SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA AMPHIBIAN MONITORING PROGRAM

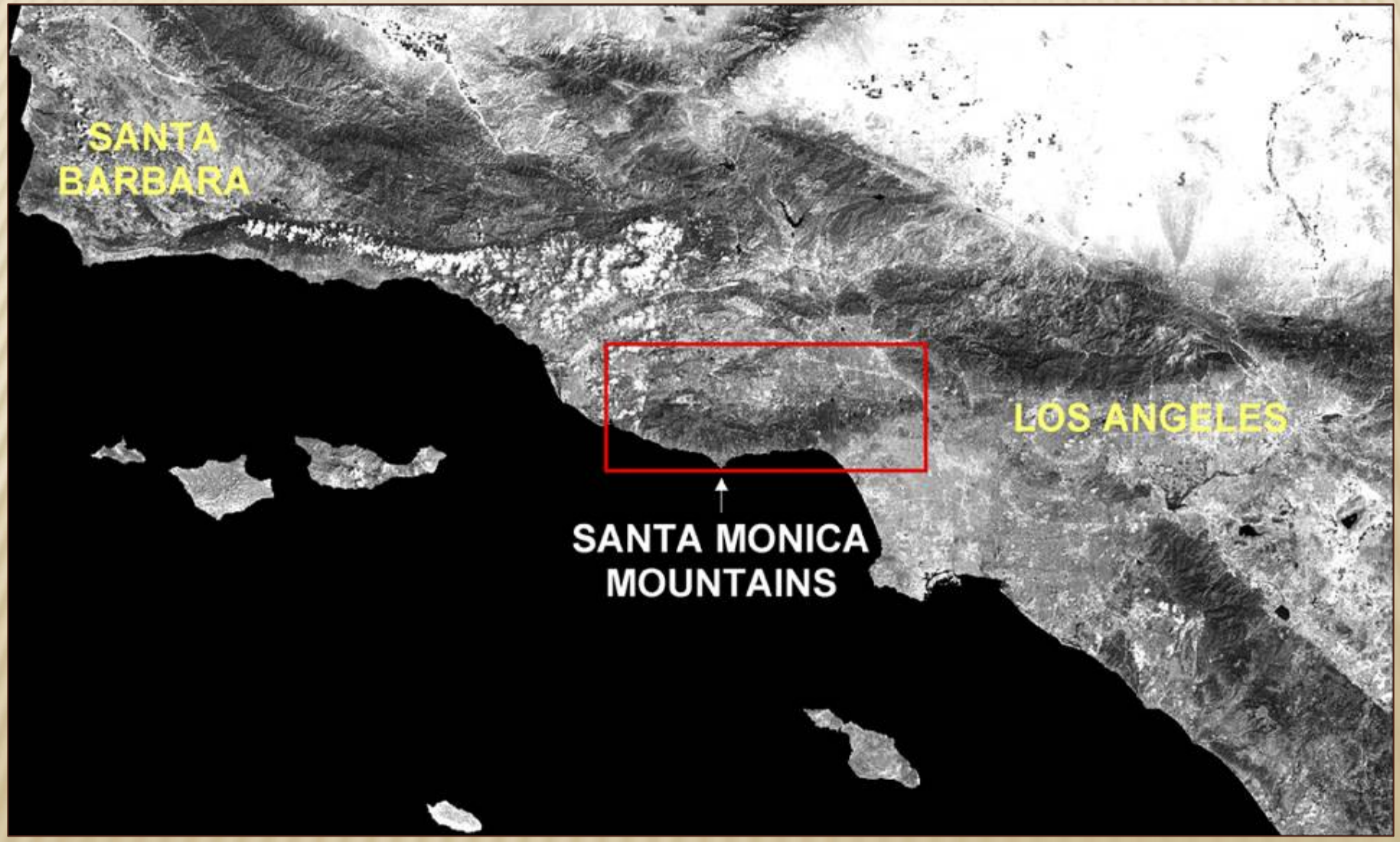
RCD

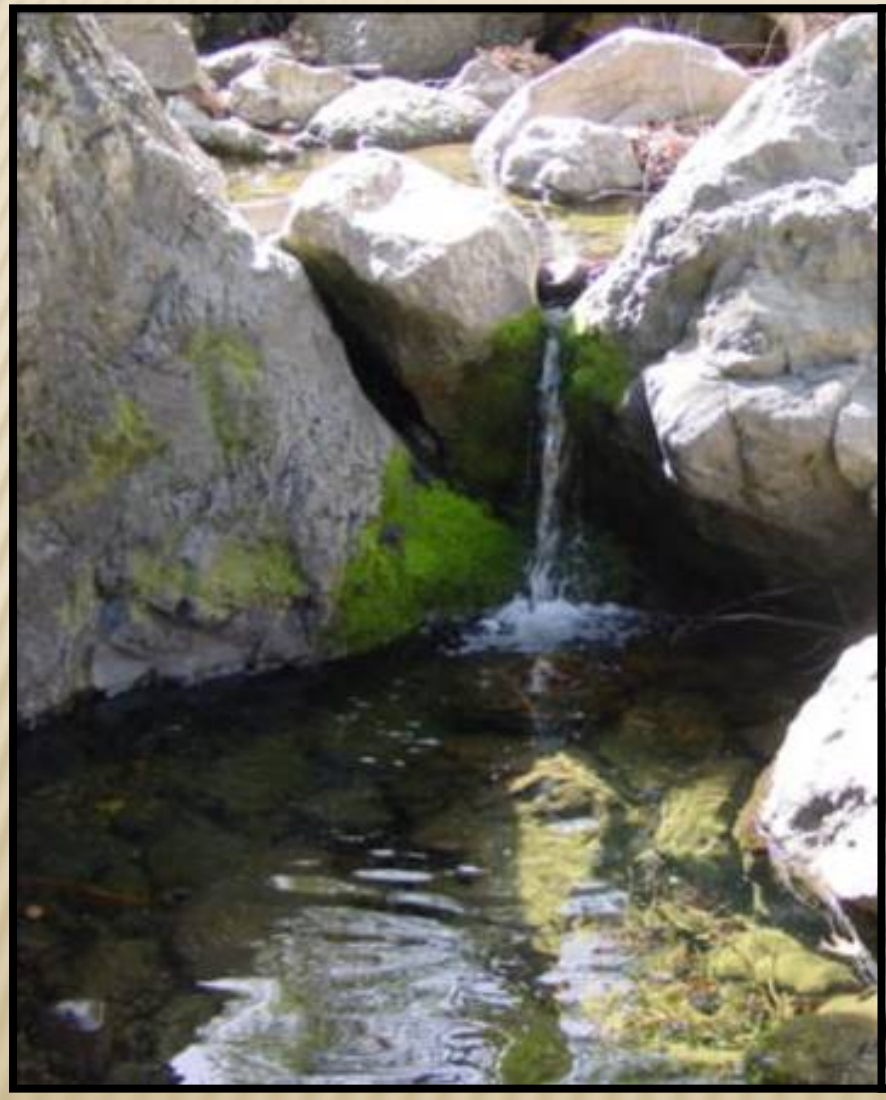
PEPPERDINE UNIVERSITY

Strengthening Lives for Purpose, Service, and Leadership

USGS

science for a changing world


SANTA
BARBARA
LOS ANGELES
SANTA MONICA
MOUNTAINS



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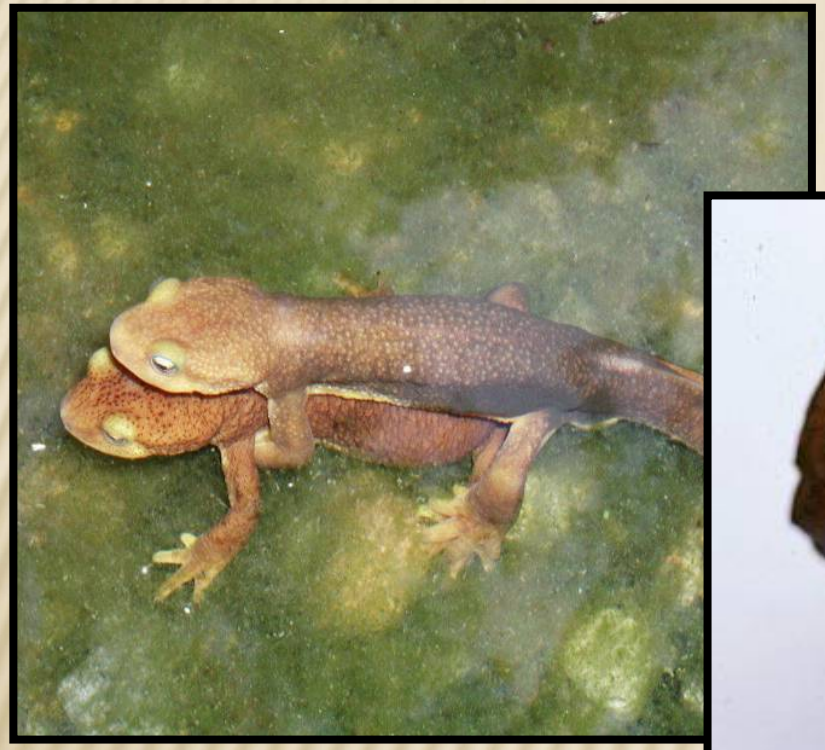
PEPPERDINE UNIVERSITY NEWT STUDY

