

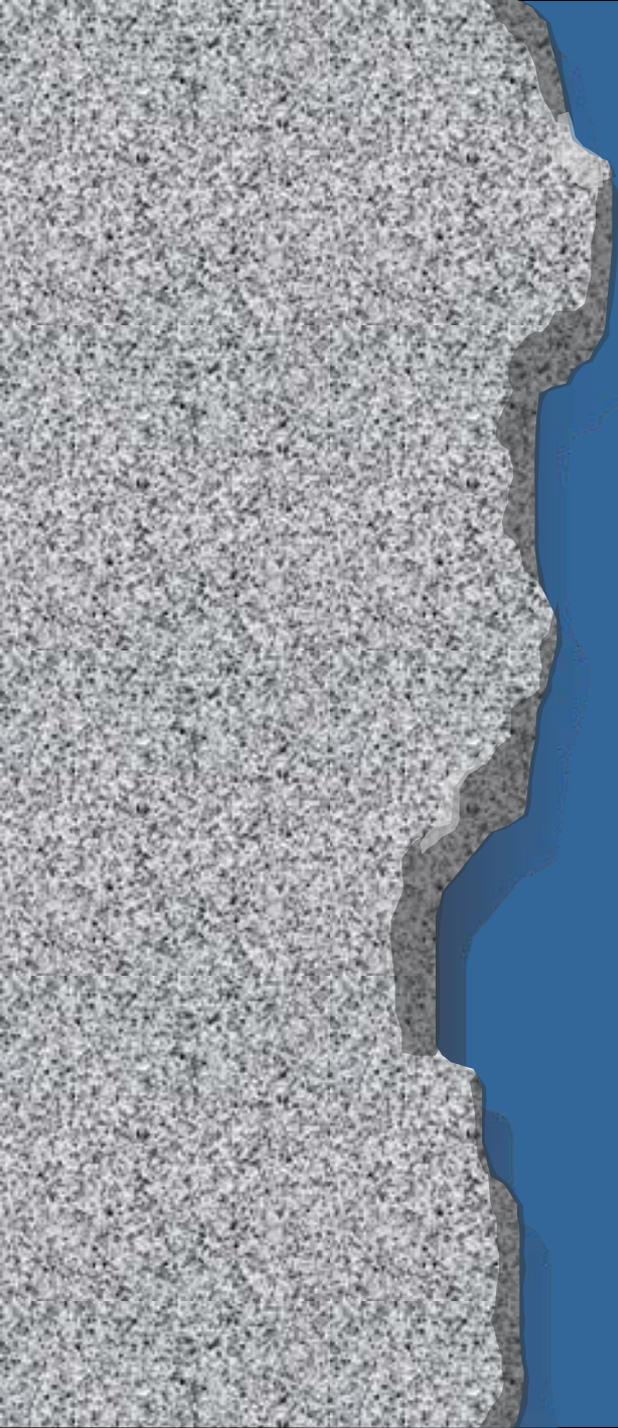
Implementation of Line Distance Sampling Method Throughout the Mojave Desert in 2001

Philip A. Medica, P. Stephen Corn, and
Ronald W. Marlow



U.S. Fish & Wildlife Service
U.S. Geological Survey
University of Nevada, Reno





Acknowledgements

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U.S. Fish & Wildlife Service, Regions 1 & 6

