



SMALL ANIMAL USE OF WILDLIFE UNDERPASSES

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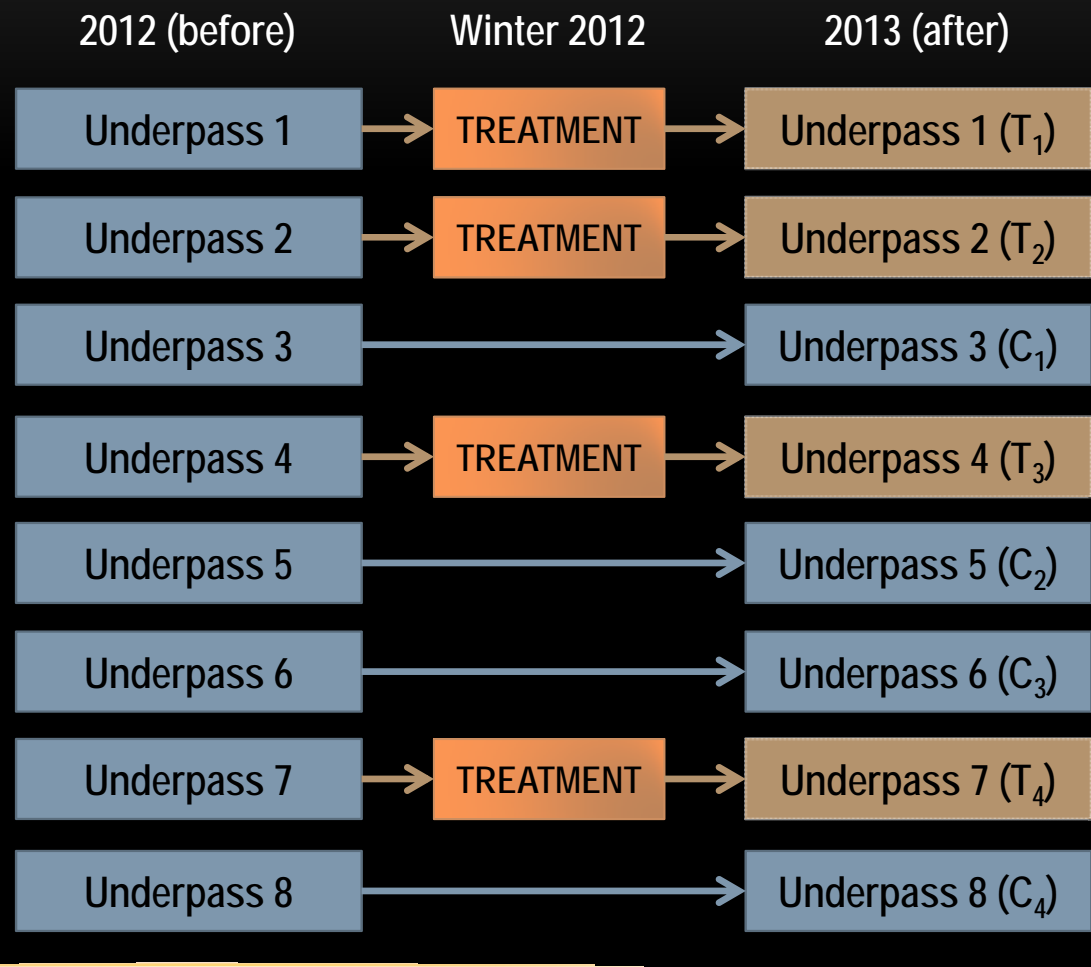
SMALL ANIMALS AND CONNECTIVITY



