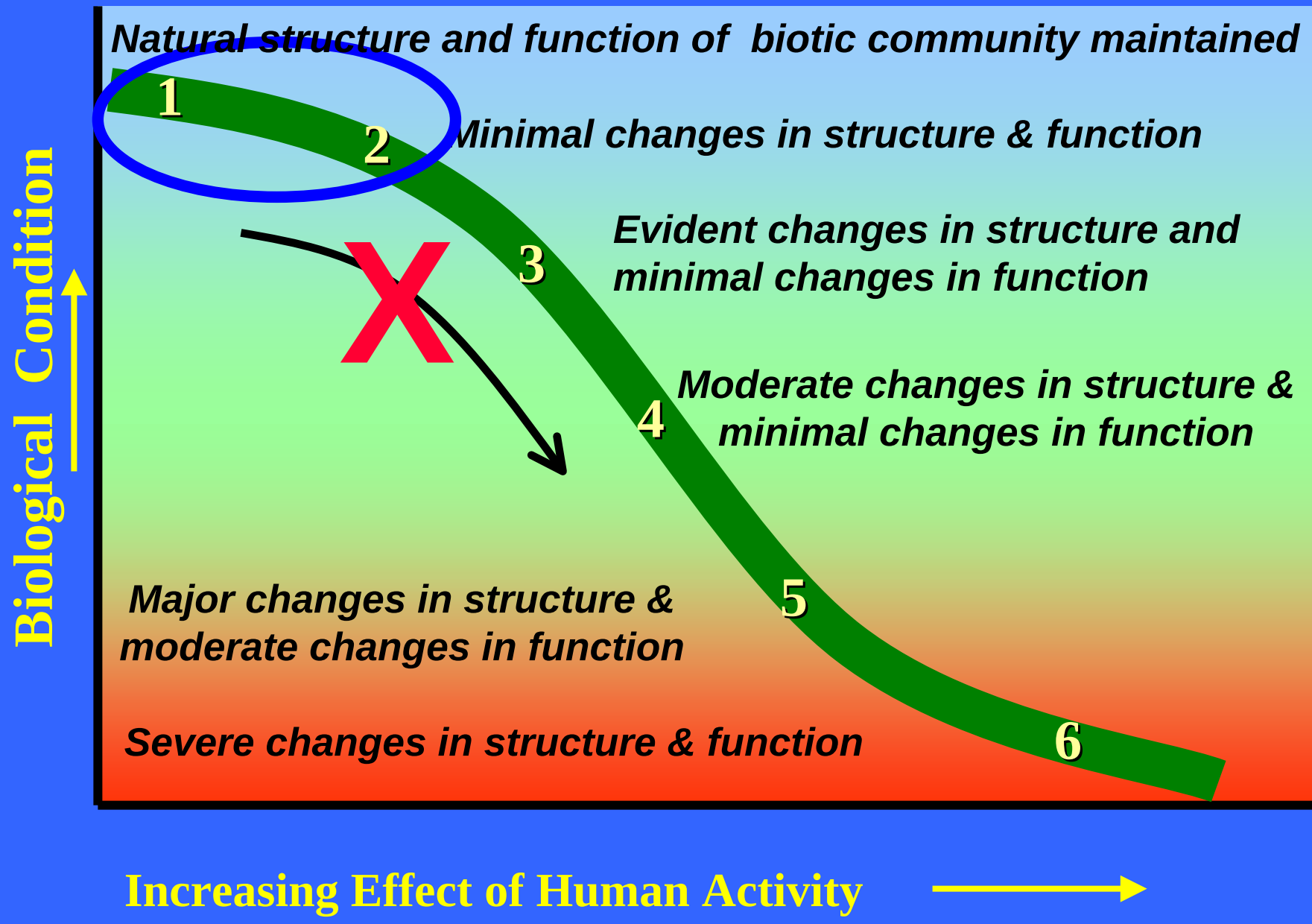
The Biological Condition Gradient



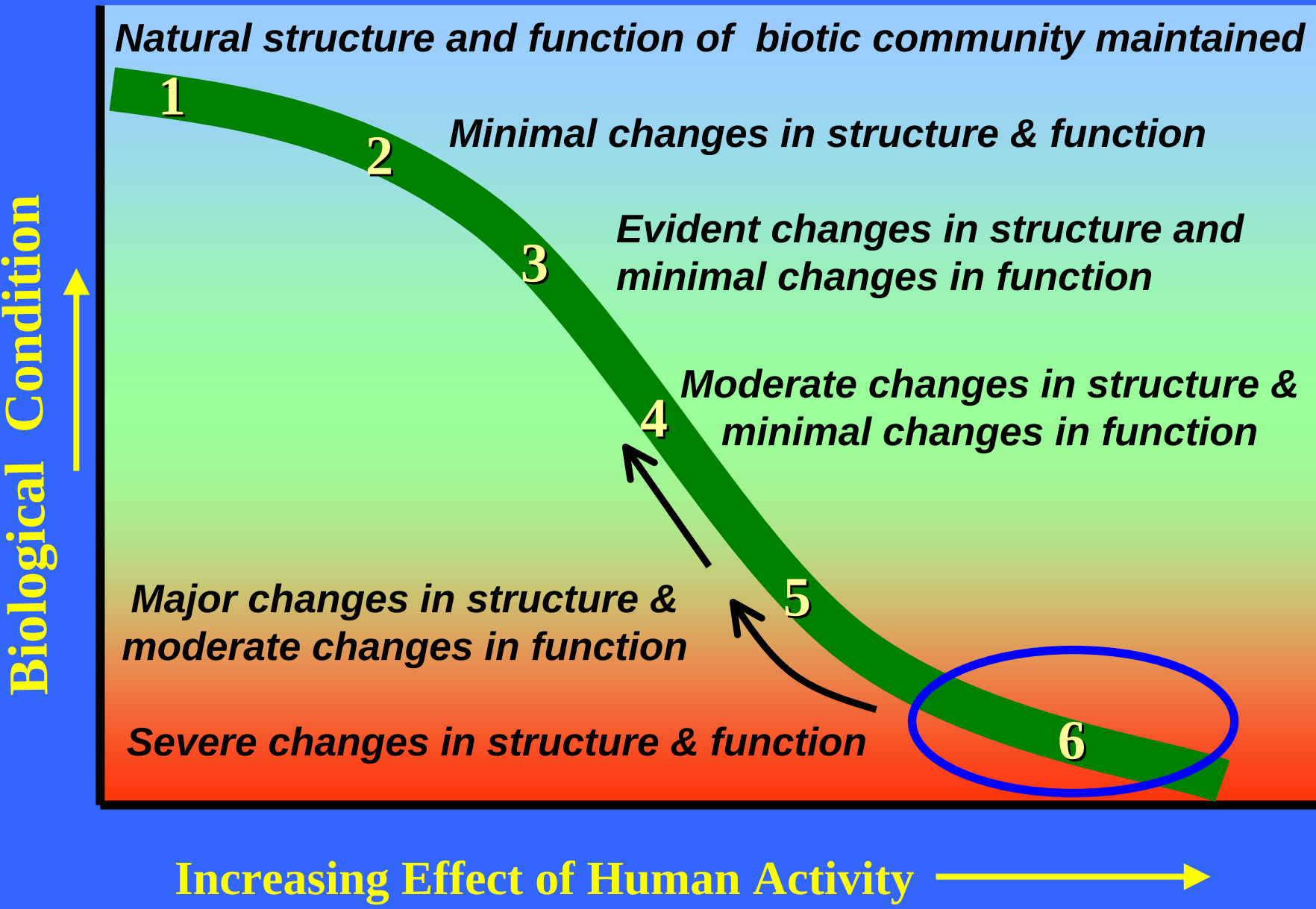
The Biological Condition Gradient



