

**Santa Cruz Long-Toed Salamander Field Studies  
 1998-2009**



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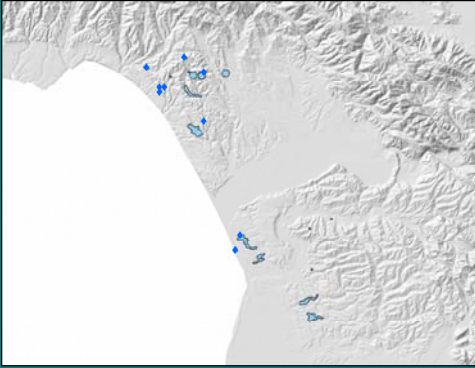
**Santa Cruz Long-Toed Salamander Field Studies  
 1998-2009 Outline**

- I) Seascapes Uplands Preserve
  - a. History
  - b. Monitoring Program
  - c. Seascapes Uplands Pond 1
  - d. Bonita Pond (Pond 3)
  - e. Uplands Pond 2
- II) Studies at Other Breeding Sites
  - a. Valencia Lagoon
  - b. Buena Vista Pond
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  - d. Tucker Pond
  - e. McClusky Slough
  - f. Zmudowski Pond
- III) Upland Trapping
  - a. Seascapes Uplands
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- IV) Management and Monitoring Implications