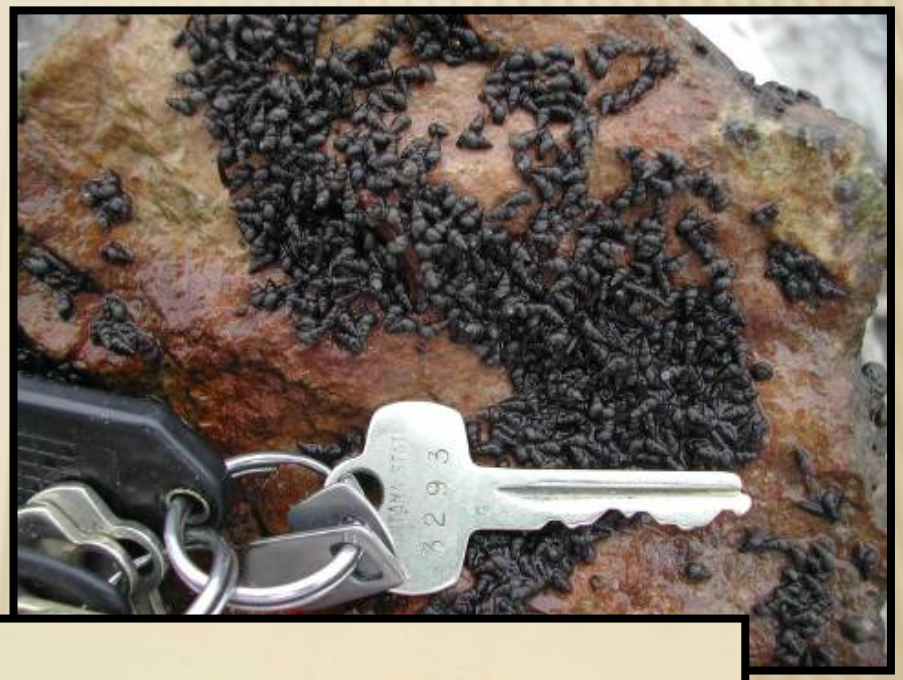


ANTHROPOGENIC FIRES

URBAN ENCROACHMENT AND HABITAT FRAGMENTATION

HABITAT ALTERATION

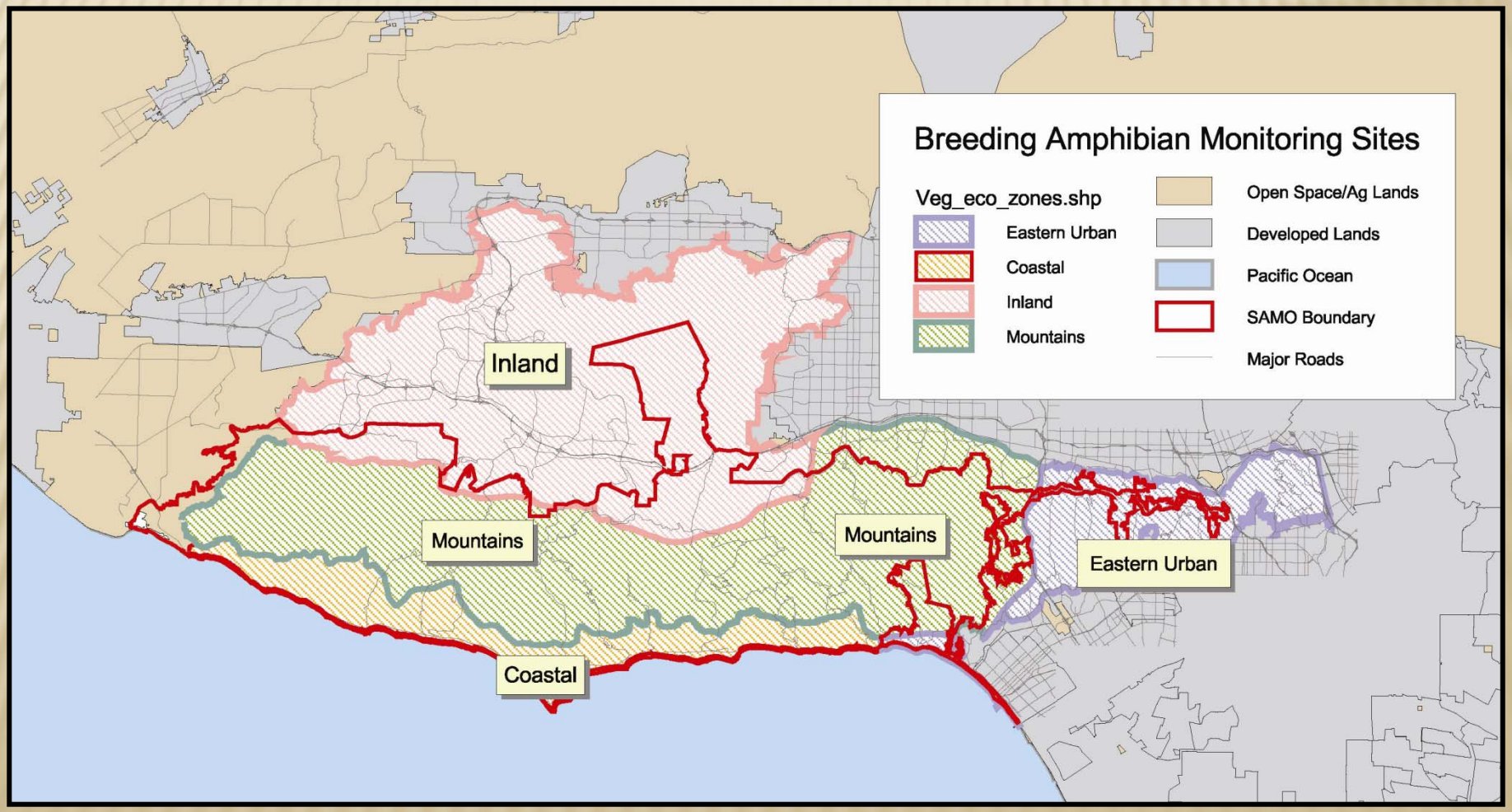
EXOTIC SPECIES



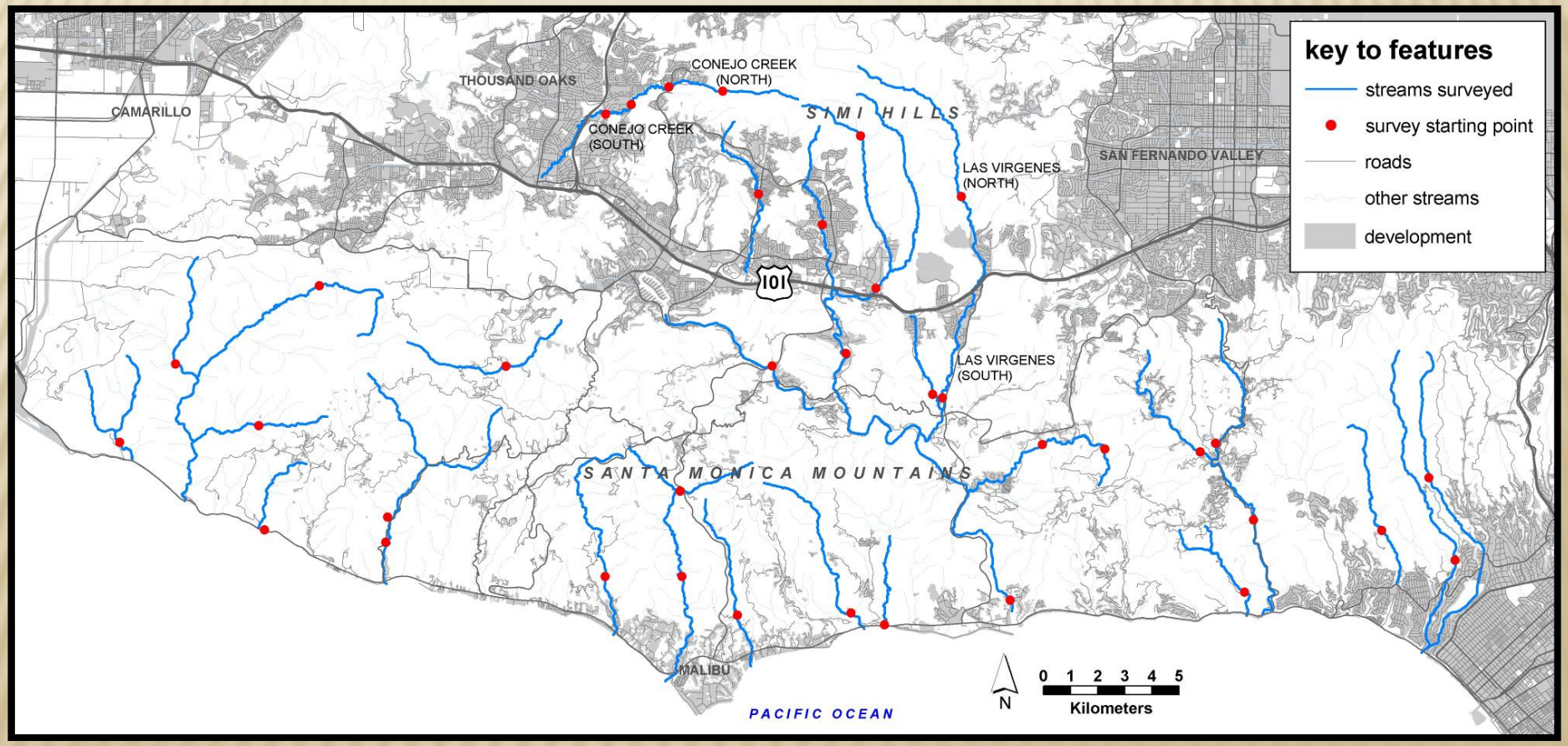
AMPHIBIANS OF THE SANTA MONICA MOUNTAINS