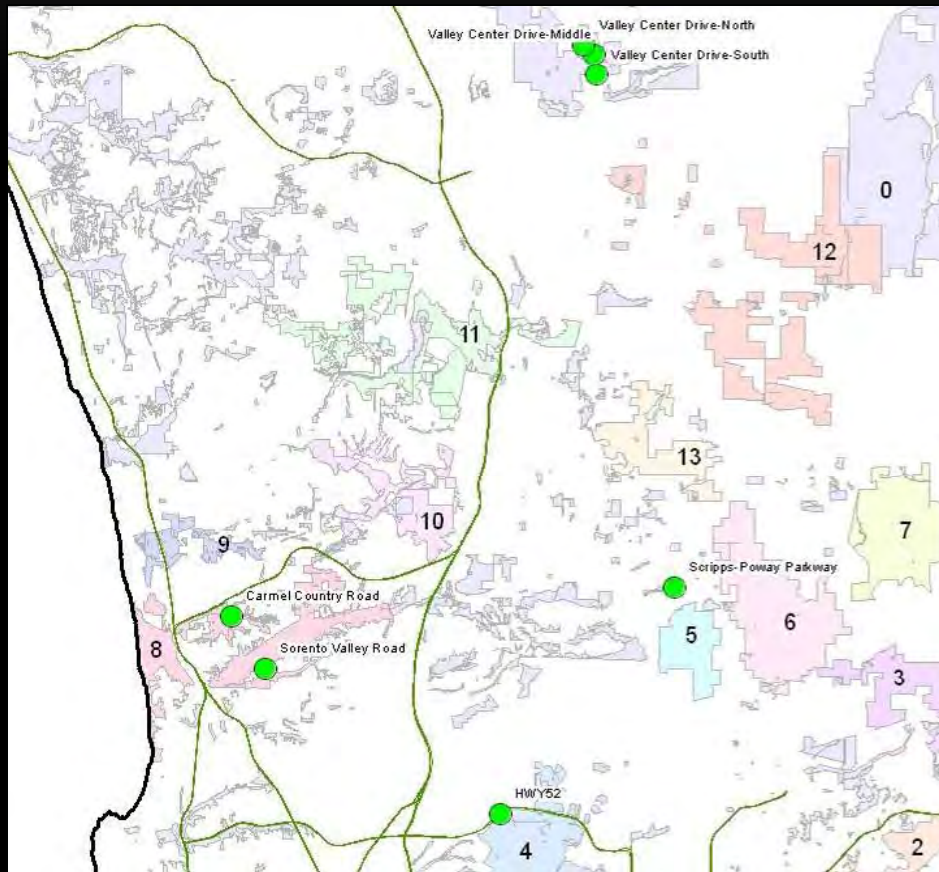
OBJECTIVES AND APPROACH

Questions:

- Is large animal use a good indicator or small animal use?
- Which small animal species, of those in the surrounding area, use the underpasses?
- Does adding structure inside underpasses enhance small animal use?



STUDY SITES



- 8 tunnels with cameras
 - SR-52 at Mission Trails (1)
 - Sorento Valley (1)
 - Carmel Country Road (2)
 - Scripps-Poway Parkway (1)
 - Valley Center Road (3)
- Tunnels
 - No roads
 - No riparian (water)

VALLEY CENTER ROAD



SCRIPPS POWAY PARKWAY



HIGHWAY 52



CARMEL COUNTRY ROAD



SORRENTO VALLEY ROAD (LOPEZ CANYON)

