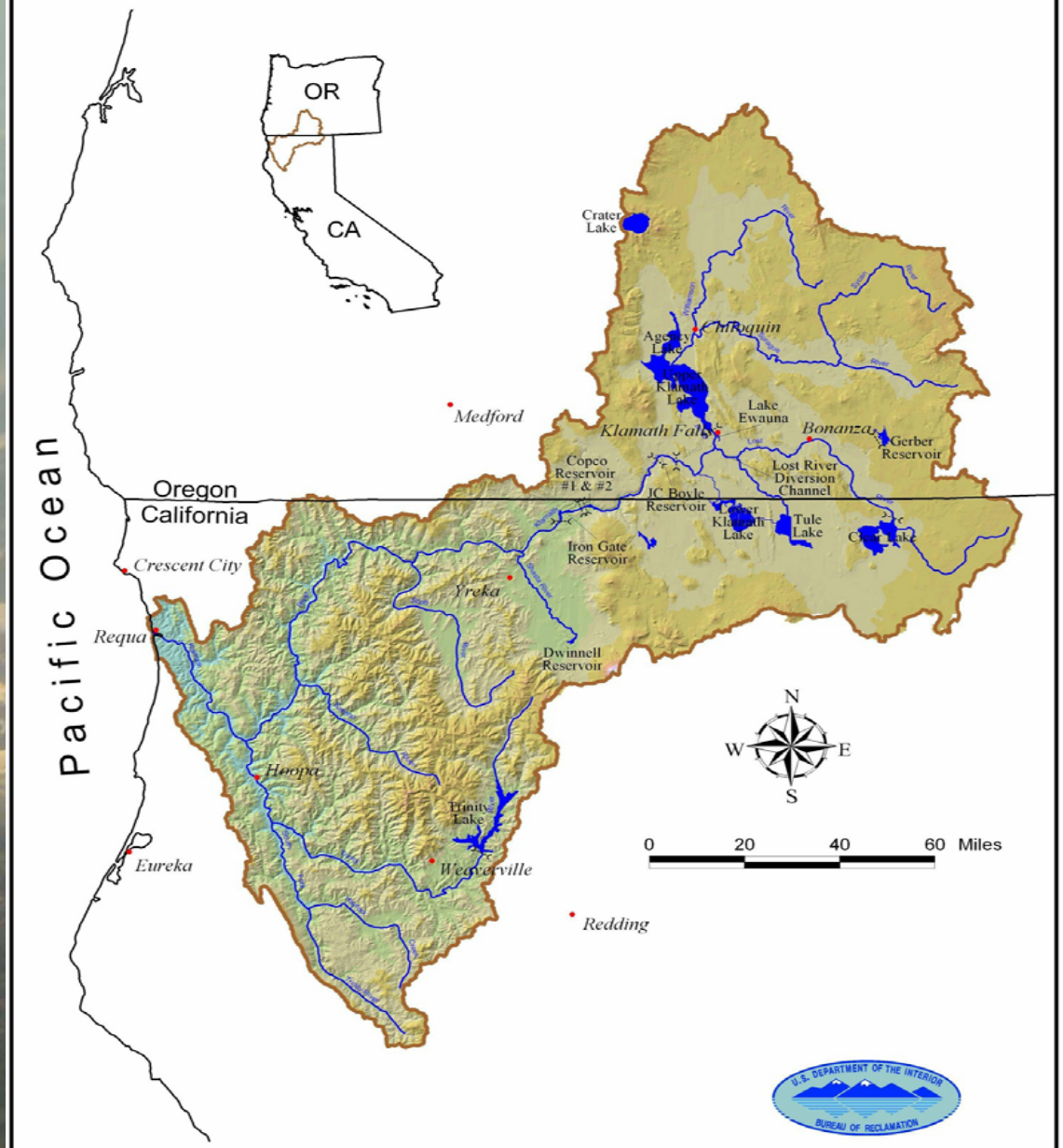
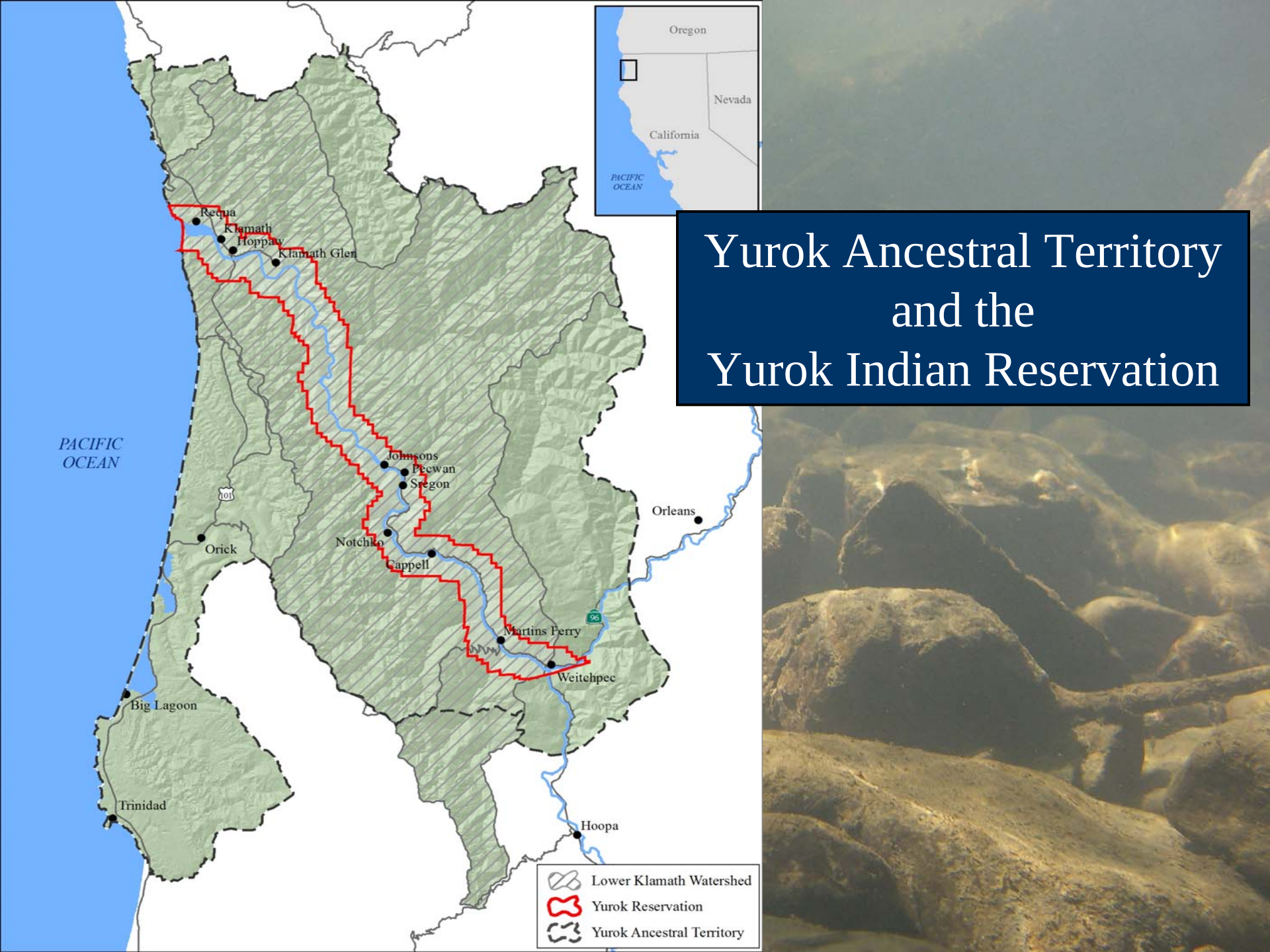
Yurok Tribe Environmental Program's Macroinvertebrate Sampling Program