Biological Condition Gradient-Protect HQ Waters



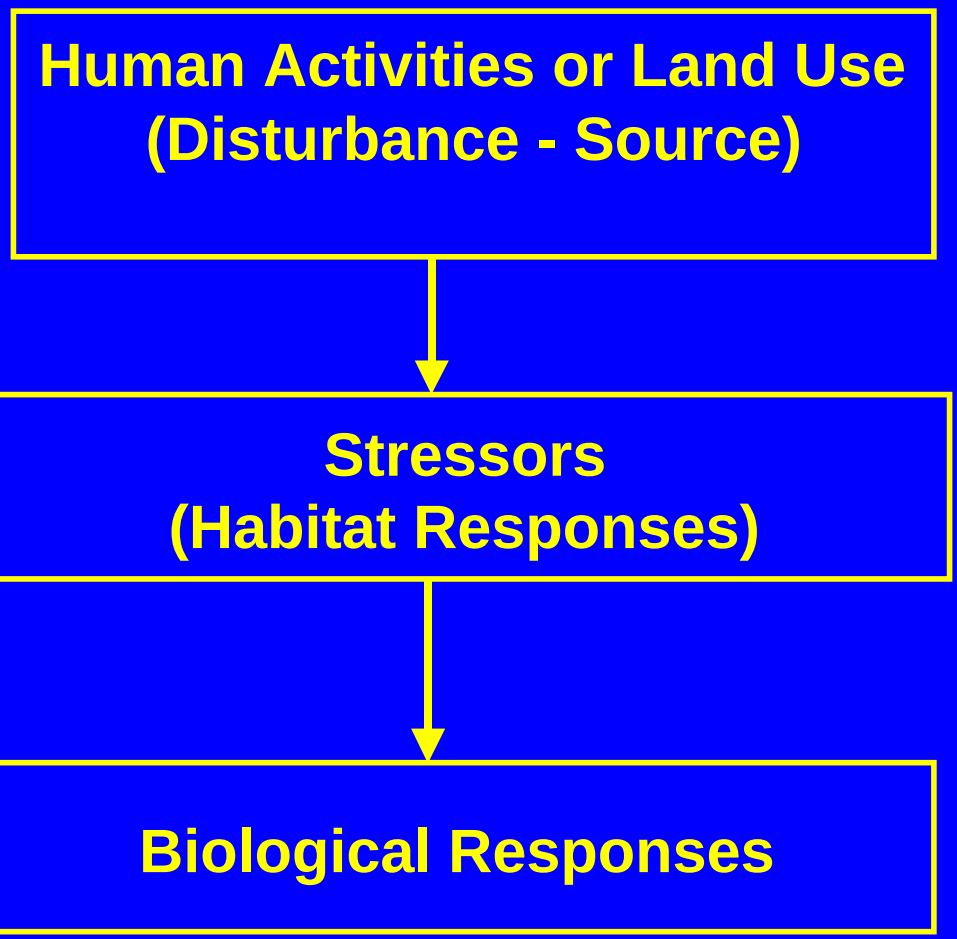
Biological Condition Gradient – Incremental Goals