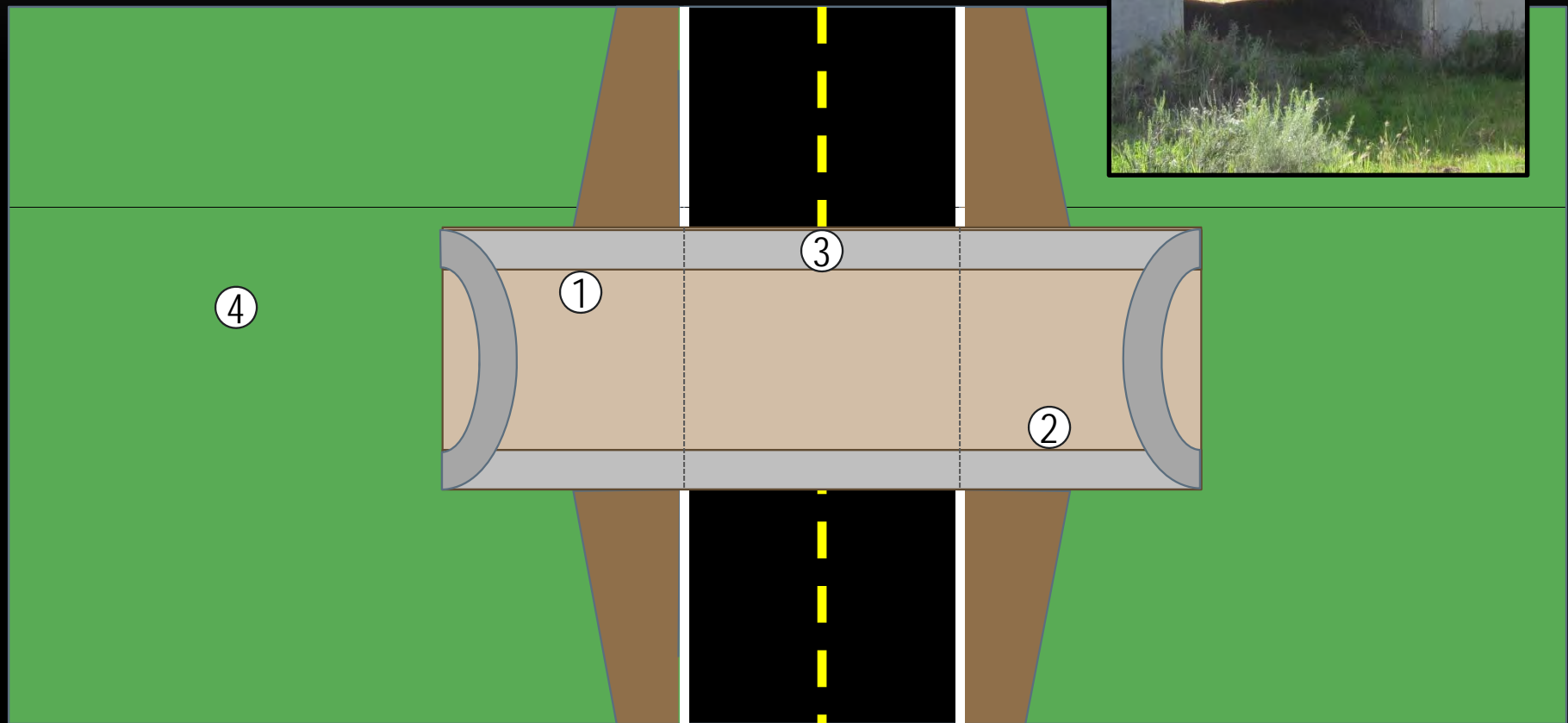


CAMERAS

- Reconyx PC800 HyperFire
 - IR flash
- Manufacturer
 - Increased sensitivity
 - Decreased focal length
- Placed close to the ground
 - Approx. 2 inches
- Trigger Mechanisms:
 - Motion Detection
 - Time Lapse