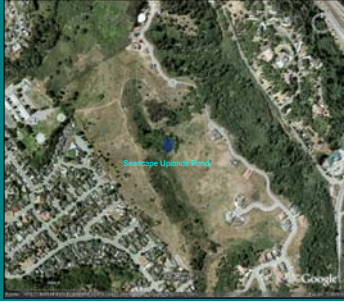
**Santa Cruz Long-Toed Salamander**



**Santa Cruz Long-Toed Salamander Range**



**Seascapes Uplands Pond**

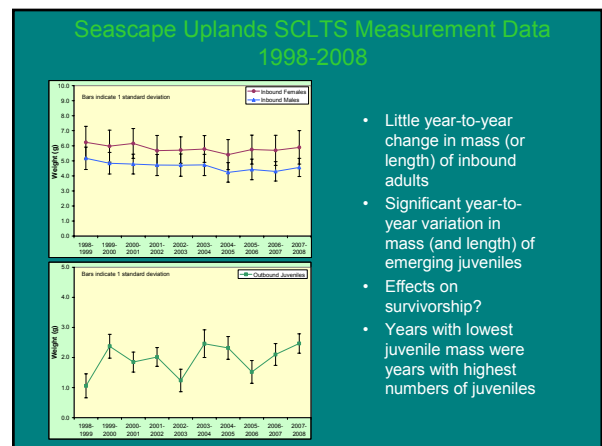
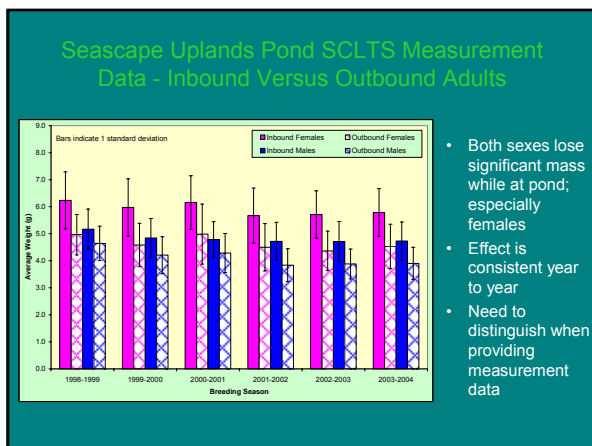
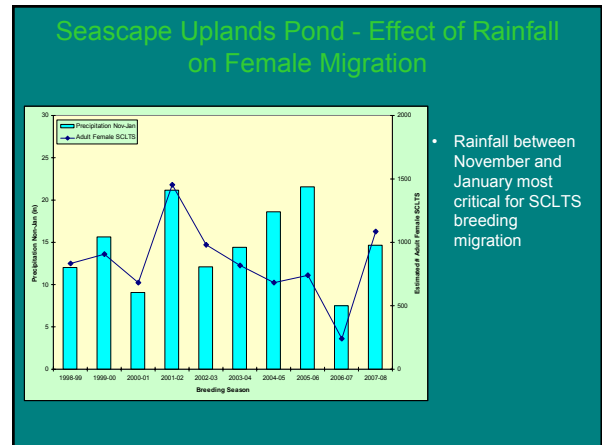
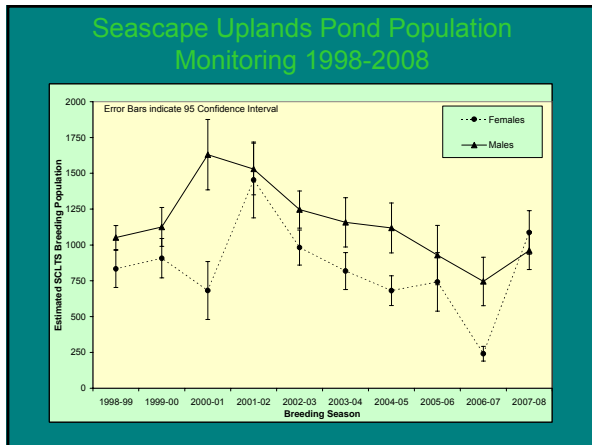
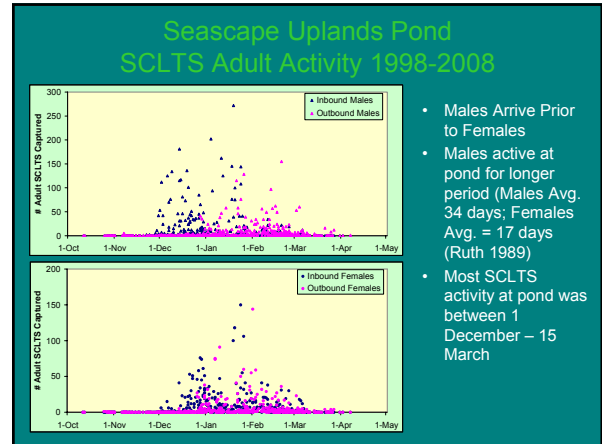
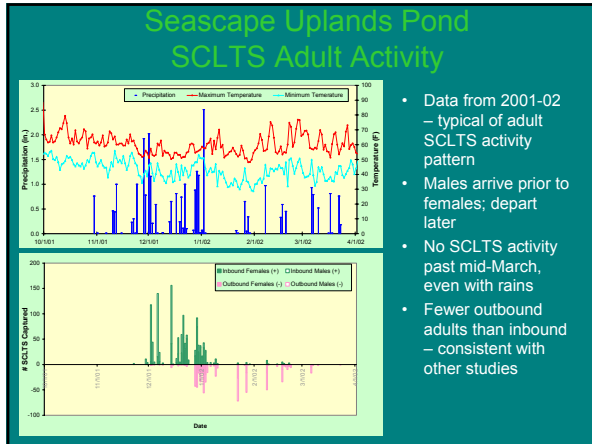


- SCLTS discovered in 1974 in permanent stock pond; catfish & bullfrogs present
- Berm breached in 1975-76, creating seasonal pond
- Ruth Study 1986-87; Adult population estimate = 1,468 ± 60
- HCP Approved; CNLM takes title in 1998
- Two mitigation ponds; road tunnels built in 1999
- Long-Term SCLTS Monitoring 1998-Present

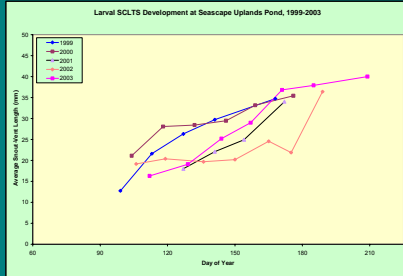
**Seascapes Uplands SCLTS Long-Term Monitoring**