Fort Irwin National Training Center

Desert Managers Group

Mojave Desert Ecosystem Program

Charis Corporation

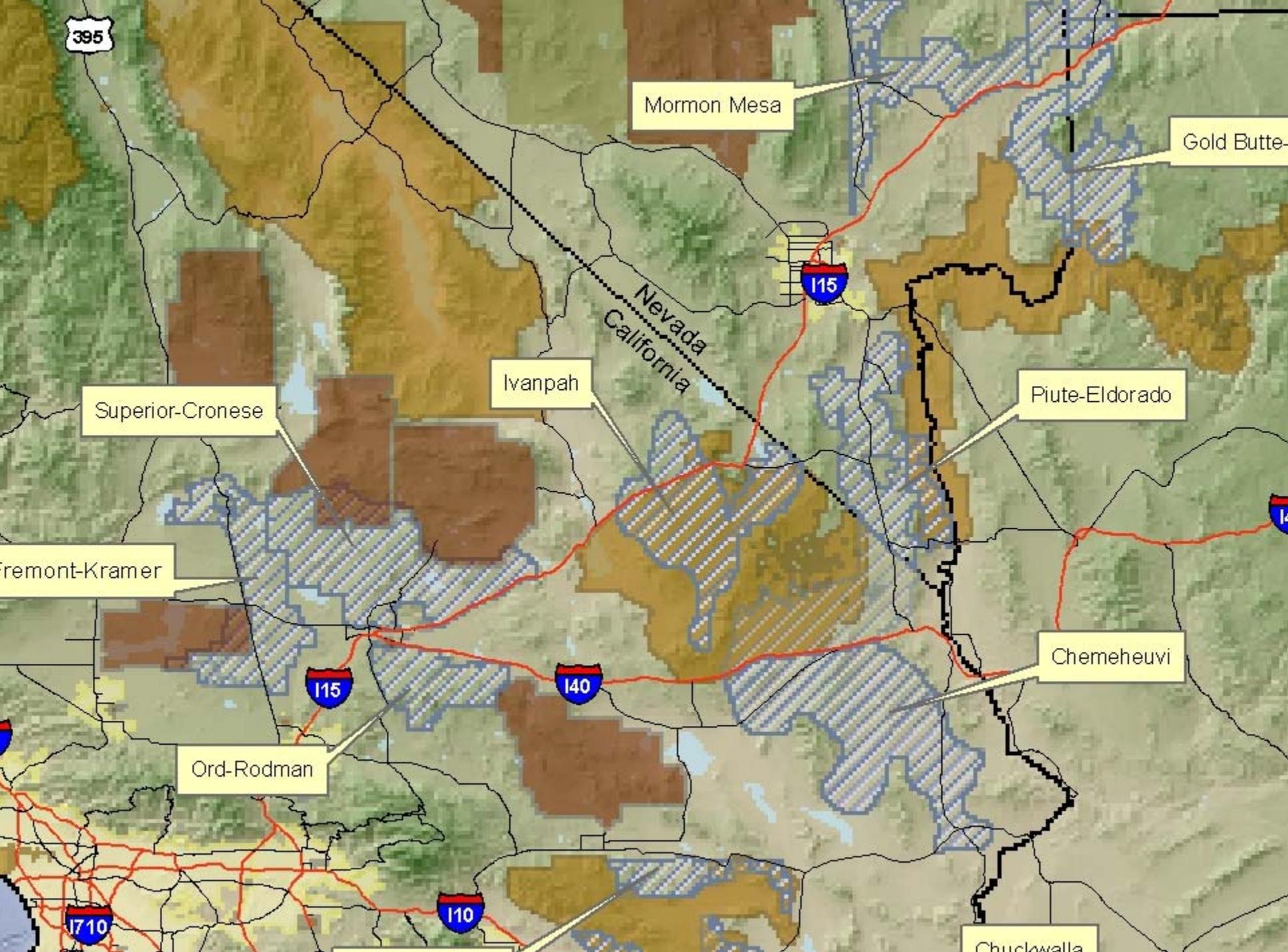
Clark County, NV. Habitat Conservation Plan

Washington County, UT. HCP

Student Conservation Association

Background

- 1990: Desert tortoise listed as threatened
- 1994: Critical habitat designated
- 1994: Final recovery plan approved
- 1998: Comprehensive workshop held on Line Distance Sampling method
- 1999: Desert Tortoise MOG accepts Line Distance Sampling methodology