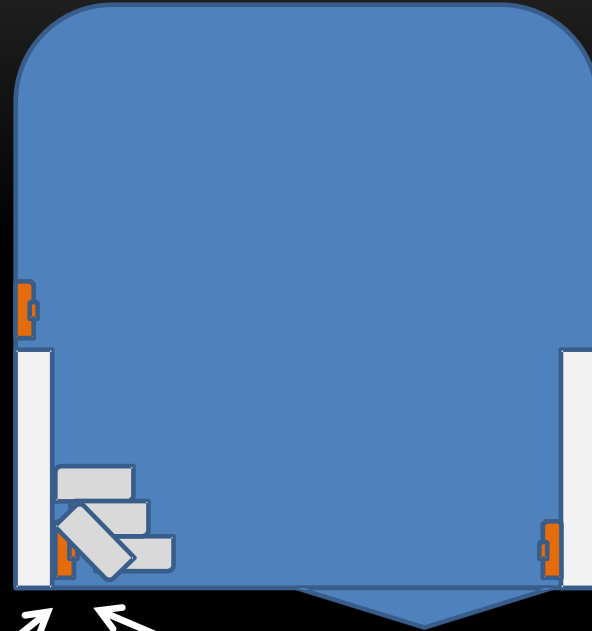
CAMERA PLACEMENT



CAMERA INSTALLATION



TREATMENT

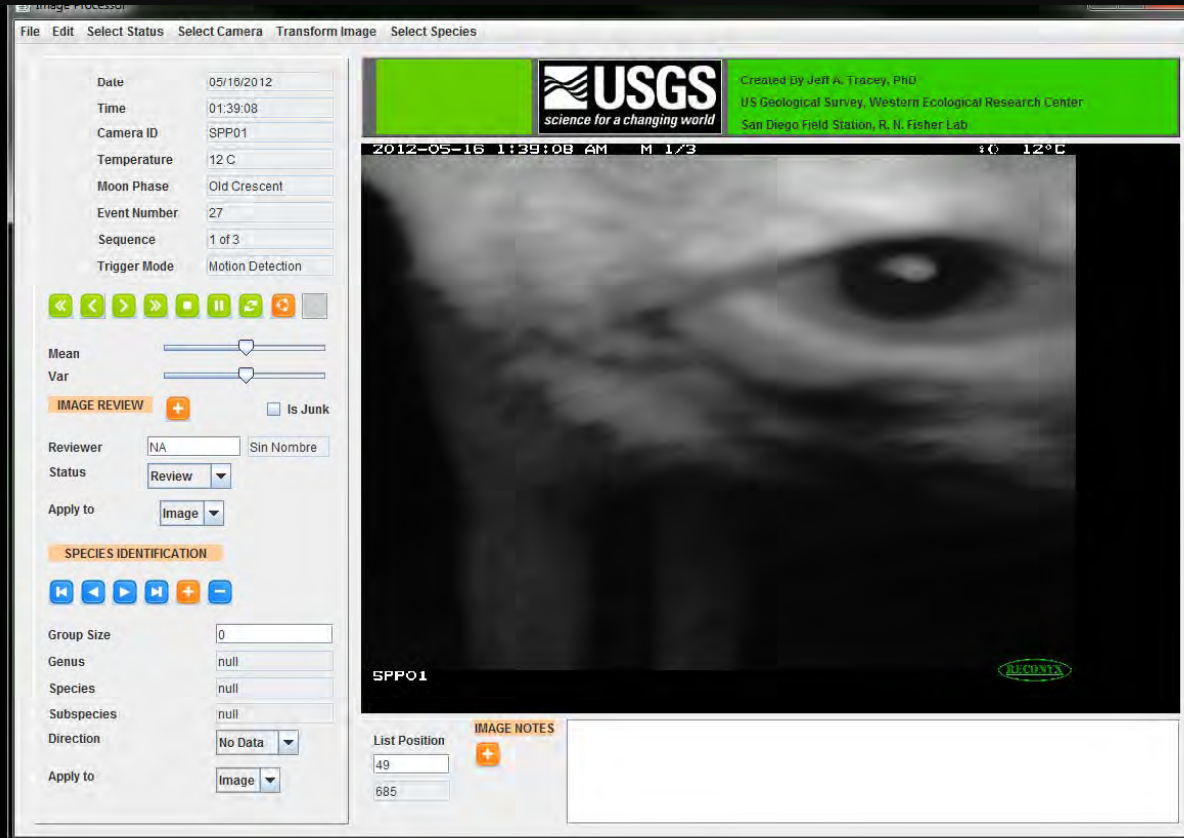


PROGRESS SO FAR

- Installation:
 - Interior cameras: 5/15 – 7/2
 - Exterior cameras: 5/16 – 8/15
 - 26 cameras currently deployed
- Challenges with external cameras
- Total: 998,419 images, 350.9 GB (as of 9/20/12)
- At SPP: 96,693 images 34.9 GB (as of 9/20/12);
 - > 11,000 motion detection images with animals (incl. humans)
 - About 10% are motion detection



IMAGE PROCESSING



“Scanimals” Logo Ideas?

- Java Program (in β testing; that is, *not ready for release*)

WHAT THE IMAGE PROCESSING PROGRAM DOES

- Preprocess Images
 - Extract metadata
 - Copy image to working folder with unique name
 - Add entry in data structure
- Select Subsets of the Images
- View, navigate, animate, transform images
- Assign an evaluation status to images
- Assign species identification to images from pull-down menu
 - Menu created from CSV file of species data
 - Carlton made our list
- Export data to CSV files
 - Later to Access and/or MySQL?