- **Study Design Considerations**
  - Track Adult Population Trends
  - Measure Larval Growth & Abundance
  - Minimize impacts of study on SCLTS & other species
  - Minimize Cost
- **Drift-Fence/Pitfall Trapping**
  - Regularly spaced fencing around pond (~75% enclosure)
  - Traps open only during rains & 1 night following
  - Traps opened 1<sup>st</sup> Fall rains through April
  - Pond 1 monitored 1998-2008; Pond 3 monitored 2002-2008
- **Aquatic Sampling**
  - Sample every 2 weeks between mid-April and July
  - Measure 25 larvae on each occasion
  - Quantify larvae on 100 ft<sup>2</sup> plots
  - Level of effort reduced after 6 years to presence/absence

Elkhorn Slough Coastal Training Program  
 Santa Cruz Long-Toed Salamander  
 Workshop 2009

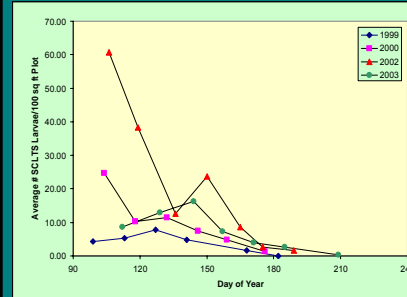


### SCLTS Larval Monitoring Seascapes Uplands Pond



- Larvae transform at 35-40 mm SVL
- Larvae can persist through July if water available; but usually transform by end of June

### SCLTS Larval Monitoring Seascapes Uplands Pond



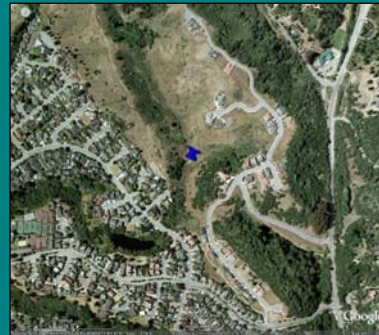
- Larval density greatest in April & May
- Vegetation changes on plots problematic
- Strong correlation between maximum larval abundance and # juveniles following season
- Limited value in comparing site to site

### Bonita Pond (Uplands Pond 3)



- Constructed 1999
- Designed to be ephemeral; holds water year-round
- Colonized by SCLTS 2000
- Estimated population increased steadily from 311 ± 50 in 2002-03 to 1,242 ± 186 in 2007-08
- Adjacent high-quality over-summering habitat
- Bonita Road source of mortality

### Uplands Pond 2



- Built 1999
- Designed to be seasonal; holds water year-round
- SCLTS first bred in 2002
- Population estimate in 2007-08 was 351 ± 124
- Relatively low larval abundance – some unhealthy

### Valencia Lagoon



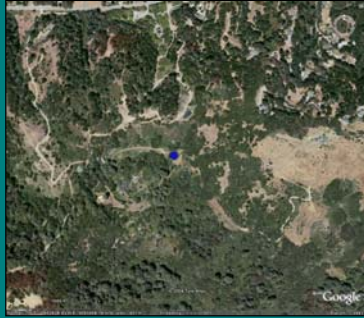
- Type locality for subspecies (1954)
- Population estimate in 1977-78 (Reed 1979) was 2,583 ± 120
- Population estimate in 2007-08 (Biosearch 2008) was 734 ± 149
- SCLTS breeding in both mitigation pond and drainage channel
- Highway 1 barrier to movements; Bonita Road source of mortality

### Millsap Pond



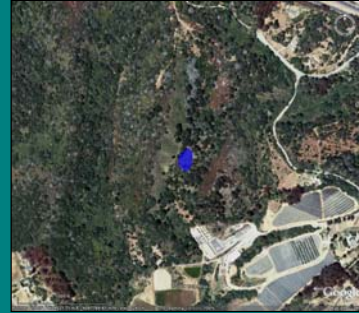
- In Calabasas Complex
- Population Estimate 2000-2001 = 197 ± 16
- Suitable Uplands in Vicinity
- Pond size is limiting factor
- California red-legged frog also present