2008 CABW UC Davis
November 20, 2008

Klamath River Basin



Compiled by M. Neuman, USBR Klamath Basin Area Office, 9/99



Yurok Ancestral Territory and the Yurok Indian Reservation

YTEP Mission

The mission of the Yurok Tribe Environmental Program (YTEP) is to assess, protect and restore Tribal natural resources through the exercise of high quality scientific practices in coordination with the community, Tribal departments, Tribal Council and adjacent jurisdictions.

Water Division (5 staff)

- Water Quality Monitoring, Assessment and Reporting
- Hydrologic Monitoring, Assessment and Reporting
- Water Quality Regulatory Program
- Watershed Based Environmental Education
- Workgroup(s) Participation
- Wetlands Inventory, Assessment and Conservation

Introduction to Macroinvertebrate Sampling Program

- US Congress Passes Hoopa-Yurok Settlement Act 1988
- Yurok Fisheries Program Completes Lower Klamath River Sub-basin Watershed Restoration Plan in 1999
- Yurok Fisheries and Watershed Restoration Programs actively implementing restoration projects on and off Yurok Indian Reservation
- Partnership with Green Diamond Resource Company

Objectives of Macroinvertebrate Sampling Program

- **Establish Baseline Conditions**
- **Track spatial and temporal trends**
- **Evaluate effects of management and restoration activities**

Site Selection Criteria

1. ***Spatial Distribution*** **- Sites located in the lower reaches of watersheds that characterize the water quality and watershed health condition throughout the lower Klamath. Areas chosen to monitor baseline and long-term trends.**

2. ***Activity Specific*** **-Sites located above and/or below herbicide applications and other activities that may potentially impact water quality.**

3. ***Watershed Restoration Activities*** **- Sites located in watersheds and sub-watersheds that have active or proposed restoration activities. Sites are selected to monitor the long-term trends by tracking the watershed's recovery.**

4. ***Proposed Future Development*** **- Sites near locations of resource and proposed resource development.**