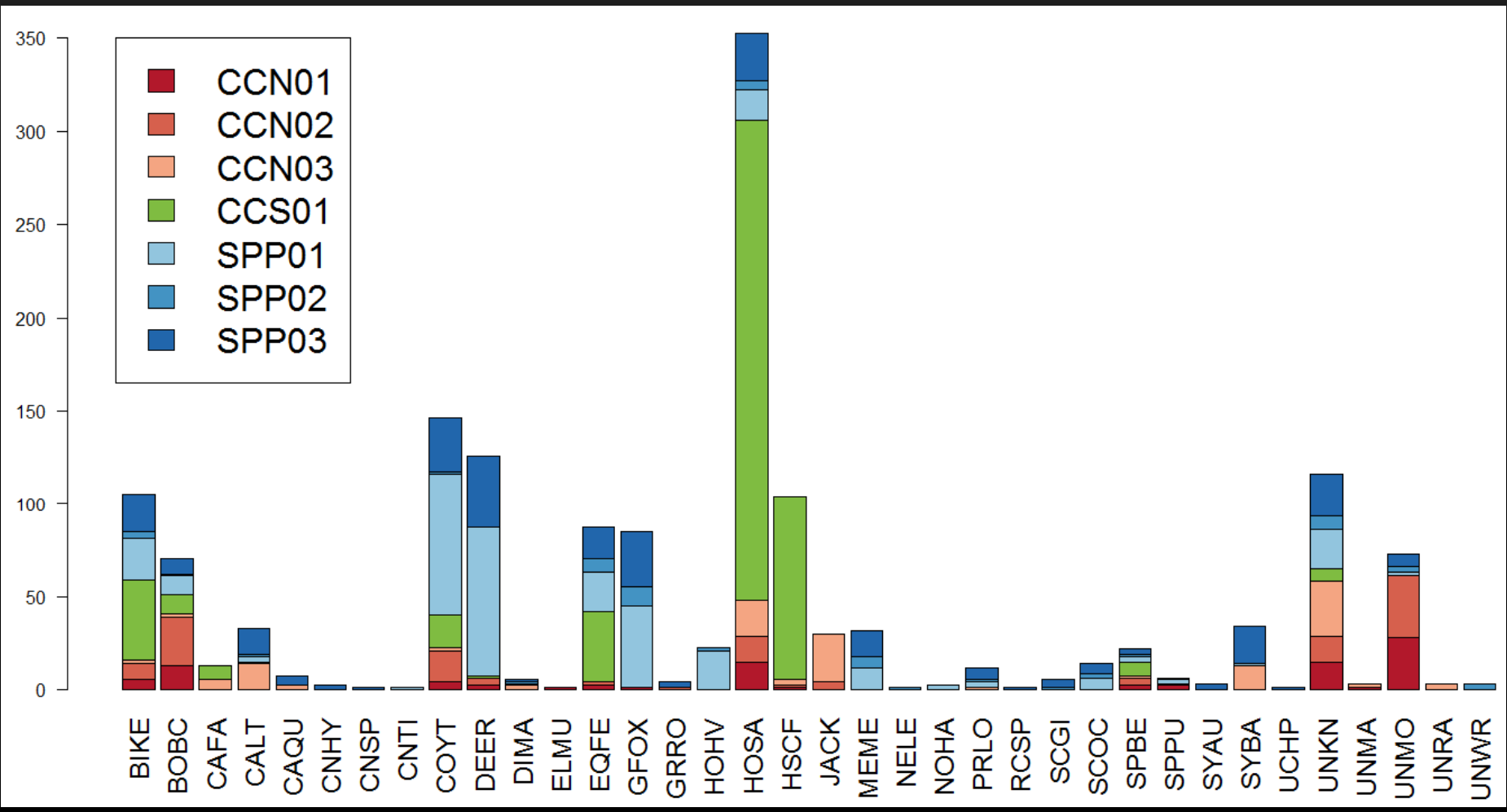
DATA EXPORT