Southern California and the BCG

- What represents least or minimally impaired conditions in Los Angeles? highly modified; major urban land uses; water quantity
- Some specific attributes of the BCG may not apply to these systems (sensitive taxa?)
- BCG needs robust and sensitive bioassessment indicators– do they exist for arid, urban streams?
- How to reconcile less sensitive mid-watershed biological assemblages with more sensitive biology in estuarine areas.

Human Disturbance Gradient (HDG)



Rationale for HDG

- Conceptual framework like BCG – details are **region or ecotype-specific**
- Essential for determining reference sites & minimal disturbance category – minimal disturbance?
- Necessary for metric & index development & evaluation
- Easier to implement than large suite of stressors
- Assists in diagnosing stressors
- Source of most-manageable stressors
- Critical for stream protection, BMPs & restoration

HDG Layout

- Six tiers (A – F)
- Six major stressor classes
  - Habitat structure
  - Flow regime
  - Water Quality
  - Toxics and engineered chemicals
  - Water Quality
  - Energy Sources
  - Biotic Interactions

HDG Layout

Six major disturbance classes:

- **Riparian corridor**
- **Landscape character**
- **Barriers**
- **Atmospheric deposition**
- **Biotic interactions**
- **Channel Morphology (map scale)**

Increasing Disturbance

Agriculture	Urbanization/Mining	Flow	Tier
	Industrial Mines Dominant Urban Dominant	Extreme Flows Only Inter-basin Transfers	F
Irrigated Rowcrops CAFOs; Crop Processors	Suburban Mines Common	Regulated Flows Only Intra-basin Transfers	E
Intense Riparian Grazing Irrigated Forage	Small Cities Industrial Mines Present	Dammed Local Transfers	D
Constant Grazing Dryland Agriculture	Large Lot Residential Small Metal/Aggregate Mines	Slightly Flashier	C
Light/Rotated Grazing	Rural Residential Hand Mines	Natural Flow	B
Natural Vegetation	Transients	Natural Flow	A

TALU Integrates the BCG and HDG

- Relate biological condition to measures of HDG
- Helps define what might be attainable given specific human disturbance conditions and what is restorable.
- Separate natural from anthropogenic limiting factors

Southern CA and the HDG

- **May be difficult to define more than a very few categories in the HDG due to past modifications and arid conditions**
- **Difficult to identify least disturbed condition on HDG**
- **HDG factors probably different between the coastal areas and more inland areas.**

Could tiers be implemented as biocriteria rather than new use designations?

- **--"waters designated WARM in hydrologic unit X.XX shall (insert biocriteria here)"**
- **Would not require Regional Boards to completely rework the Basin Plans**
- **Would not be subject to UAAs**
- **What about the tributary rule if we have an unnamed A level tributary to a C level river?**

From B. Reeves, CABW 2003

Next Steps

- **Convene a Technical Advisory Committee and a Stakeholder Advisory Committee**
- **Evaluate the applicability of the BCG and HDG conceptual models**
- **Recommend appropriate tiers of aquatic life**
- **Evaluate potential reference conditions for each tier**
- **Identify and address potential concerns**
- **Outline a preliminary framework for evaluating appropriate biocriteria and other water quality objectives for each tiered aquatic life use**