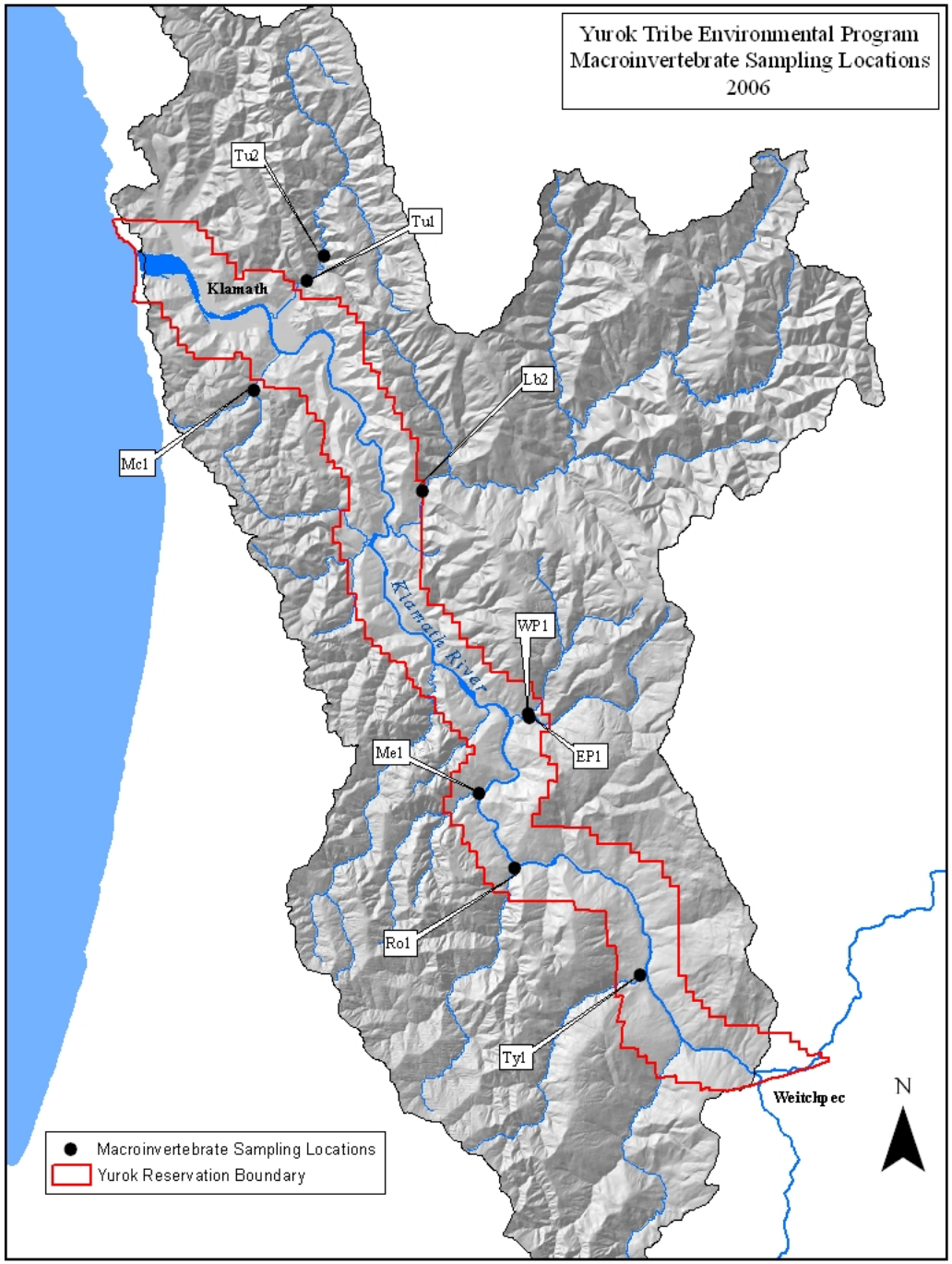
Site Selection Criteria Matrix

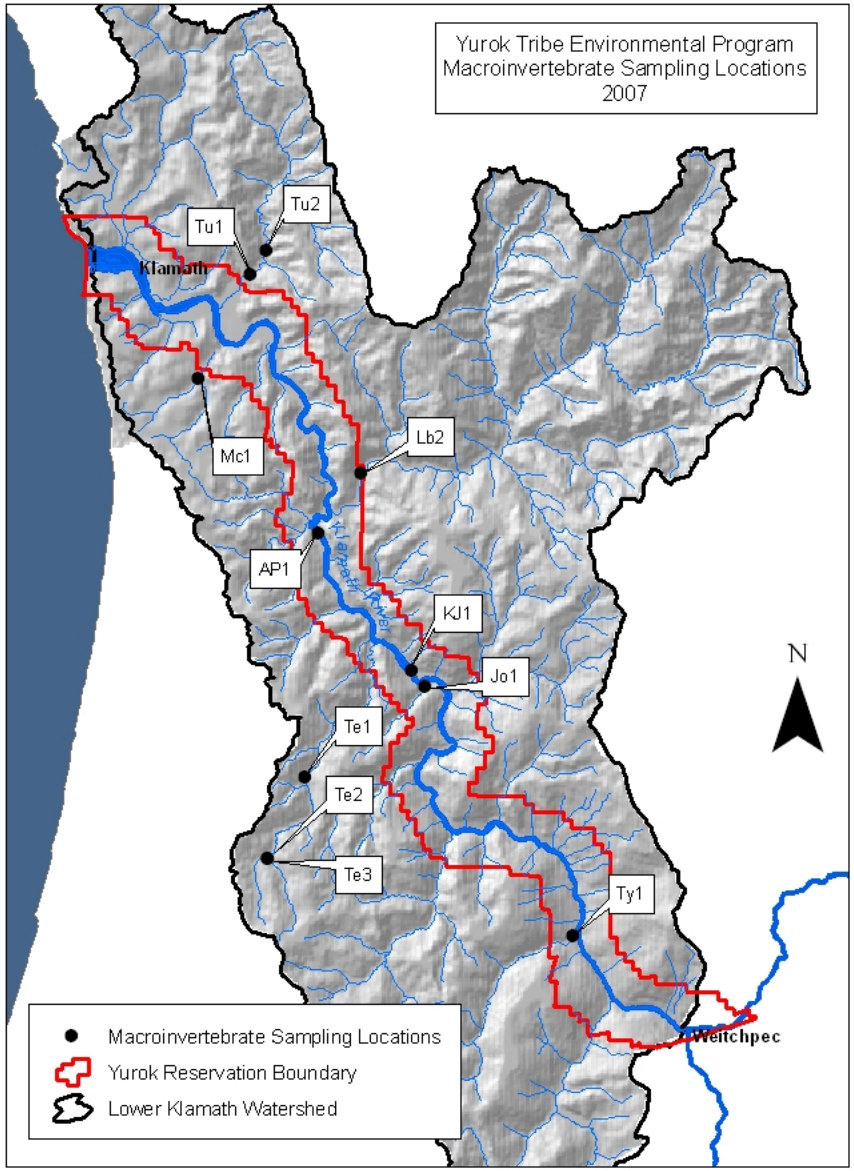
Stream Name	Primary Criteria	Secondary Criteria	Other	Sampling Frequency
Upper Turwar	1	3	2	Once a Year
Lower Turwar	1	3	2	Once a Year
McGarvey	3	1		Once a Year
Lower Blue	1	3	2	Once a Year
Tully	1	4	2	Once a Year
South Fork Tectah	3	1		Every other year
North Fork Tectah	3	1		Every other year
Mainstem Tectah	3	1		Every other year
Johnsons	2	1		Every other year
East Fork Pecwan	1	4		Every other year
West Fork Pecwan	1	4		Every other year
Mettah	3	1		Every other year
Roach	1	3		Every other year