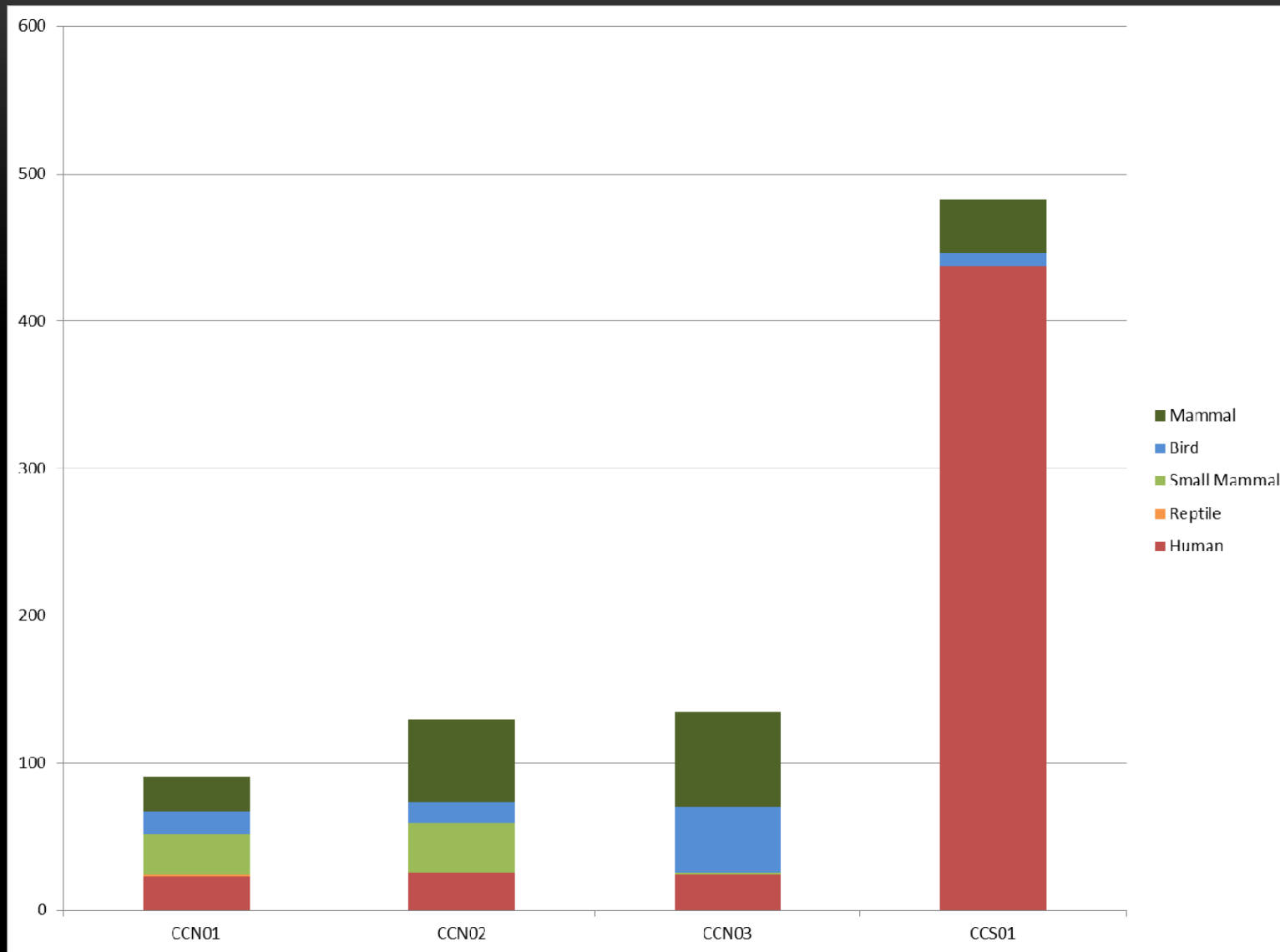
ImageDataExport-Excel-20sep2012 - Microsoft Excel