SANTA MONICA MOUNTAINS NRA

SAMO RESOURCE MANAGEMENT ZONE



AMPHIBIAN INVENTORY

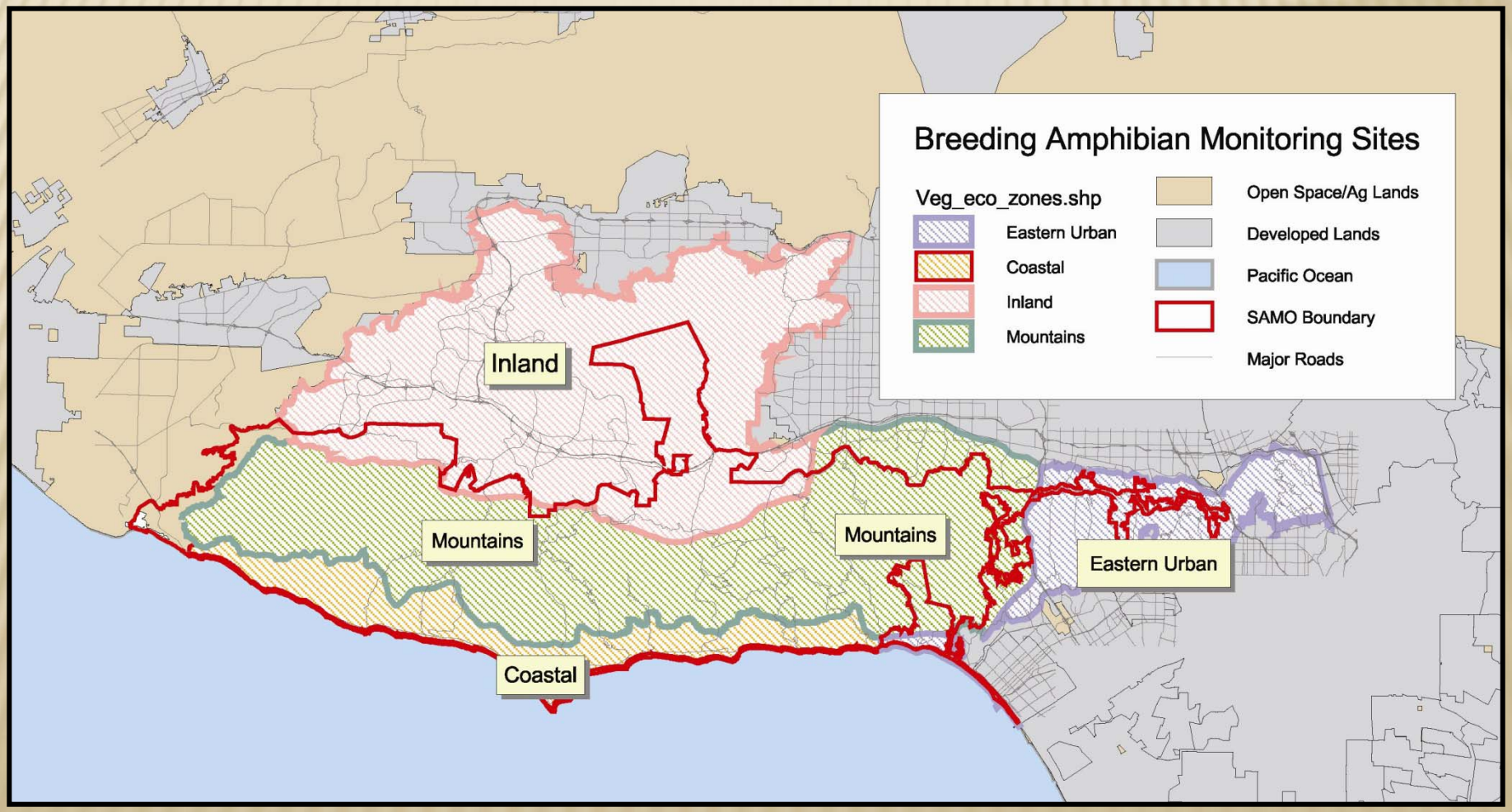


SAMPLING PROTOCOLS

- Visit Each Site Once a Year
- Walk a 500 meter stretch at each location
- Abundance
  - Adults – total counts
  - Larvae/Juveniles – abundance class (<5, 5-20, 20-100, etc.)
  - Egg masses – total counts
  - Non-native spp. – abundance class
- Physical Characteristics
  - Run, Riffle, Pool or Dry
  - Flow
- Chemical
  - DO, pH, conductivity, turbidity

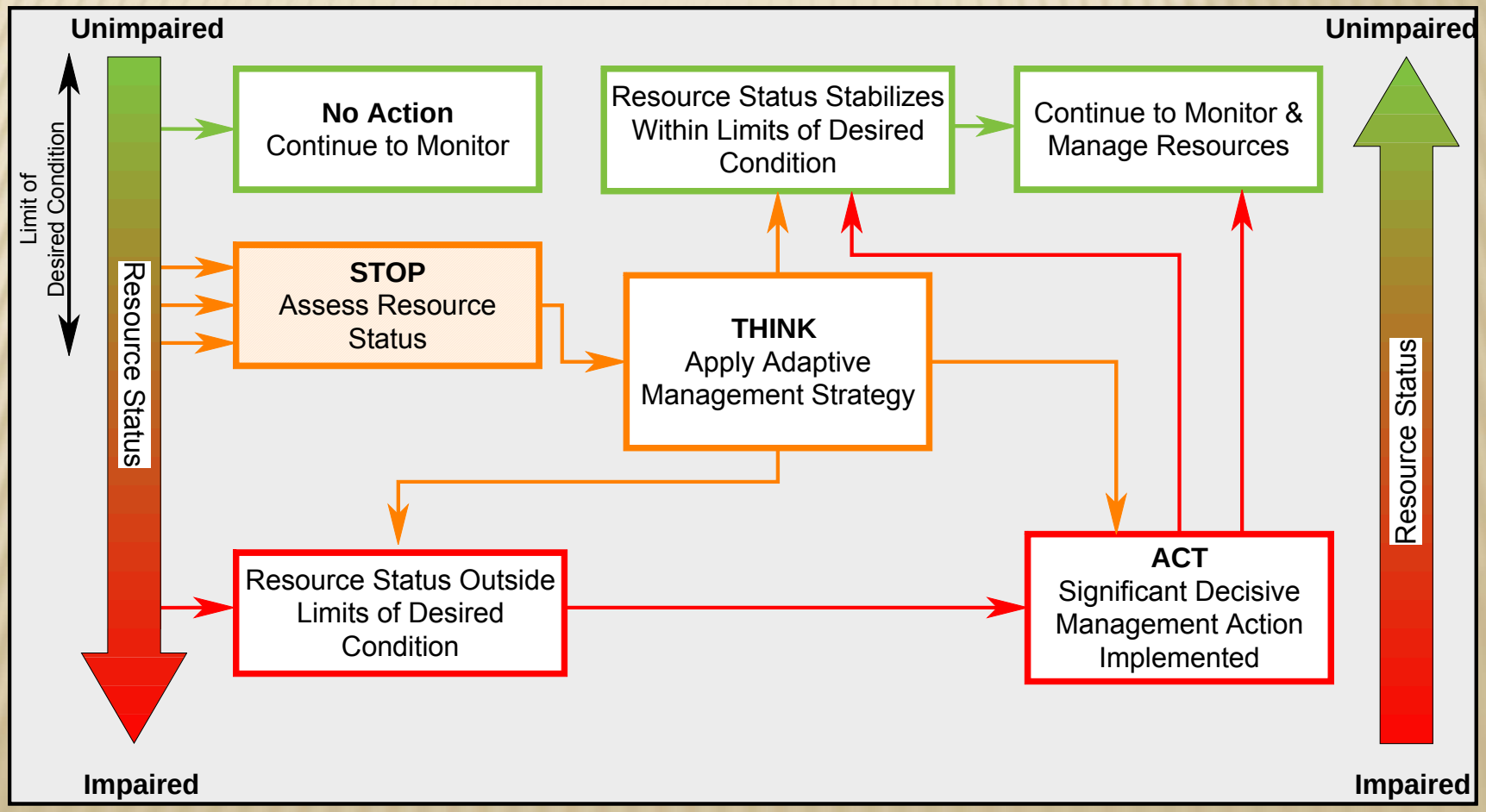
- Determine Species Detectability
- Maintain Sampling Efforts Year to Year – Annual Protocol Modifications (new streams, dropping BMI, shortening stream reach)
- Different Objectives and Goals
  - Species Specific (Pepperdine University)
  - Watershed Specific (RCD)
  - Park Specific (NPS)

SAMO RESOURCE MANAGEMENT ZONE



How Might This Relate to Vital Signs Monitoring?

Adaptive Management for Monitoring Vital Signs



OUR ABILITY TO MANAGE BASED ON MONITORING IS CONTINGENT ON:

The Data

Data Must Meet Some Level
of Desired Quality and Reliability

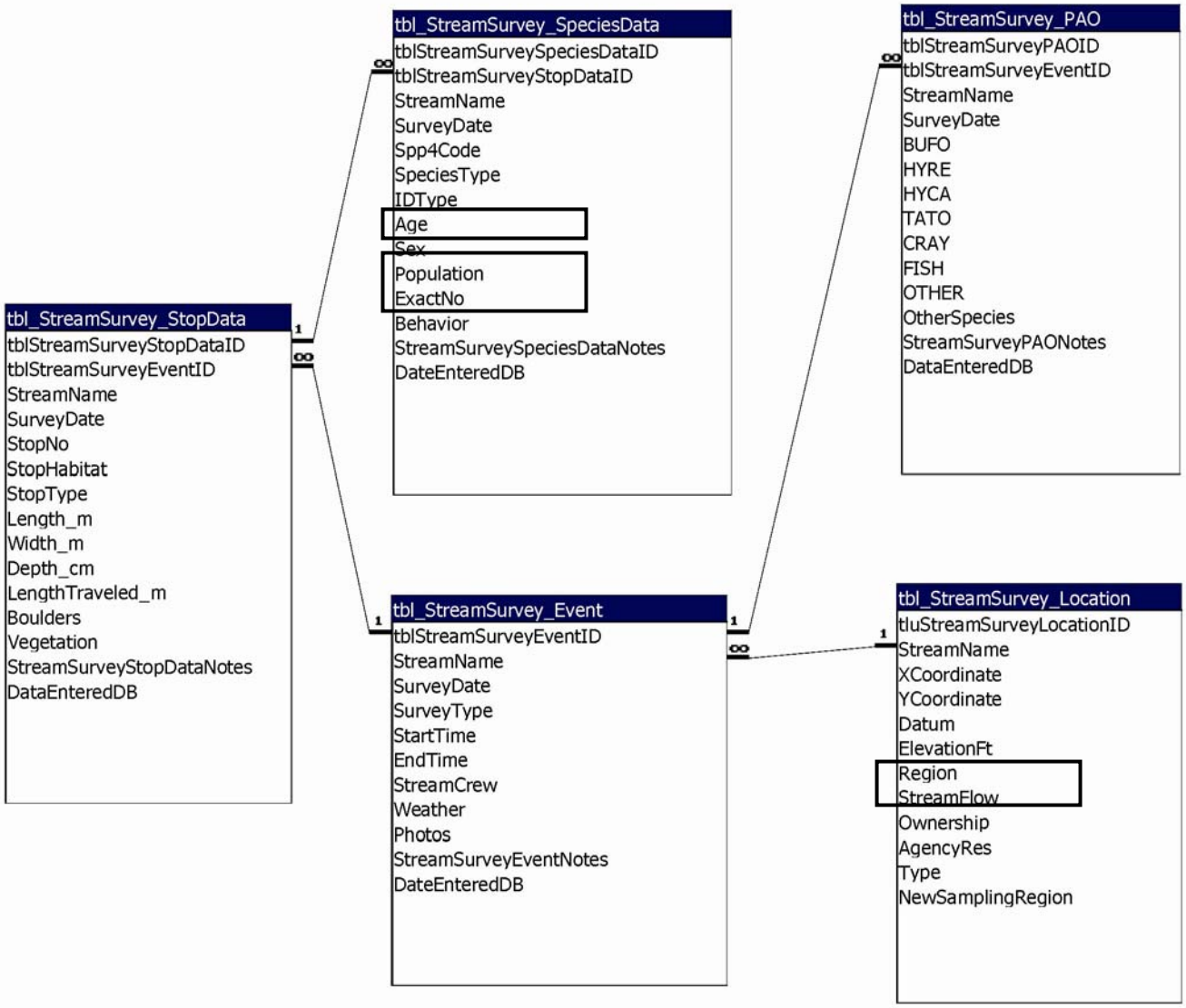
What is QA/QC? From Wikipedia:

Quality assurance is the activity of providing evidence needed to establish quality in work, and that activities that require good quality are being performed effectively. All those planned or systematic actions necessary to provide enough confidence that a product or service will satisfy the given requirements for quality.

Quality control is developing systems to ensure products or services are designed and produced to meet or exceed customer requirements. These systems are often developed in conjunction with other business and engineering disciplines using a cross-functional approach.

Relationships for StreamSurveys_MSAccess2K

Wednesday, June 27, 2007



StreamSurveys MSAccess2K : Database (Acc

tbl_StreamSurvey_SpeciesData : Table

Field Name	Data Type	
tblStreamSurveySpeciesDataID	AutoNumber	
tblStreamSurveyStopDataID	Number	
StreamName	Text	stream name
SurveyDate	Date/Time	survey date
Spp4Code	Text	4-letter species code
SpeciesType	Text	if species is unknown, then type of species
IDType	Text	identification type: visual (default) or audio
Age	Text	age **Class**
Sex	Text	sex of animals observed (M/F)
Population	Text	estimated number of animals observed
ExactNo	Number	exact number of animals observed, if known
Behavior	Text	behavior observed
StreamSurveySpeciesDataNote	Memo	additional comments
DateEnteredDB	Date/Time	database entry date

tbl_StreamSurvey_SpeciesData

- tblStreamSurveySpeciesDataID
- tblStreamSurveyStopDataID
- StreamName
- SurveyDate
- Spp4Code
- SpeciesType
- IDType
- Age
- Sex
- Population
- ExactNo
- Behavior
- StreamSurveySpeciesDataNo
- DateEnteredDB

PopulationClass	PopulationValue	PopnClass4Analysis	UpperValue	LowerValue
?	0	?	0	0
>500	500	>500	500	0
NA	0	NA	0	0
<5	1	<5	5	1
>20	20	5-20	20	5
10-20	10	5-20	20	5
5-10	5	5-20	20	5
5-20	5	5-20	20	5
20-30	20	21-100	100	21
20-50	20	21-100	100	21
21-100	21	21-100	100	21
21-50	21	21-100	100	21
50-100	50	21-100	100	21
>100	100	101-500	500	101
100-500	100	101-500	500	101
101-500	101	101-500	500	101
>1000	1000	>500	1000	500
500-1000	500	>500	1000	500

Inconsistency in Data Entry

StreamName	SpeciesCode	Age	Year	SumOfPopulationValue	SumOfExactNo
Carlisle Canyon	BUBO	Larvae	2000	34	9
Carlisle Canyon	BUBO	Larvae	2001	100	
Carlisle Canyon	BUBO	Larvae	2003	12	21
Carlisle Canyon	BUBO	Larvae	2005	156	209
Carlisle Canyon	BUBO	Larvae	2006	1	
Cheeseboro Canyon	BUBO	Larvae	2000	51	5
Cheeseboro Canyon	BUBO	Larvae	2001	195	31
Cheeseboro Canyon	BUBO	Larvae	2003	866	357
Cheeseboro Canyon	BUBO	Larvae	2006	7	
Corral Canyon	BUBO	Larvae	2001	100	
Deer Creek	BUBO	Larvae	2003	50	
Las Virgenes (N)	BUBO	Larvae	2005	311	19
Las Virgenes (S)	BUBO	Larvae	2000	46	20
Medea Creek (S)	BUBO	Larvae	2001	291	21
Old Topanga Canyon	BUBO	Larvae	2000	41	
Old Topanga Canyon	BUBO	Larvae	2001	2276	10
Old Topanga Canyon	BUBO	Larvae	2004	2860	13550
Old Topanga Canyon	BUBO	Larvae	2005	1196	417
Old Topanga Canyon	BUBO	Larvae	2006	2032	2
Palo Comado Canyon	BUBO	Larvae	2001	822	50
Topanga Canyon (Lower)	BUBO	Larvae	2000	30	
Topanga Canyon (Lower)	BUBO	Larvae	2001	336	54
Topanga Canyon (Lower)	BUBO	Larvae	2005	7	12
Topanga Canyon (Upper)	BUBO	Larvae	2000	20	
Topanga Canyon (Upper)	BUBO	Larvae	2001	1670	
Topanga Canyon (Upper)	BUBO	Larvae	2004	1161	2510
Triunfo Canyon	BUBO	Larvae	2001	170	

Sampling Record

StreamName	2000	2001	2002	2003	2004	2005	2006
Arroyo Sequit (Lower)	●	●	●	●	●	○	●
Arroyo Sequit (Upper)	●	●	●	●	●	●	○
Bell Canyon	○	○	○	○	○	○	●
Big Sycamore Canyon	●	●	●	●	●	●	●
Carlisle Canyon	●	●	●	●	●	●	●
Cheeseboro Canyon	●	●	●	●	●	○	●
Cold Creek (Lower)	●	●	●	●	●	●	○
Cold Creek (Upper)	●	●	●	●	●	○	○
Corral Canyon	●	●	●	●	●	○	○
Deer Creek	●	●	●	●	●	○	○
Erbes (Lower)	○	●	●	●	●	●	●
Erbes (Upper)	○	●	●	●	●	○	○
La Jolla Canyon	●	●	●	●	●	○	○
Lang Ranch (N)	●	●	●	●	●	●	●
Lang Ranch (S)	●	●	●	●	○	○	○
Las Virgenes (N)	●	●	●	●	●	●	●
Las Virgenes (S)	●	●	●	●	●	●	●
Liberty Canyon (S)	●	●	●	●	●	○	○
Lindero Canyon	●	●	●	●	●	○	○
Malibu Canyon (Lower)	●	○	●	●	●	○	○
Medea Creek (N)	●	●	●	●	●	●	●
Medea Creek (S)	●	●	●	●	●	●	●
Newton Canyon	●	●	●	●	●	●	○
Old Topanga Canyon	●	●	●	●	●	●	●
Palo Comado Canyon	●	●	●	●	●	○	●
Ramirez Canyon	○	●	●	●	●	●	○
Rustic Canyon	○	●	●	●	●	○	○
Serrano Canyon	●	●	●	●	●	○	○
Solstice Canyon	●	●	●	●	●	●	●
Sullivan Canyon	○	●	●	●	●	○	○
Temescal Canyon	●	○	●	●	●	●	●
Topanga Canyon (Bottom)	○	○	○	○	●	○	○
Topanga Canyon (Lower)	●	●	●	●	●	●	●
Topanga Canyon (Upper)	●	●	●	●	●	●	●
Trancas Canyon	●	●	●	●	●	●	○
Triunfo Canyon	●	●	●	●	●	●	○
Tuna Canyon	○	●	●	●	●	●	○
Wood Canyon	●	●	●	●	●	○	○
Zuma Canyon	●	●	●	●	●	●	○

FISHES

StreamName	2000	2001	2002	2003	2004	2005	2006
Arroyo Sequit (Lower)	0	0	0	0	0	*	0
Arroyo Sequit (Upper)	0	0	0	0	0	0	*
Bell Canyon	*	*	*	*	*	*	156
Big Sycamore Canyon	0	0	0	0	0	0	0
Carlisle Canyon	0	0	0	0	0	0	0
Cheeseboro Canyon	0	0	0	0	0	*	0
Cold Creek (Lower)	0	0	0	0	0	0	*
Cold Creek (Upper)	0	0	0	0	0	*	*
Corral Canyon	0	0	0	0	0	*	*
Deer Creek	0	0	0	0	0	*	*
Erbes (Lower)	*	7	5	194	23	672	1
Erbes (Upper)	*	0	0	0	0	*	*
La Jolla Canyon	0	0	0	0	0	*	*
Lang Ranch (N)	2	0	0	0	0	0	0
Lang Ranch (S)	0	0	0	0	*	*	*
Las Virgenes (N)	0	0	0	0	0	0	0
Las Virgenes (S)	31	165	24	0	155	1646	129
Liberty Canyon (S)	0	0	0	0	0	*	*
Liero Canyon	2	10	49	1	83	*	*
Malibu Canyon (Lower)	95	*	1390	60	66	*	*
Medea Creek (N)	36	19	21	13	54	10	22
Medea Creek (S)	80	2	8	13	0	4	7
Newton Canyon	0	0	0	0	0	0	*
Old Topanga Canyon	1	25	10	0	1	0	9
Palo Comado Canyon	0	0	0	0	0	*	0
Ramirez Canyon	*	0	0	0	0	0	*
Rustic Canyon	*	0	0	0	0	*	*
Serrano Canyon	0	0	0	0	0	*	*
Solstice Canyon	0	0	0	0	0	0	0
Sullivan Canyon	*	0	0	0	0	*	*
Temescal Canyon	0	*	5	0	1	0	0
Topanga Canyon (Bottom)	*	*	*	*	155	*	*
Topanga Canyon (Lower)	90	0	3	12	1167	70	42
Topanga Canyon (Upper)	69	78	26	12	107	1	526
Trancas Canyon	0	0	0	0	0	0	*
Triunfo Canyon	27	113	5	130	127	95	*
Tuna Canyon	*	0	0	0	0	0	*
Wood Canyon	0	0	0	0	0	*	*
Zuma Canyon	1	0	0	0	0	0	*