1. Spatial Distribution
2. Activity Specific
3. Watershed Restoration
4. Proposed Development

Permanent Hydrologic Monitoring Stations

- Water level monitoring
- Turbidity and water temperature monitoring
- Stream flow measurements
- Suspended sediment concentration sampling
- YTFP performs fish population monitoring
- YTFP performs cross sectional and longitudinal channel profiles


Yurok Tribe Environmental Program
Macroinvertebrate Sampling Locations
2006
Tu2
Tu1
Klamath
Lb2
Mc1
Klamath River
WP1
EP1
Me1
Ro1
Ty1
Weitchpec
N
Macroinvertebrate Sampling Locations
Yurok Reservation Boundary


Yurok Tribe Environmental Program
Macroinvertebrate Sampling Locations
2007
Tu1
Tu2
Klamath
Mc1
Lb2
AP1
KJ1
Jo1
Te1
Te2
Te3
Ty1
N
Weitchpec
Macroinvertebrate Sampling Locations
Yurok Reservation Boundary
Lower Klamath Watershed

Field Methods

- **Sampling occurs under USEPA approved QAPP (2001) and Macroinvertebrate Sampling and Analysis Plan (2003)**

- **2001-2003 followed 1999 CSBP methods**
  - no defined reach length sample 3 riffles out of 5, selected randomly

- **2004 and 2005 adopted 2003 CSBP methods**
  - 100 meter reach 3 transects selected randomly in riffle habitat
  -DF&G held training in Klamath, Spring 2004

- **2006 - 2008 adopted SWAMP Bioassessment Procedures**
  - 150 meter reach Multi-Habitat Method every 15 meters (11 kicks total) P-Hab is more quantitative

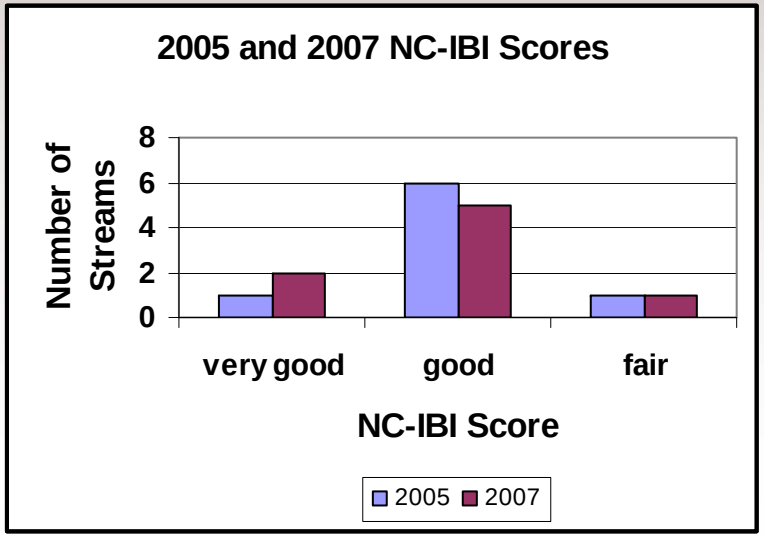
- **Mainstem sampling still uses 2003 CSBP Methods**

Lab Methods

- Jon Lee Consulting Since 2001
- Level 1 Taxonomic Effort
- IDs insects to genus level
- Chironomidae to subfamily and tribe
- Where interesting noted species
- Uses level 1 for the metric calculations
- NC IBI metric calculations with results
- 2004, 2005 and 2006 Data Reviewed by DF&G- Brady Richards
- **“Overall taxonomy was very good and performed in accordance with the California Stream Bioassessment Procedure (CSBP) Level I standards”**