395

Mormon Mesa

Gold Butte

I15

Nevada
California

Ivanpah

Superior-Cronese

Piute-Eldorado

Fremont-Kramer

I15

I40

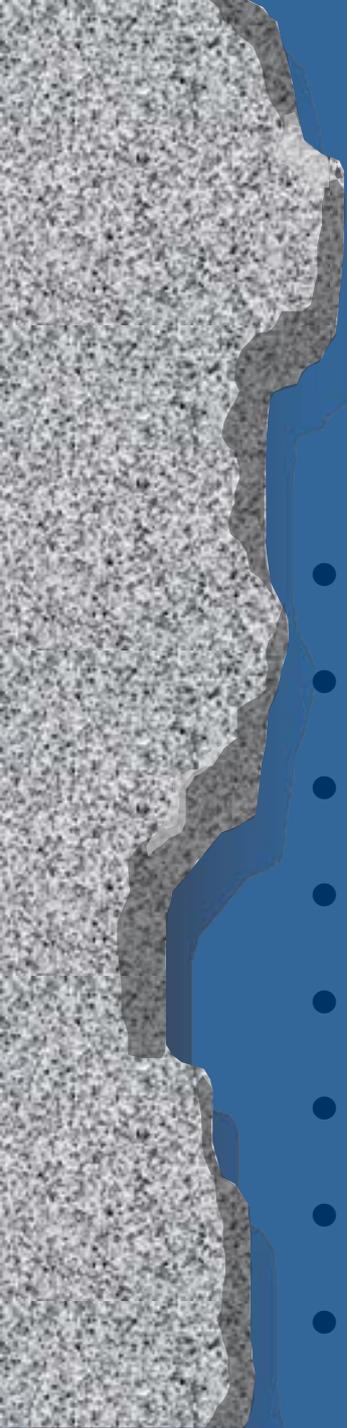
Chemeheuvi

Ord-Rodman

I710

I10

Chuckwalla



Desert Tortoise Management Oversight Group Signatories

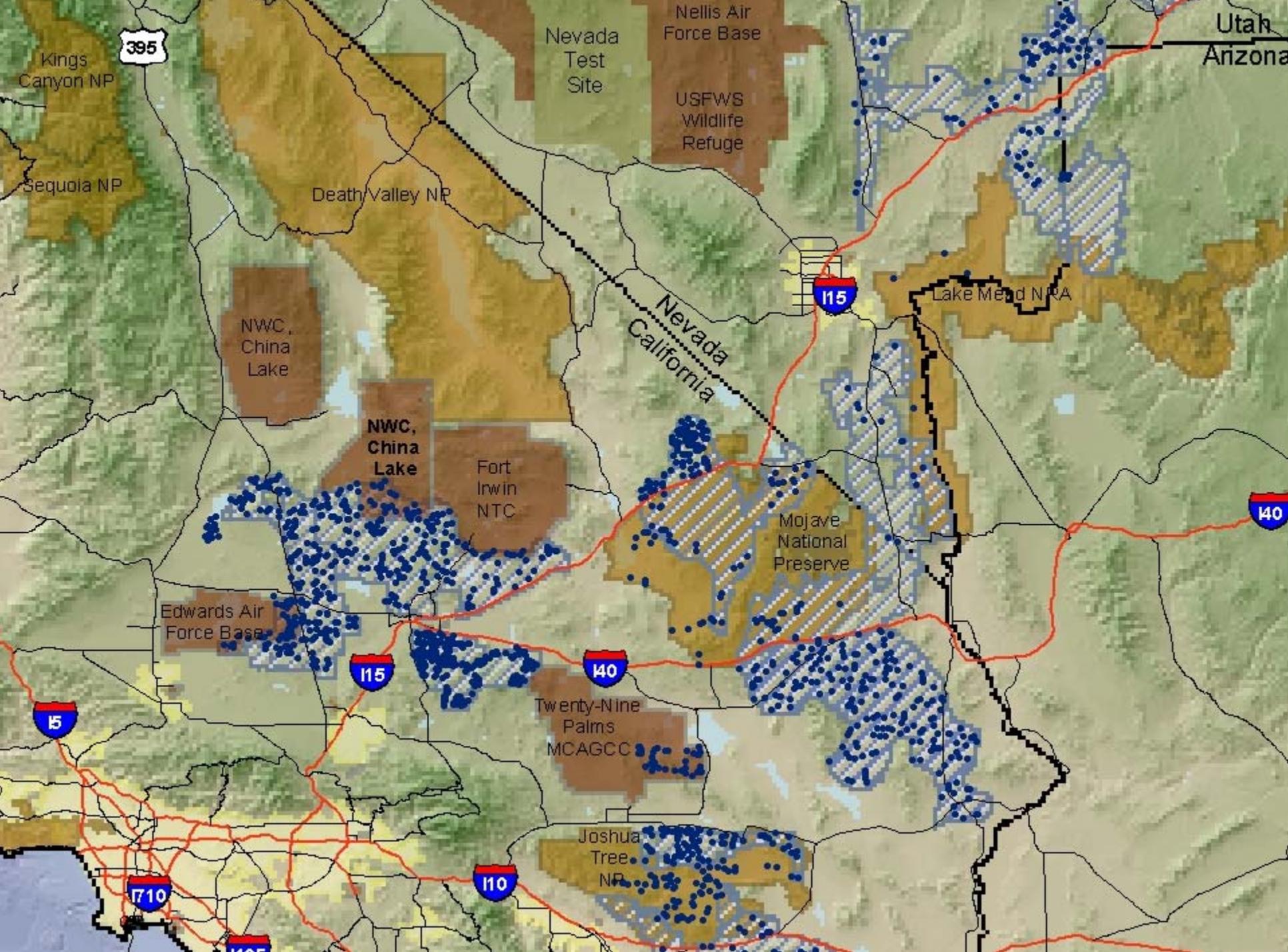
- BLM State Directors (CA, AZ, NV, UT)
- BLM Washington Office T&E Specialist
- State Wildlife Agencies (CA, AZ, NV, UT)
- USFWS Field Supervisors (Regions 1,2,6)
- USGS- Western Ecological Research Center
- National Park Service-Joshua Tree NP
- National Training Center- Fort Irwin
- Twentynine Palms Marine Base-MCAGCC