imageID	file	siteID	cameraID	date	time	trigger	temperature	moonPhase	imageGroupID	numberAnimals	genus	species	subspecies	speciesCode	travelDirection
9130	CCN01-20120608-171505-event0032-1of3	CCN	CCN01	06/08/2012	17:15:05	Motion Detection	18 C	Waning Gibbous	10	1	Homo sapiens	NA	HOSA	Toward	
9131	CCN01-20120608-171506-event0032-2of3	CCN	CCN01	06/08/2012	17:15:06	Motion Detection	18 C	Waning Gibbous	10	1	Homo sapiens	NA	HOSA	Toward	
9132	CCN01-20120608-171507-event0032-3of3	CCN	CCN01	06/08/2012	17:15:07	Motion Detection	18 C	Waning Gibbous	10	1	Homo sapiens	NA	HOSA	Toward	
9238	CCN01-20120609-020235-event0033-1of3	CCN	CCN01	06/09/2012	02:02:35	Motion Detection	11 C	Waning Gibbous	2	1	Lynx rufus	NA	BOBC	Away	
9239	CCN01-20120609-020236-event0033-2of3	CCN	CCN01	06/09/2012	02:02:36	Motion Detection	11 C	Waning Gibbous	2	1	Lynx rufus	NA	BOBC	Away	
9240	CCN01-20120609-020237-event0033-3of3	CCN	CCN01	06/09/2012	02:02:37	Motion Detection	11 C	Waning Gibbous	2	1	Lynx rufus	NA	BOBC	Away	
9475	CCN01-20120609-213204-event0034-1of3	CCN	CCN01	06/09/2012	21:32:04	Motion Detection	15 C	Waning Gibbous	13	1	Lynx rufus	NA	BOBC	Toward	
9476	CCN01-20120609-213205-event0034-2of3	CCN	CCN01	06/09/2012	21:32:05	Motion Detection	15 C	Waning Gibbous	13	1	Lynx rufus	NA	BOBC	Toward	
9477	CCN01-20120609-213206-event0034-3of3	CCN	CCN01	06/09/2012	21:32:06	Motion Detection	15 C	Waning Gibbous	13	1	Lynx rufus	NA	BOBC	Toward	
9478	CCN01-20120609-213209-event0035-1of3	CCN	CCN01	06/09/2012	21:32:09	Motion Detection	15 C	Waning Gibbous	13	1	Lynx rufus	NA	BOBC	Toward	
9479	CCN01-20120609-213211-event0035-2of3	CCN	CCN01	06/09/2012	21:32:11	Motion Detection	15 C	Waning Gibbous	13	1	Lynx rufus	NA	BOBC	Toward	
9480	CCN01-20120609-213212-event0035-3of3	CCN	CCN01	06/09/2012	21:32:12	Motion Detection	15 C	Waning Gibbous	13	1	Lynx rufus	NA	BOBC	Toward	
9644	CCN01-20120610-105148-event0037-1of3	CCN	CCN01	06/10/2012	10:51:48	Motion Detection	17 C	Last Quarter	11	1	Homo sapiens	NA	HOSA	Toward	
9645	CCN01-20120610-105149-event0037-2of3	CCN	CCN01	06/10/2012	10:51:49	Motion Detection	17 C	Last Quarter	11	1	Homo sapiens	NA	HOSA	Toward	
9646	CCN01-20120610-105150-event0037-3of3	CCN	CCN01	06/10/2012	10:51:50	Motion Detection	17 C	Last Quarter	11	1	Homo sapiens	NA	HOSA	Toward	
9931	CCN01-20120611-103352-event0038-1of3	CCN	CCN01	06/11/2012	10:33:52	Motion Detection	16 C	Last Quarter	62	1	Odocoileus hemionus	NA	DEER	Away	
9932	CCN01-20120611-103353-event0038-2of3	CCN	CCN01	06/11/2012	10:33:53	Motion Detection	16 C	Last Quarter	62	1	Odocoileus hemionus	NA	DEER	Away	
9933	CCN01-20120611-103354-event0038-3of3	CCN	CCN01	06/11/2012	10:33:54	Motion Detection	16 C	Last Quarter	62	1	Odocoileus hemionus	NA	DEER	Away	
10313	CCN01-20120612-180658-event0039-1of3	CCN	CCN01	06/12/2012	18:06:58	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10314	CCN01-20120612-180659-event0039-2of3	CCN	CCN01	06/12/2012	18:06:59	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10315	CCN01-20120612-180700-event0039-3of3	CCN	CCN01	06/12/2012	18:07:00	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10316	CCN01-20120612-180702-event0040-1of3	CCN	CCN01	06/12/2012	18:07:02	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10317	CCN01-20120612-180703-event0040-2of3	CCN	CCN01	06/12/2012	18:07:03	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10318	CCN01-20120612-180704-event0040-3of3	CCN	CCN01	06/12/2012	18:07:04	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10319	CCN01-20120612-180709-event0041-1of3	CCN	CCN01	06/12/2012	18:07:09	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10320	CCN01-20120612-180710-event0041-2of3	CCN	CCN01	06/12/2012	18:07:10	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10321	CCN01-20120612-180711-event0041-3of3	CCN	CCN01	06/12/2012	18:07:11	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10322	CCN01-20120612-180712-event0042-1of3	CCN	CCN01	06/12/2012	18:07:12	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10323	CCN01-20120612-180713-event0042-2of3	CCN	CCN01	06/12/2012	18:07:13	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10324	CCN01-20120612-180714-event0042-3of3	CCN	CCN01	06/12/2012	18:07:14	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10325	CCN01-20120612-180716-event0043-1of3	CCN	CCN01	06/12/2012	18:07:16	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10326	CCN01-20120612-180717-event0043-2of3	CCN	CCN01	06/12/2012	18:07:17	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10327	CCN01-20120612-180718-event0043-3of3	CCN	CCN01	06/12/2012	18:07:18	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10328	CCN01-20120612-180719-event0044-1of3	CCN	CCN01	06/12/2012	18:07:19	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10329	CCN01-20120612-180720-event0044-2of3	CCN	CCN01	06/12/2012	18:07:20	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10330	CCN01-20120612-180721-event0044-3of3	CCN	CCN01	06/12/2012	18:07:21	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10331	CCN01-20120612-180722-event0045-1of3	CCN	CCN01	06/12/2012	18:07:22	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10332	CCN01-20120612-180723-event0045-2of3	CCN	CCN01	06/12/2012	18:07:23	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10333	CCN01-20120612-180724-event0045-3of3	CCN	CCN01	06/12/2012	18:07:24	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	
10334	CCN01-20120612-180726-event0046-1of3	CCN	CCN01	06/12/2012	18:07:26	Motion Detection	16 C	Last Quarter	63	1	NA	NA	UNKN	Unknown	