North Coast IBI RESULTS

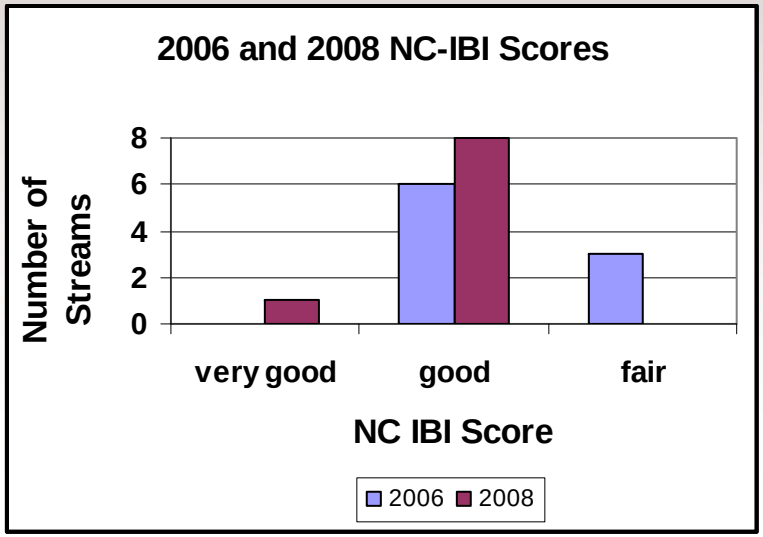
Stream Site	Date	NC-IBI Score	Stream Site	Date	NC-IBI Score
Upper Turwar	5/2/05	68.75	Upper Turwar	4/25/07	77.5
McGarvey	3/9/05	73.75			
McGarvey	4/28/05	67.5	McGarvey	4/16/07	66.25
Blue	7/6/05	53.75	Blue	6/7/07	66.25
Tully	7/5/05	65	Tully	6/1/07	80
NF Tectah	5/24/05	80	NF Tectah	5/9/07	77.5
SF Tectah	5/24/05	77.5	SF Tectah	5/9/07	87.5
Tectah Main	5/25/05	88.75	Tectah Main	5/10/07	82.5
Johnsons	5/23/05	72.5	Johnsons	5/8/07	57.5
*Targetted riffle method			*Switched to Multi-hab method		



Total Metric Score	Value
0-20	very poor
21-40	poor
41-60	fair
61-80	good
81-100	very good
> 52	"unimpaired"

North Coast IBI RESULTS

Stream Site	Date	NC-IBI Score	Stream Site	Date	NC-IBI Score
Upper Turwar	4/14/06	78.75	Upper Turwar	4/28/08	71.25
Lower Turwar	4/28/06	45	Lower Turwar	4/30/08	70
McGarvey	4/27/06	70	McGarvey	4/16/08	71.25
Blue	6/8/06	68.75	Blue	7/8/08	63.75
Tully	6/16/06	60	Tully	5/1/08	78.75
EF Pecwan	5/10/06	71.25	EF Pecwan	5/30/08	88.75
WF Pecwan	5/10/06	78.75	WF Pecwan	5/30/08	76.25
Mettah	6/22/06	57.5	Mettah	4/21/08	70
Roach	6/22/06	62.5	Roach	6/27/08	75
*Multi-hab method			*Multi-hab method		



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Rare Specimen Notes

- **Upper Turwar Creek 4-28-08** odd dipteran (fly) larva characteristics of the families Psychodidae and Tipulidae previously found in Consumnes River- taxonomists can't figure out which family to place them in
- **SF Tectah Creek 5-9-07** *Oreoleptis* (diptera) larva previously described in 2005 from Northern Rocky Mtns and is known from N. ID and MT to the Yukon = range extension
- **Trinity River at Weitchpec 8-20-04** very distinct male nymph mayfly *Homoleptohyphes dimorphus* known to occur in Sierra Nevada Mtn streams was not in literature as occurring in CA

- Mayfly *Drunella pelosa* has been collected at several Yurok streams seems to be fairly rare
- Interesting stoneflys in Turwar Creek samples *Isoperla marmorata*

Macroinvertebrate Sampling – Great Tool For Environmental Education

Questions/Comments??

Blue Creek June 2006