Accomplishments 2000-2001

- Desert Tortoise Coordinator-August 2000
- Implementation meetings rangewide Fall 00
- MOG/TAC Workshop-January 2001
- Field personnel workshop/training Mar. 01
- GSA contract for Line Distance Sampling
- All Recovery Units sampled in 2001 using Line Distance method

Expectations for 2001

- Implement LDS in each Recovery Unit
- Determine encounter rate for each RU
- Support centralized Data Management
- Determine $g_{(o)}$ within each Recovery Unit



Utah
Arizona

395

Kings Canyon NP

Sequoia NP

Death Valley NP

Nevada Test Site

Nellis Air Force Base

USFWS Wildlife Refuge

NWC, China Lake

NWC, China Lake

Fort Irwin NTC

Nevada
California

I15

Lake Mead NRA

I40

Edwards Air Force Base

I15

I40

Mojave National Preserve

I5

Twenty-Nine Palms MCAGCC

I710

I10

Joshua Tree NP

I805

Results of 2001 Sampling (Encounter Rates)

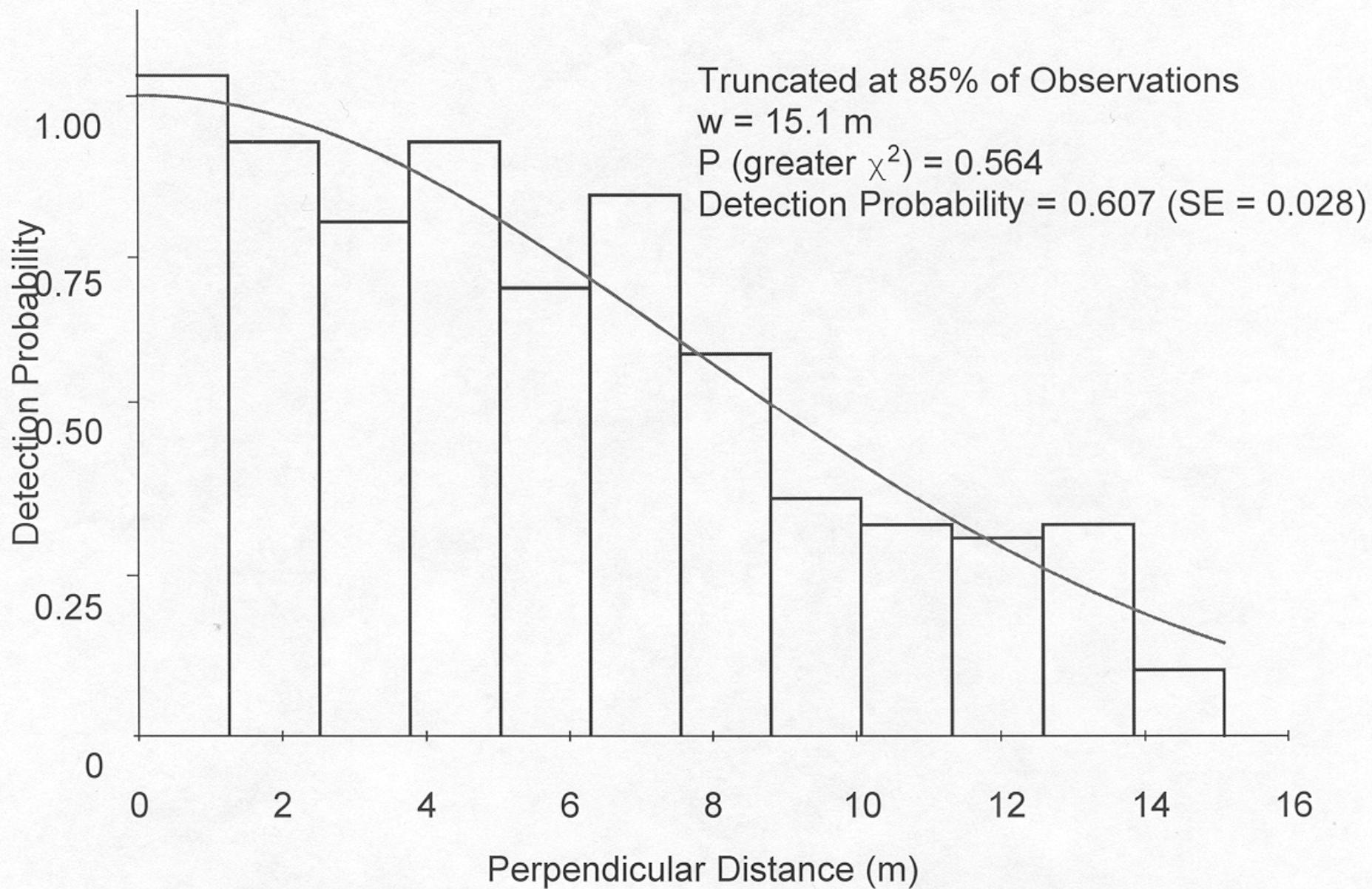