### Tucker Pond



- In Calabasas Complex
- Population Estimate (Bland 2001) 1,062 ± 38
- HCP approved 2007
- Conservation Easement granted to CNLM
- Population estimate to be conducted Years 1, 5 and 10
- No SCLTS larvae present in 2007 (goldfish) or 2008 (?)
- Bullfrogs & rough-skinned newts present

### Buena Vista Pond



- In Ellicott-Buena Vista Complex
- California tiger salamander also present
- 2008-09 SCLTS Breeding Adult Population Estimate was 775 ± 380
- Below-average rainfall in December and January; pond did not hold water until late February

### McClusky Slough



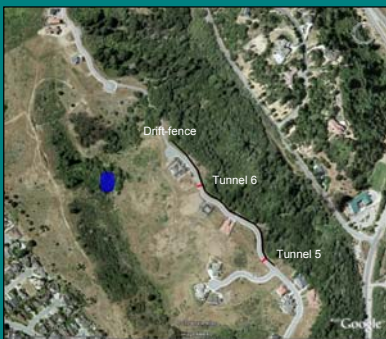
- Only southern perimeter of slough trapped –not comparable to other sites.
- 2001-2002: 33 adult & 53 juvenile SCLTS trapped; few recaptures
- Adults significantly smaller than other populations
- Upland habitat is limiting factor
- California red-legged frog also present

### Zmudowski Pond



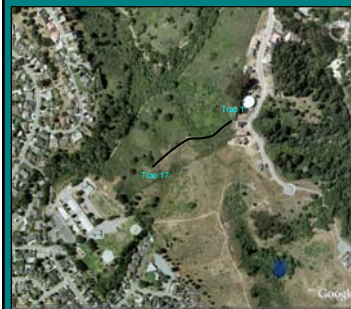
- 2001-2002: 10 adult & 6 juvenile SCLTS trapped; no recaptures
- Most trapped in southeast corner near only available willow habitat
- Adults significantly smaller than other populations
- Upland habitat is limiting factor
- Salinity 0.5 ppt

### Upland Trapping - Seascape Uplands



- New road built across known migratory route – source of take
- 6 tunnels built - untested for SCLTS
- Migrating SCLTS marked along fence in 2000-01
- Only 4 of 44 (9%) marked adults passed through tunnels
- Need to test again to see if population has adapted

### Upland Trapping - Willow Canyon



- Drift-fence ¼ mile from Seascape Uplands Pond
- Willow Canyon Upland Fence 2001-2002 Estimated Adult Population = 886 ± 51
- Seascape Uplands Pond 2001-2002 Estimated Adult Population = 2,927 ± 289
- ~ 26- 36 % of Seascape Uplands Pond Adults Migrated from/to Willow Canyon in 2001-2002