HYCA ADULTS

StreamName	2000	2001	2002	2003	2004	2005	2006
Arroyo Sequit (Lower)	2	4	2	5	2	*	0
Arroyo Sequit (Upper)	8	10	0	11	21	8	*
Bell Canyon	*	*	*	*	*	*	0
Big Sycamore Canyon	2	8	3	4	0	0	0
Carlisle Canyon	28	33	13	13	7	4	1
Cheeseboro Canyon	0	0	0	0	0	*	0
Cold Creek (Lower)	7	12	5	8	8	0	*
Cold Creek (Upper)	2	17	1	11	17	*	*
Corral Canyon	0	0	0	0	0	*	*
Deer Creek	1	0	0	0	0	*	*
Erbes (Lower)	*	0	0	0	0	0	0
Erbes (Upper)	*	0	0	0	0	*	*
La Jolla Canyon	0	0	0	0	0	*	*
Lang Ranch (N)	0	0	0	0	0	0	0
Lang Ranch (S)	0	0	0	0	*	*	*
Las Virgenes (N)	0	0	0	0	0	0	0
Las Virgenes (S)	0	0	0	0	0	0	0
Liberty Canyon (S)	0	0	0	0	0	*	*
Lindero Canyon	0	0	0	0	0	*	*
Malibu Canyon (Lower)	0	*	0	0	0	*	*
Medea Creek (N)	0	0	0	0	0	0	0
Medea Creek (S)	0	0	0	0	0	0	0
Newton Canyon	0	0	0	0	0	0	*
Old Topanga Canyon	0	0	0	0	0	0	1
Palo Comado Canyon	0	0	0	0	0	*	0
Ramirez Canyon	*	5	2	2	2	21	*
Rustic Canyon	*	0	0	0	0	*	*
Serrano Canyon	0	8	1	0	0	*	*
Solstice Canyon	7	3	0	0	0	6	0
Sullivan Canyon	*	0	0	0	0	*	*
Temescal Canyon	2	*	0	0	0	1	0
Topanga Canyon (Bottom)	*	*	*	*	1	*	*
Topanga Canyon (Lower)	3	7	10	0	4	3	1
Topanga Canyon (Upper)	1	0	0	0	0	0	7
Trancas Canyon	27	31	2	12	2	16	*
Triunfo Canyon	0	0	0	0	0	0	*
Tuna Canyon	*	8	1	0	1	3	*
Wood Canyon	0	0	0	0	0	*	*
Zuma Canyon	10	1	2	0	0	47	*

HYCA JUVENILES

StreamName	2000	2001	2002	2003	2004	2005	2006
Arroyo Sequit (Lower)	0	0	0	0	0	*	0
Arroyo Sequit (Upper)	0	0	0	0	0	0	*
Bell Canyon	*	*	*	*	*	*	0
Big Sycamore Canyon	0	0	0	0	0	0	0
Carlisle Canyon	0	0	0	0	0	0	0
Cheeseboro Canyon	0	0	0	0	0	*	0
Cold Creek (Lower)	0	0	0	0	0	0	*
Cold Creek (Upper)	0	0	0	0	0	*	*
Corral Canyon	0	0	0	0	0	*	*
Deer Creek	0	5	0	0	0	*	*
Erbes (Lower)	*	0	0	0	0	0	0
Erbes (Upper)	*	0	0	0	0	*	*
La Jolla Canyon	0	0	0	0	0	*	*
Lang Ranch (N)	0	0	0	0	0	0	0
Lang Ranch (S)	0	0	0	0	*	*	*
Las Virgenes (N)	0	0	0	0	0	0	0
Las Virgenes (S)	0	0	0	0	0	0	0
Liberty Canyon (S)	0	0	0	0	0	*	*
Lindero Canyon	0	0	0	0	0	*	*
Malibu Canyon (Lower)	0	*	0	0	0	*	*
Medea Creek (N)	0	0	0	0	0	0	0
Medea Creek (S)	0	0	0	0	0	0	0
Newton Canyon	0	0	0	0	0	0	*
Old Topanga Canyon	0	0	0	0	0	0	0
Palo Comado Canyon	0	0	0	0	0	*	0
Ramirez Canyon	*	0	0	0	0	0	*
Rustic Canyon	*	0	0	0	0	*	*
Serrano Canyon	0	0	0	0	0	*	*
Solstice Canyon	0	0	0	0	0	0	0
Sullivan Canyon	*	0	0	0	0	*	*
Temescal Canyon	0	*	0	0	0	0	0
Topanga Canyon (Bottom)	*	*	*	*	0	*	*
Topanga Canyon (Lower)	0	0	0	0	0	0	0
Topanga Canyon (Upper)	0	0	0	0	0	0	32
Trancas Canyon	2	0	0	0	0	0	*
Triunfo Canyon	0	0	0	0	0	0	*
Tuna Canyon	*	0	0	1	0	0	*
Wood Canyon	0	0	0	0	0	*	*
Zuma Canyon	0	0	0	0	0	0	*

HYCA Eggs

StreamName	2000	2001	2002	2003	2004	2005	2006
Arroyo Sequit (Lower)	0	0	0	0	0	*	0
Arroyo Sequit (Upper)	1	0	0	0	0	0	*
Bell Canyon	*	*	*	*	*	*	0
Big Sycamore Canyon	0	0	0	0	0	0	0
Carlisle Canyon	0	28	0	0	0	1	0
Cheeseboro Canyon	0	0	0	0	0	*	0
Cold Creek (Lower)	0	0	0	0	0	0	*
Cold Creek (Upper)	0	0	0	0	1	*	*
Corral Canyon	0	0	0	0	0	*	*
Deer Creek	0	0	0	0	0	*	*
Erbes (Lower)	*	0	0	0	0	0	0
Erbes (Upper)	*	0	0	0	0	*	*
La Jolla Canyon	0	0	0	0	0	*	*
Lang Ranch (N)	0	0	0	0	0	0	0
Lang Ranch (S)	0	0	0	0	*	*	*
Las Virgenes (N)	0	0	0	0	0	0	0
Las Virgenes (S)	0	0	0	0	0	0	0
Liberty Canyon (S)	0	0	0	0	0	*	*
Lindero Canyon	0	0	0	0	0	*	*
Malibu Canyon (Lower)	0	*	0	0	0	*	*
Medea Creek (N)	0	0	0	0	0	0	0
Medea Creek (S)	0	0	0	0	0	0	0
Newton Canyon	0	0	0	0	0	0	*
Old Topanga Canyon	0	0	0	0	0	0	0
Palo Comado Canyon	0	0	0	0	0	*	0
Ramirez Canyon	*	0	0	67	0	0	*
Rustic Canyon	*	0	0	0	0	*	*
Serrano Canyon	0	0	1	0	0	*	*
Solstice Canyon	0	0	0	0	0	1	0
Sullivan Canyon	*	0	0	0	0	*	*
Temescal Canyon	0	*	0	0	0	0	0
Topanga Canyon (Bottom)	*	*	*	*	0	*	*
Topanga Canyon (Lower)	20	0	0	0	0	0	0
Topanga Canyon (Upper)	11	0	0	0	0	0	0
Trancas Canyon	0	0	0	0	0	17	*
Triunfo Canyon	0	0	0	0	0	0	*
Tuna Canyon	*	0	0	0	0	0	*
Wood Canyon	0	0	0	0	0	*	*
Zuma Canyon	0	0	0	0	0	0	*

HYCA Larvae

StreamName	2000	2001	2002	2003	2004	2005	2006
Arroyo Sequit (Lower)	9	0	10	0	921	*	0
Arroyo Sequit (Upper)	7	164	18	5	551	26	*
Bell Canyon	*	*	*	*	*	*	0
Big Sycamore Canyon	0	1	0	3	0	0	0
Carlisle Canyon	5	71	5	87	1152	246	208
Cheeseboro Canyon	0	0	0	0	0	*	0
Cold Creek (Lower)	0	1621	0	0	0	441	*
Cold Creek (Upper)	1	0	1	2	0	*	*
Corral Canyon	22	0	0	0	0	*	*
Deer Creek	0	0	0	0	0	*	*
Erbes (Lower)	*	0	0	0	0	0	0
Erbes (Upper)	*	0	0	0	0	*	*
La Jolla Canyon	0	0	0	0	0	*	*
Lang Ranch (N)	0	0	0	0	0	0	0
Lang Ranch (S)	0	0	0	0	*	*	*
Las Virgenes (N)	0	0	0	0	0	0	0
Las Virgenes (S)	0	0	0	0	0	0	0
Liberty Canyon (S)	0	0	0	0	0	*	*
Lindero Canyon	0	0	0	0	0	*	*
Malibu Canyon (Lower)	0	*	0	0	0	*	*
Medea Creek (N)	0	0	0	0	0	0	0
Medea Creek (S)	0	0	0	0	0	0	0
Newton Canyon	1	0	0	0	0	120	*
Old Topanga Canyon	5	0	0	0	0	0	80
Palo Comado Canyon	0	0	0	0	0	*	0
Ramirez Canyon	*	0	3	0	100	527	*
Rustic Canyon	*	0	0	1	0	*	*
Serrano Canyon	0	1	0	16	0	*	*
Solstice Canyon	2	0	1001	0	0	310	2
Sullivan Canyon	*	0	0	0	0	*	*
Temescal Canyon	0	*	0	0	0	0	0
Topanga Canyon (Bottom)	*	*	*	*	0	*	*
Topanga Canyon (Lower)	0	0	0	0	0	21	1
Topanga Canyon (Upper)	189	0	0	0	0	0	31
Trancas Canyon	59	300	11	0	355	451	*
Triunfo Canyon	0	0	0	0	0	0	*
Tuna Canyon	*	0	0	0	0	1	*
Wood Canyon	0	0	0	0	0	*	*
Zuma Canyon	31	334	0	0	98	65	*

THE DATA ARE IN THE DATABASE:

What Now?