- West Mojave
 - Fremont/Kramer 0.15
 - Superior/Cronese 0.12
 - Ord/Rodman 0.18
 - Pinto Mountain 0.16
 - Joshua Tree Nat. Park 0.11
 - Twentynine Palms 0.15

Encounter Rates (cont.)

- Eastern Colorado
 - Chuckwalla 0.12
 - CMAGR 0.32
- Northern Colorado
 - Chemehuevi 0.17
- East Mojave
 - Mojave National Preserve 0.13
 - Shadow Valley 0.05
 - Piute/Eldorado 0.07

Encounter Rates (cont.)

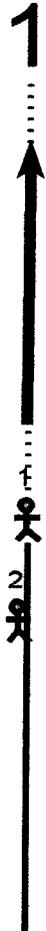
- Northeast Mojave
 - combined 0.10
 - Beaver Dam Slope 0.06
- Upper Virgin River
 - City Creek* 0.70
- 2001 Rangewide
 - Mean Encounter Rate* 0.13



Sampling Methodology 2002

- Conduct Two 2.0 km square transects
- Transects use a common point of origin
- Buffer point of origin by 700 meters
- Two transects sampled during tortoise activity period
- Establish additional $g_{(o)}$ locations in NE Mojave-Mormon Mesa, Gold Butte-Pakoon
- Initiate modeling of $g_{(o)}$ rangewide