# Elkhorn Slough Coastal Training Program Santa Cruz Long-Toed Salamander Workshop 2009



### Santa Cruz Long-Toed Salamander Population Studies - Laabs & Allaback 1998-2009 Summary

Breeding Complex	Breeding Season	Trap Period	# Nights	# Traps	Peak Arrival Male	Peak Arrival Female	Est. # Adults	95% CI	Sex Ratio M:F	% Deformed
<b>Valencia-Seascape Complex</b>										
Valencia Lagoon	2007-08	10 Oct - 15 Apr	55	198	4-Jan	26-Jan	734	149	0.67	1.8
Seascape Uplands Pond	1998-99	15 Oct - 30 Mar	49	32	18-Jan	20-Jan	1833	131	1.26	
Seascape Uplands Pond	1999-00	15 Oct - 15 Mar	58	32	18-Jan	24-Jan	2041	193	1.24	0.7
Seascape Uplands Pond	2000-01	30 Sep - 30 Apr	51	32	11-Jan	24-Jan	2310	510	2.39	0.1
Seascape Uplands Pond	2001-02	25 Sept - 30 Mar	69	32	6-Dec	29-Dec	2927	289	1.05	
Seascape Uplands Pond	2002-03	15 Oct - 2 Apr	51	40	14-Dec	28-Dec	2234	178	1.27	0.7
Seascape Uplands Pond	2003-04	30 Nov - 30 Mar	50	40	20-Dec	30-Dec	1983	214	1.42	0.7
Seascape Uplands Pond	2004-05	1 Dec - 15 Mar	35	40	9-Dec	31-Dec	1794	195	1.64	0.1
Seascape Uplands Pond	2005-06	1 Dec - 15 Mar	41	40	19-Dec	23-Dec	1683	290	1.25	0.1
Seascape Uplands Pond	2006-07	27 Nov - 30 Mar	34	40	13-Dec	11-Feb	690	152	2.09	0.7
Seascape Uplands Pond	2007-08	1 Dec - 15 Mar	41	40	4-Jan	26-Jan	2074	204	0.88	0.3
Bonita Pond	2002-03	15 Oct - 2 Apr	51	48	14-Dec	10-Jan	311	50	1.03	
Bonita Pond	2003-04	30 Nov - 30 Mar	50	48	20-Dec	30-Dec	399	76	1.64	0.8
Bonita Pond	2004-05	1 Dec - 15 Mar	35	48	9-Dec	1-Jan	597	105	1.54	0.6
Bonita Pond	2005-06	1 Dec - 15 Mar	41	48	19-Dec	23-Dec	686	122	1.83	0.0
Bonita Pond	2006-07	27 Nov - 30 Mar	34	48	13-Dec	27-Dec	674	135	1.45	0.3
Bonita Pond	2007-08	1 Dec - 15 Mar	41	48	4-Jan	4-Jan	1242	186	1.09	0.2
Uplands Pond 2	2007-08	1 Dec - 15 Mar	41	30	4-Jan	26-Jan	351	124	1.60	0.0
Willow Canyon <sup>a</sup>	2001-02	20 Nov - 31 Mar	61	34	2-Dec	2-Dec	886	51	0.87	
<b>Calabassas Complex</b>										
Milzap Pond	2000-01	14 Nov - 7 Apr	40	32	11-Jan	11-Feb	98	16	1.65	1.2
<b>Ellicott-Buena Vista Complex</b>										
Buena Vista Pond	2008-09	15 Oct - 15 Mar	60	60	22-Jan	16-Feb	775	380	0.85	2.0
<b>McCluskey Slough Complex</b>										
McCluskey Slough <sup>b</sup>	2001-02	15 Oct - 1 Apr	54	50	na	na	32 <sup>c</sup>	na	1.00	2.3
Zimudowski Pond	2001-02	15 Oct - 1 Apr	54	60	na	na	10 <sup>d</sup>	na	0.67	2.3

<sup>a</sup> Traps in upland 14 mile from Seascape Pond  
<sup>b</sup> Only small percentage of pond perimeter sampled; not comparable to other studies  
<sup>c</sup> Insufficient recaptures to allow for population estimate

### Santa Cruz Long-Toed Salamander Field Studies 1998-2009

Management and Monitoring Implications

1. Both aquatic and upland habitats need protection
2. Variety of upland habitats used; large-scale movements across grassland & scrub habitats
3. Variety of aquatic habitats used; Permanent ponds used but potential for introduced predators & other factors
4. Natural variability in population size - Seascape Uplands Pond SCLTS population ranged between ~1,000 and ~3,000 breeding adults over 10-year period
5. Rainfall total important, but timing equally important; November to January critical
6. Pitfall trapping studies should extend from 1 December to 15 March
7. Any quantitative larval sampling effort affected by vegetation - between-site comparisons difficult