Data in Strange Buckets

AgencyRes	Spp4Code	StreamName	SurveyDate	Population	Age	PopulationValue	PopnClass4Analysis	UpperValue	LowerValue
Pepperdine	HYRE	Arroyo Sequit (Lower)	17-May-00	5-10	Larvae	5	5-20	20	5
Pepperdine	HYRE	Arroyo Sequit (Lower)	17-May-00	5-10	Larvae	5	5-20	20	5
Pepperdine	HYRE	Arroyo Sequit (Lower)	17-May-00	<5	Larvae	1	<5	5	1
Pepperdine	HYRE	Arroyo Sequit (Lower)	17-May-00	10-20	Larvae	10	5-20	20	5
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-00	<5	Larvae	1	<5	5	1
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-00	<5	Larvae	1	<5	5	1
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-00	<5	Larvae	1	<5	5	1
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-00	<5	Larvae	1	<5	5	1
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-00	<5	Larvae	1	<5	5	1
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-00	<5	Larvae	1	<5	5	1
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-01	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-01	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-01	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-01	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-01	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-01	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-01	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-01	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-01	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	14-Jun-01	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	09-May-02	50-100	Larvae	50	21-100	100	21
Pepperdine	HYRE	Arroyo Sequit (Lower)	09-May-02	100-500	Larvae	100	101-500	500	101
Pepperdine	HYRE	Arroyo Sequit (Lower)	09-May-02	100-500	Larvae	100	101-500	500	101
Pepperdine	HYRE	Arroyo Sequit (Lower)	09-May-02	50-100	Larvae	50	21-100	100	21
Pepperdine	HYRE	Arroyo Sequit (Lower)	09-May-02	100-500	Larvae	100	101-500	500	101
Pepperdine	HYRE	Arroyo Sequit (Lower)	09-May-02	100-500	Larvae	100	101-500	500	101
Pepperdine	HYRE	Arroyo Sequit (Lower)	09-May-02	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	09-May-02	?	Larvae	0	?	0	0
Pepperdine	HYRE	Arroyo Sequit (Lower)	09-May-02	20-50	Larvae	20	21-100	100	21

① UPPER ARROYO SEQUIT (survey went downstream of culvert / tunnel bridge)

LOWER ARROYO SEQUIT 14 JUN 2000

VOK

Arroyo LOWER

34

Visual Encounter Survey for Stream Breeding Amphibians

Page #: 1

Observers: TH, RF, BN

Date: (1 / Jan. / 00) (6 / 14 / 2000) ✓

Wind: —

Cloud Cover: — %

Transect Name (#):

Length:

Precipitation: —

Coordinates:

Moon Phase:

Start Time: 9 : 54 ✓ AM PM

End Time: : AM PM

Air Temp. Start: 21 °C ✓ Mid: End:

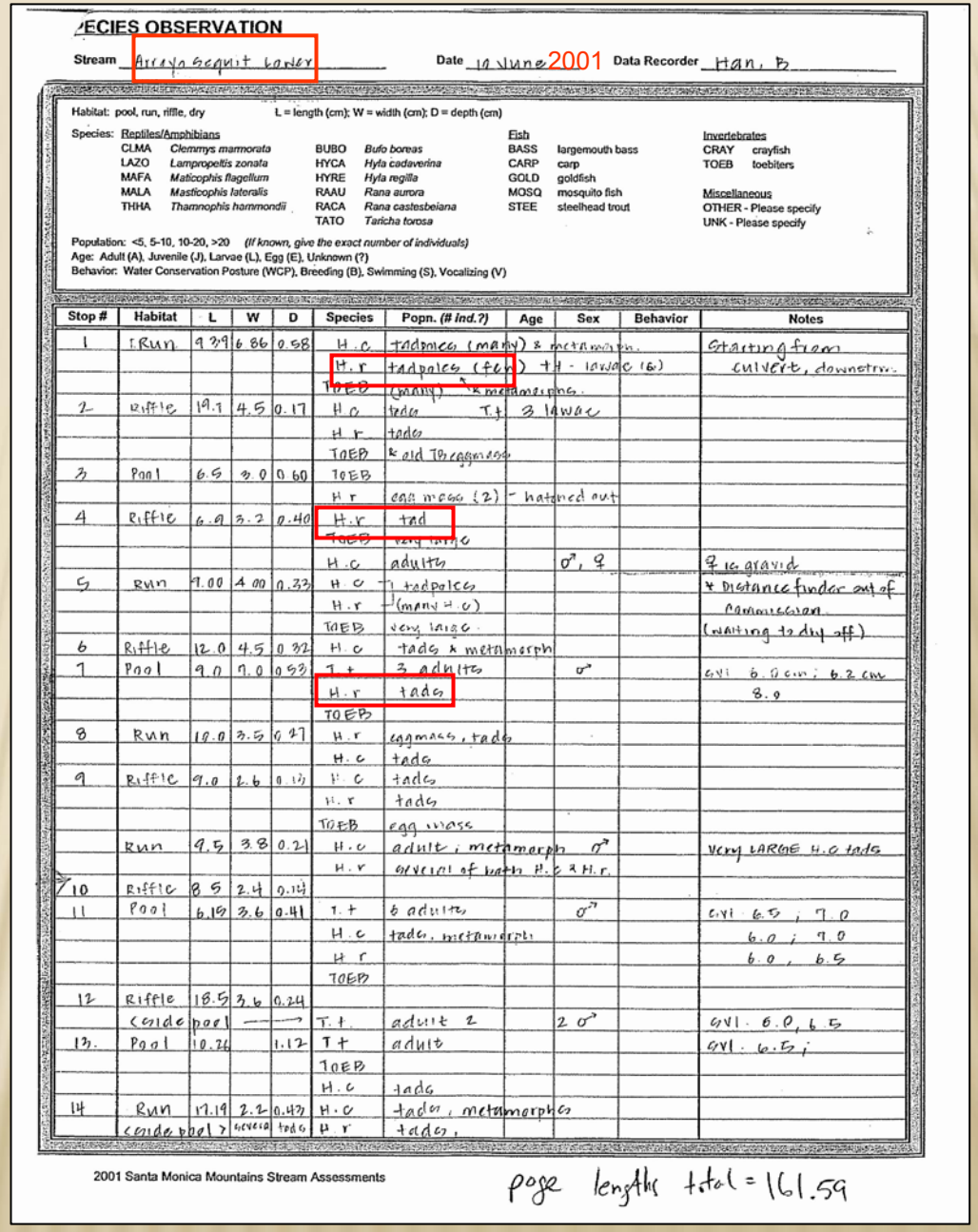
H_2O Temp. Start: 17.8 °C ✓ Mid: End:

General Weather Conditions:

	Start	Mid	End
pH	8.62 ✓		
dO (ppm)	124 ✓		
Conductivity (µS)	93 ✓		
Flow (m/s) 40 w rotary 0.13 D	1.74 ✓		
Turbidity (NTU)	30 ✓		

Run below the culvert	Habitat Desc. Type	(LxWxD)	Time	Species Code	Activity	Life Stage	Sex	SU Length	Notes:
14 – 1	✓RUN	6.57 × 4.72 × .18	:	HR tadp;					
13 – 2	✓RIFFLE	6.55 × 4.31 × 0.12	:	♀ H.C. on rock	T.T. eggmass;				
12 – 3	✓POOL	4.99 × 2.10 × 0.54	:	H.R. tadp;					
11 – 4	✓RUN	18.33 × 3.01 × 0.29	:	T.T. ♂ on rocks, HR tadp;	3 H.R. eggmasses (partial shade);			partially hatched T.T. eggmass;	
10 – 5	✓RIFFLE	6.54 × 2.96 × 0.13	:		—				
9 – 6	✓RUN	4.74 × 3.07 × 0.42	:	4 T.T. eggmass;	2 TT. eggmass (hatched) → 2 eggmasses collected				
8 – 7	✓RIFFLE	4.32 × 5.47 × 0.15	:	T.T. ♀					6.5 cm SVL
7 – 8	✓RUN	12.98 × 3.43 × 0.24	:	Juvenile T.T.	H.R. tadp,	1 T.T. eggmass;		1 hatched TT. eggmass	4.2 SVL, 1 ♀ HC
6 – 9	✓RIFFLE	5.0 × 3.45 × 0.13	:						
5 – 10	✓RUN	12.96 × 3.57 × 0.20	:	H.R. tadp;	HC tadp,				
4 – 11	✓RIFFLE	4.85 × 2.49 × 0.12	:	H.C. ♀ on rock;					
3 – 12	✓RUN	10.88 × 3.39 × 0.49	:	H.R. tadp;					
2 – 13	✓RIFFLE	15.52 × 2.69 × 0.23	:	TT ♀					6.0 SVL

Data Cover Page
Dated 14 Jun 2001



PECIES OBSERVATION

Stream: Arroyo Sequit Lower Date: 10 June 2001 Data Recorder: Han, B

Habitat: pool, run, riffle, dry L = length (cm); W = width (cm); D = depth (cm)

Species:

Reptiles/Amphibians				Fish		Invertebrates	
CLMA	*Clemmys marmorata*	BUBO	*Bufo boreas*	BASS	largemouth bass	CRAY	crayfish
LAZO	*Lampropeltis zonata*	HYCA	*Hyla cadaverina*	CARP	carp	TOEB	toebiters
MAFA	*Maticophis flagellum*	HYRE	*Hyla regilla*	GOLD	goldfish		
MALA	*Masticophis lateralis*	RAAU	*Rana aurora*	MOSQ	mosquito fish	Miscellaneous	
THHA	*Thamnophis hammondii*	RACA	*Rana castesbeiana*	STEE	steelhead trout	OTHER - Please specify	
		TATO	*Taricha torosa*			UNK - Please specify	

Population: <5, 5-10, 10-20, >20 *(If known, give the exact number of individuals)*
Age: Adult (A), Juvenile (J), Larvae (L), Egg (E), Unknown (?)
Behavior: Water Conservation Posture (WCP), Breeding (B), Swimming (S), Vocalizing (V)

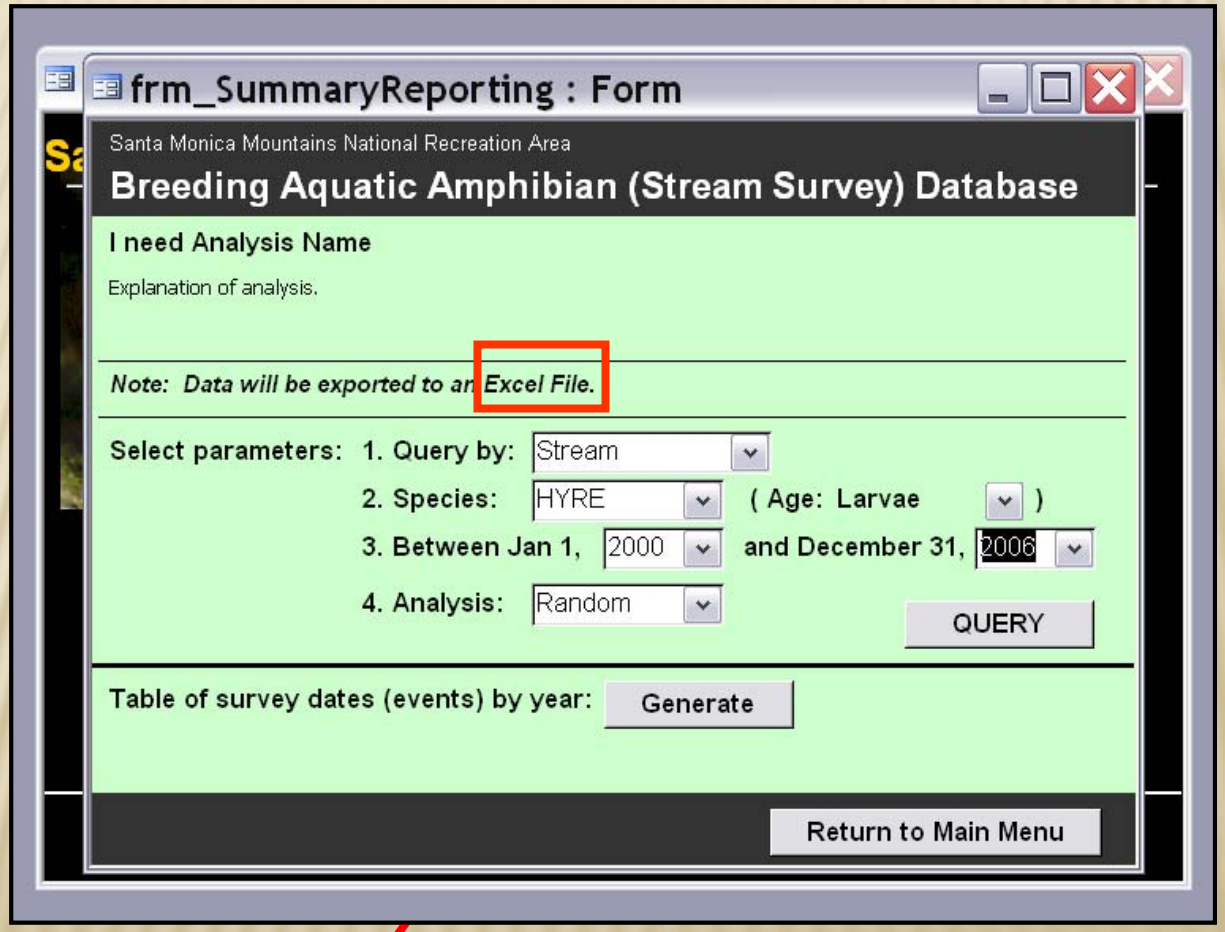
Stop #	Habitat	L	W	D	Species	Popn. (# ind.?)	Age	Sex	Behavior	Notes
1	T.Run	9.39	6.86	0.58	H.c	tadpoles (many) & metamorph.				Starting from
					H.r	tadpoles (few)				culvert, downstrm.
					TOEB	(many) & metamorphs.				
2	Riffle	19.7	4.5	0.17	H.c	tads T.t	3	lawae		
					H.r	tads				
					TOEB	& old TB eggmass				
3	Pool	6.5	3.0	0.60	TOEB					
					H.r	egg mass (2) - hatched out				
4	Riffle	6.9	3.2	0.40	H.r	tad				
					TOEB	very large				
					H.c	adults		♂, ♀		♀ is gravid
5	Run	9.00	4.00	0.33	H.c	tadpoles				* Distance finder out of
					H.r	(many H.c)				commission.
					TOEB	very large.				(waiting to dry off)
6	Riffle	12.0	4.5	0.32	H.c	tads & metamorph				
7	Pool	9.0	7.0	0.53	T.t	3 adults		♂		SVL 6.0 cm; 6.2 cm
					H.r	tads				8.0
					TOEB					
8	Run	10.0	3.5	0.27	H.r	eggmass, tads				
					H.c	tads				
9	Riffle	9.0	2.6	0.13	H.c	tads				
					H.r	tads				
					TOEB	egg mass				
	Run	9.5	3.8	0.21	H.c	adult; metamorph		♂		Very LARGE H.c tads
					H.r	several of both H.c & H.r.				
10	Riffle	8.5	2.4	0.14						
11	Pool	6.15	3.6	0.41	T.t	6 adults		♂		SVL 6.5; 7.0
					H.c	tads, metamorph				6.0; 7.0
					H.r					6.0, 6.5
					TOEB					
12	Riffle	18.5	3.6	0.24						
	(side	pool	→		T.t	adult 2		2 ♂		SVL 6.0, 6.5
13.	Pool	10.26		1.12	T.t	adult				SVL 6.5;
					TOEB					
					H.c	tads				
14	Run	17.19	2.2	0.43	H.c	tads, metamorphs				
	(side pool)		several	tads	H.r	tads,				

2001 Santa Monica Mountains Stream Assessments

page lengths total = 161.59

PopulationClass	PopulationValue	PopnClass4Analysis	UpperValue	LowerValue
>20	20	5-20	20	5
5-20	5	5-20	20	5
5-10	5	5-20	20	5
10-20	10	5-20	20	5
?	0	?	0	0
<5	1	<5	5	1
>500	500	>500	500	0
500-1000	500	>500	1000	500
>1000	1000	>500	1000	500
101-500	101	101-500	500	101
>100	100	101-500	500	101
100-500	100	101-500	500	101
20-30	20	21-100	100	21
21-100	21	21-100	100	21
21-50	21	21-100	100	21
20-50	20	21-100	100	21
50-100	50	21-100	100	21
NA	0	NA	0	0

DATA MANAGER WRITES A NIFTY ROUTINE TO EXTRACT THE DATA:

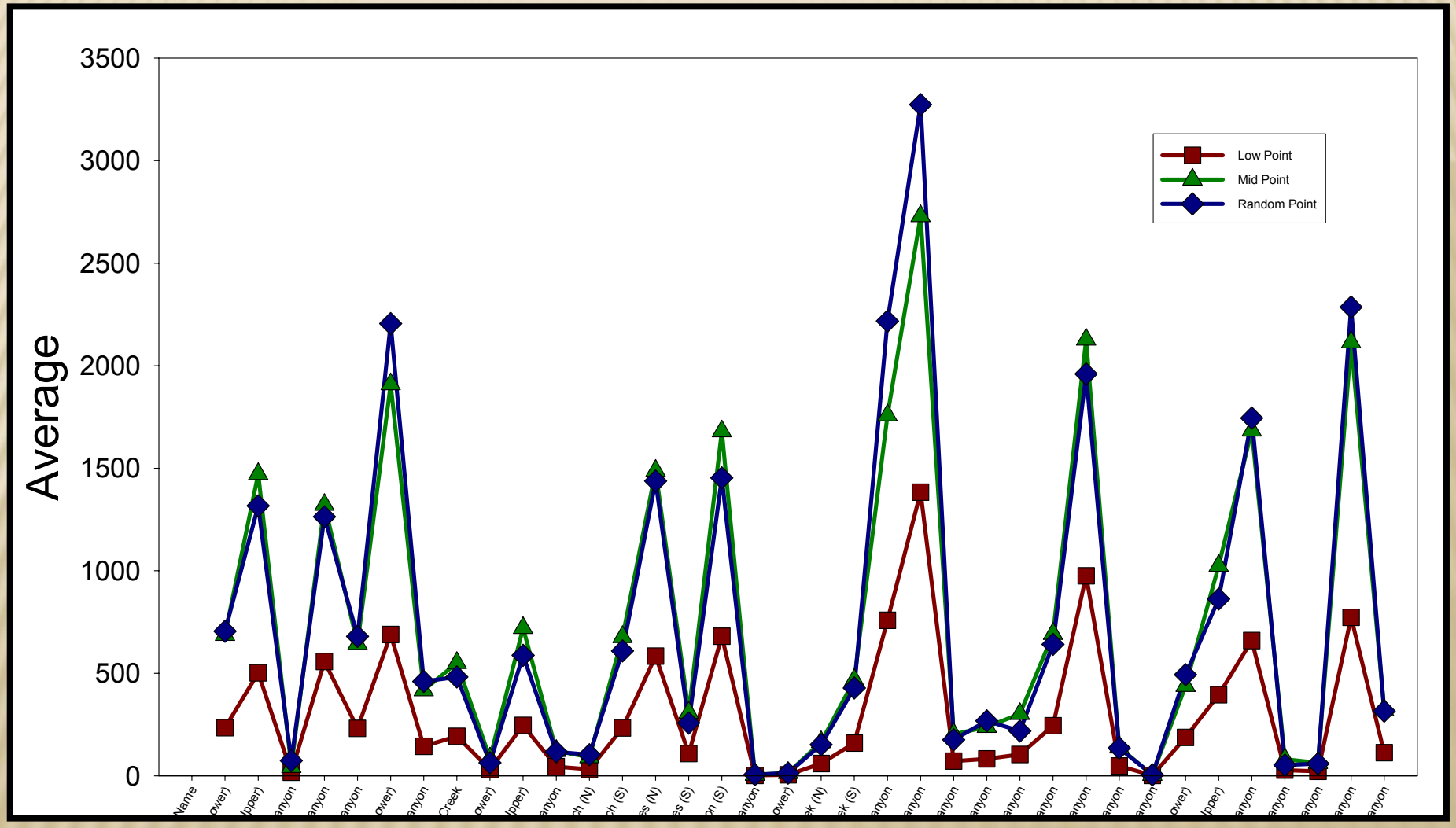


WHAT VALUE(S) SHOULD WE ANALYZE?