100 m

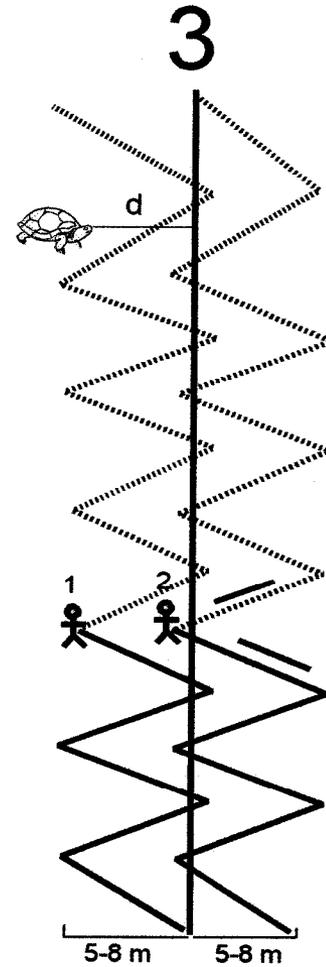


#1 - pull tape to 100m
#2 - follows 5m behind, just to
one side of line

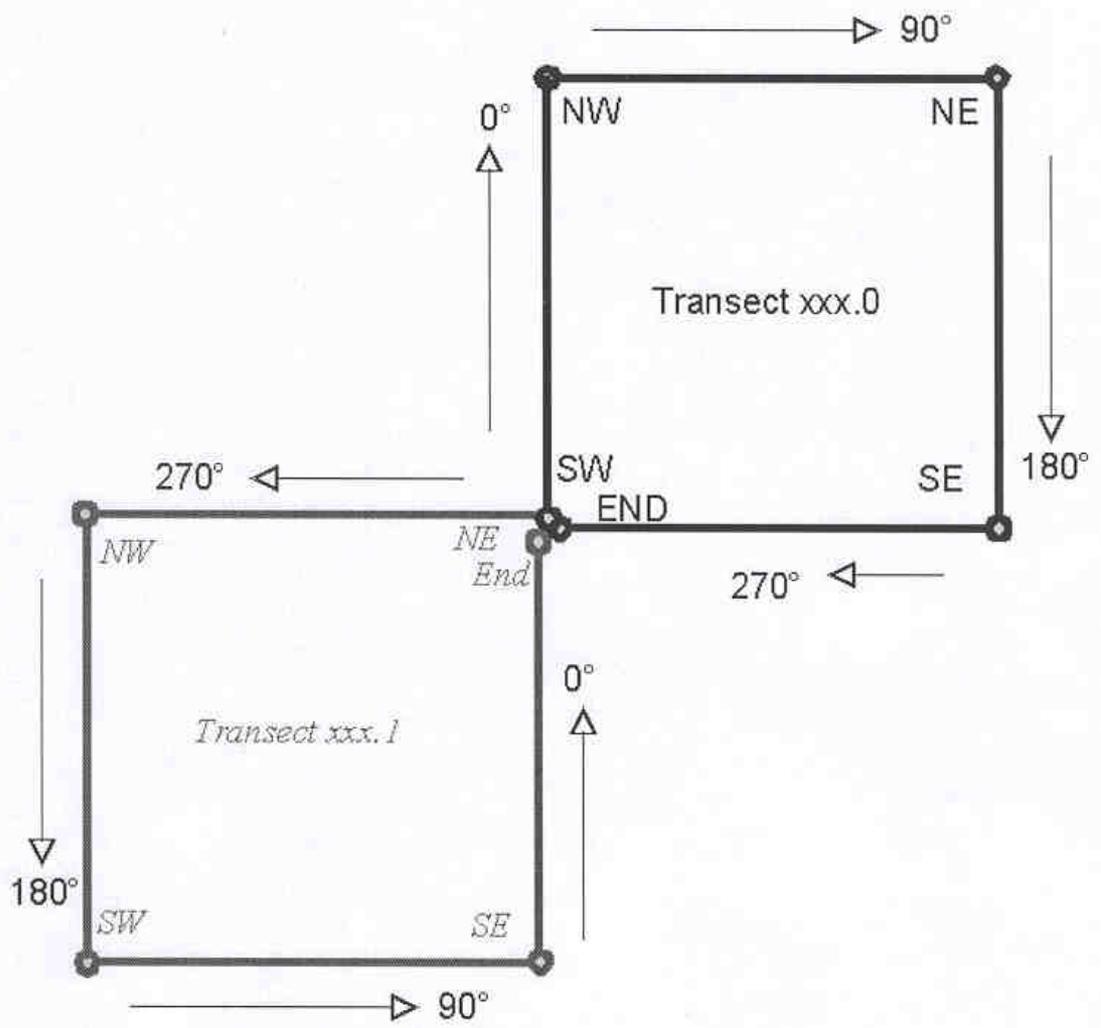
Beginning of 100-m segment;
tape anchored to this spot