Ready | ImageDataExport-Excel-20sep2012 | Count: 2 | 100% | 4:00 PM 9/20/2012

DATA SUMMARY FROM THREE SITES





SMALL ANIMALS

2012-05-22 10:12:00 PM M 3/3

16°C



SPP03

2012-06-08 10:27:11 PM M 1/3

17°C



VCS01

RECONYX

2012-05-17 8:44:10 AM M 3/3

16°C



2012-06-06 4:02:53 PM M 3/3

23°C



VCS01

2012-06-20 12:05:00 PM T

22°C

2012-06-03 10:32:54 AM M 3/3



VCN01



VCN02

RECONYX

RECONYX

2012-06-14 4:48:44 PM M 3/3 0 23°C



VCS01

BECONYX

00 AM T 0 17°C



SPP01

BECONYX

2012-06-09 8:26:19 AM M 2/3

18°C



CCS03

RECONYX

LARGER ANIMALS



2012-05-17 6:34:40 AM M 2/3

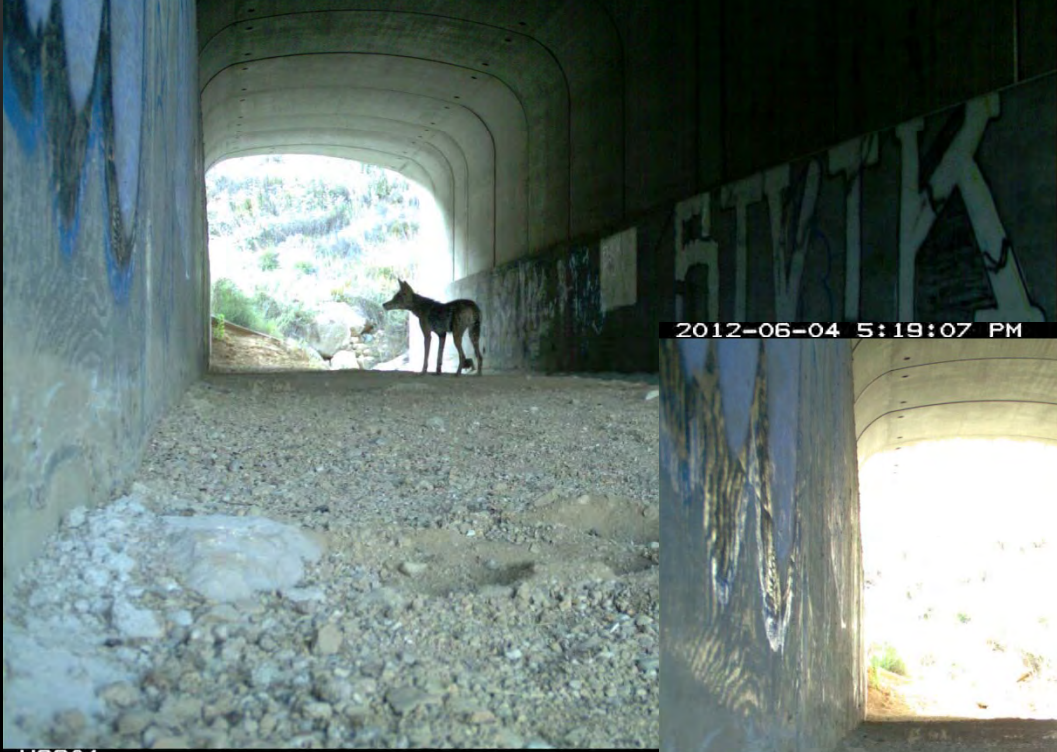
0 12°C



SFP03

RECONYX

2012-06-03 6:45:41 PM M 2/3 21°C



VCS01

2012-06-04 5:19:07 PM M 2/3 21°C



VCS01

RECONYA

2012-05-16 1:38:41 AM M 2/3

40 12°C



SPFO1

RECONYX

2012-08-25 2:14:49 AM M 3/3



SFP03

39:23 AM M 2/3

40 24°C



VCMO1

RECONYX

2012-06-20 3:03:53 AM M 2/3 15°C



VCN02

2012-07-02 10:00:14 AM M 3/3 18°C



CCS01



HUMAN USE



SFP01

VCS01

SFP01

RECONYA

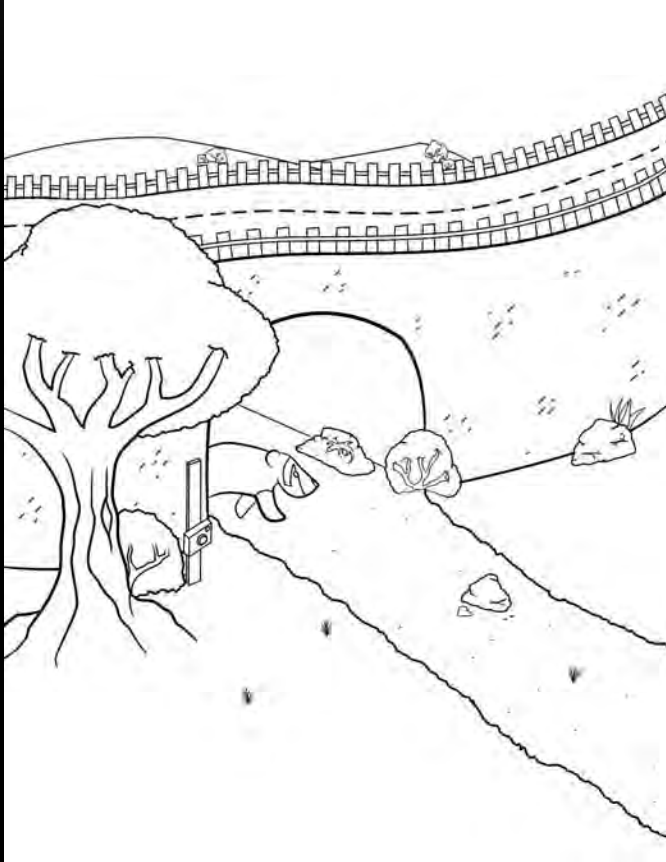
RECONYA

WHAT'S COMING UP NEXT

- Shutdown cameras for the winter
- Put structures in treatment underpasses and allow animals to become habituated
- Resume data collection in the spring
- Image processing...including time lapse images
- Data analysis
- Report results



QUESTIONS



- Acknowledgements:
 - Funding: California Department of Fish & Game (LAG), SANDAG
- Access Granted by:
 - City of San Diego
 - City of Escondido
 - County of San Diego
 - Mission Trails Regional Park
- Additional Thanks to:
 - Derrick Miranda
 - Megan Jennings, SDSU
 - San Diego Tracking Team
 - Heidi Gutknecht, Ranger, MTRP