- Exact Count?
- Low Point of Bucket?
- Mid Point of Bucket?
- Random Point selected from range of bucket?

At issue is effect on Variance in data!

Precision & Bias!


Average
3500
3000
2500
2000
1500
1000
500
0
Low Point
Mid Point
Random Point

ERROR IN HYPOTHESIS TESTING

Decision	Null Hypothesis	
	True	**False**
Fail to reject H_o	Correct Decision: $p = 1 - \alpha$	Type II error: $p = \beta$
Reject H_o	Type 1 error: $p = \alpha$	Correct Decision: $p = 1 - \beta$

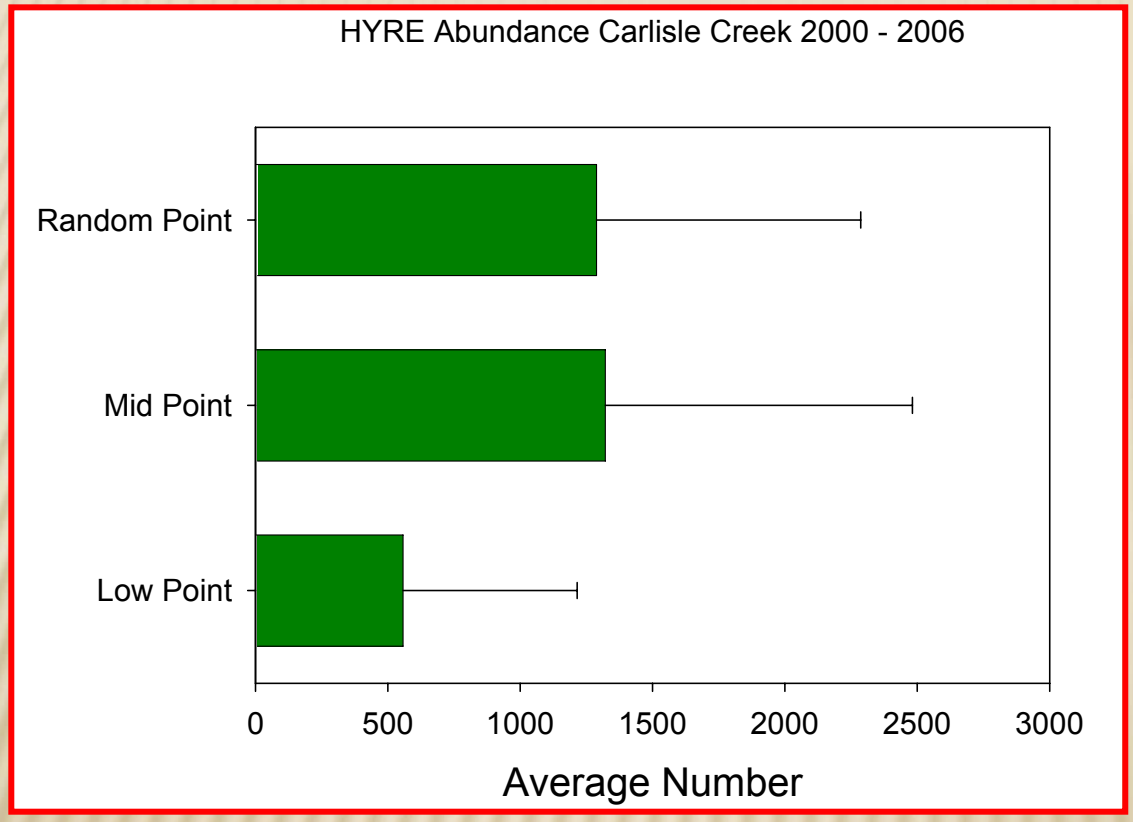
Power ($1 - \beta$) is a measure of the confidence we have in rejecting the null hypothesis when it is false.

- α, the probability of a type I error (level of significance). As the probability of a Type I error (α) increases, the probability of a Type II error (β) decreases. Since power = $1 - \beta$, as α increases, power also increases.
- σ, the variability in the population. As σ increases, power decreases.
- The size of the population difference (effect size). As the size of the difference (effect size) decreases, power decreases.
- Sample size. As sample size increases, power increases.

Effect of SD and Sample Size on Power

		Difference			Power (Diff = 25)			
n	Power	SD = 19.7	SD = 39.8	SD = 56.2	n	SD = 19.7	SD = 39.8	SD = 56.2
5	0.2	15.7300	31.7632	44.852	5	0.422927	0.141959	0.095460
5	0.4	24.1566	48.7789	68.879	7	0.587468	0.191369	0.119694
5	0.6	31.4211	63.4481	89.593	9	0.714530	0.240543	0.144056
5	0.8	39.9017	80.5727	113.773	11	0.807660	0.289080	0.168532

HYRE ABUNDANCE CARLISLE CREEK 2000 - 2006



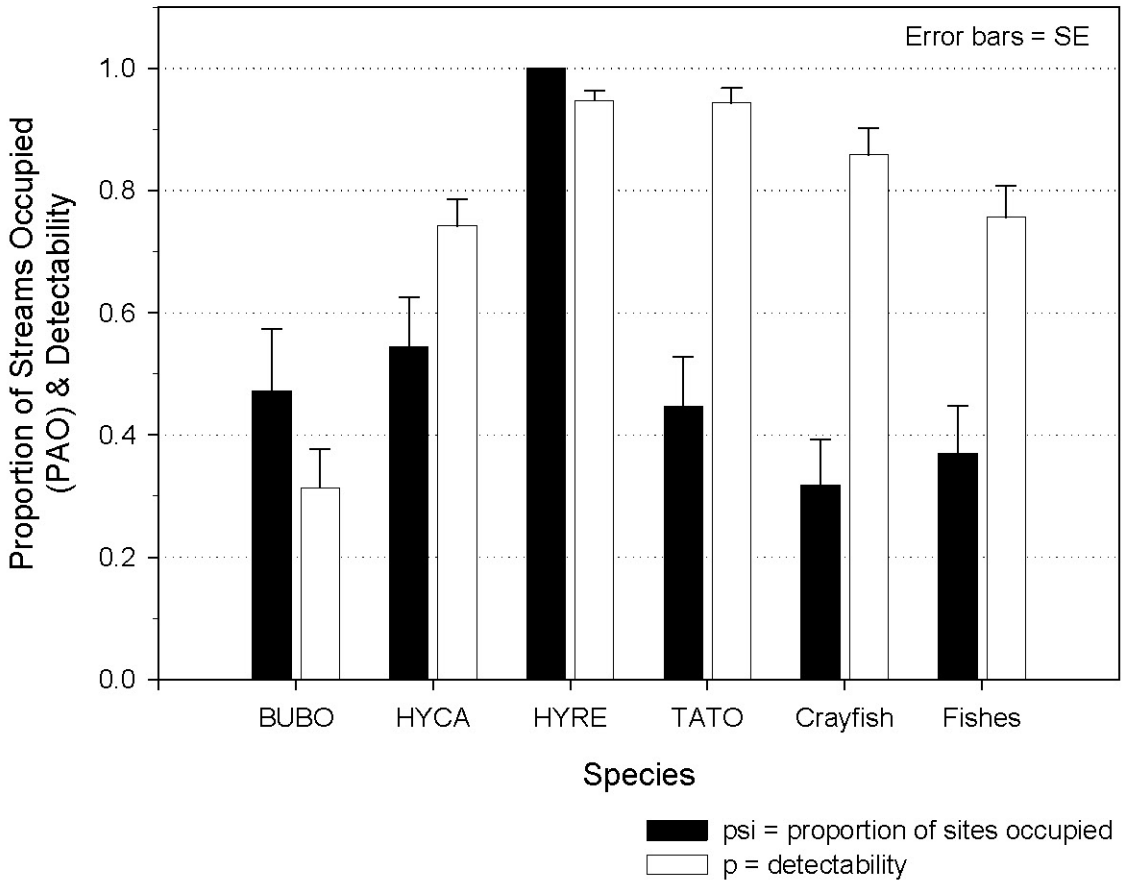
Sample Size	Power
7	0.3923
9	0.4788
11	0.5572
13	0.6270
15	0.6883
17	0.7412
19	0.7866

One-way Analysis of Variance (Carlisle)

Source	DF	SS	MS	*F*	*P*
Range	2	2610875	1305438	1.43	0.265
Error	18	16403233	911291		
Total	20	19014108			

BOTTOM LINE?

- Mid-point average not too different from random point average.
- Random point variance a little larger than mid-point variance.
- Whatever makes you feel warm and fuzzy!
- I Like Random Point.


Error bars = SE
Proportion of Streams Occupied (PAO) & Detectability
1.0
0.8
0.6
0.4
0.2
0.0
BUBO
HYCA
HYRE
TATO
Crayfish
Fishes
Species
psi = proportion of sites occupied
p = detectability