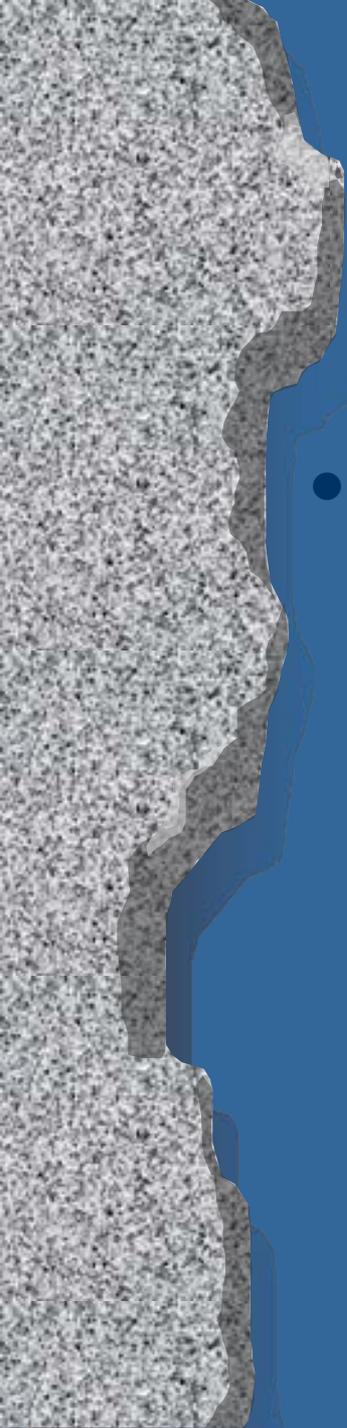


Retrace line to beginning; stay
together on line



Search in a zig-zag pattern out
to 5-8m, then a sharp turn back
toward line. Overlap line slightly.
Stay abreast of partner.





Kilometers needed 2002

- Western Mojave
 - Fremont/Kramer 517
 - Superior/Cronese 654
 - Ord/Rodman 421
 - Pinto Mountain 148
 - Joshua Tree Nat. Park 152
 - Twentynine Palms (MCAGCC) 224

Kilometers Needed 2002 (cont.)

- Eastern Colorado
 - Chuckwalla 403
 - Chocolate Mt.Gunnery Range
- Northern Colorado
 - Chemehuevi 440
- East Mojave
 - Ivanpah 550
 - Fenner-Piute (MNP) 300
 - Fenner-Piute (BLM) 200

Kilometers Needed 2002 (cont.)

- Northeast Mojave
 - Mormon Mesa 440
 - Coyote Springs Valley 200
 - Gold Butte-Pakoon (NV) 200
 - Gold Butte-Pakoon (AZ) 300
 - Beaver Dam Slope (NV) 44
 - Beaver Dam Slope (AZ) 44
 - Beaver Dam Slope (UT) 40

Training

- Training at the Jean, NV March 25-30,2002
- Training lines will be in 3 different locations
- 100 m tape technique used
- Standardized Data sheets
- Data collection using PDAs tested

Preliminary Estimates of Density/km² in 2001

- Western Mojave
- Fremont/Kramer 9.6 + 1.5
- Superior/Cronese 7.6 + 1.4
- Ord/Rodman 11.7 + 1.7
- Pinto Mountain 10.3 + 2.8
- Joshua Tree National Park 7.5 + 1.8
- MCAGCC 9.8 + 2.3

Preliminary Estimates of Density/km² in 2001

- Eastern Colorado
 - Chuckwalla & CMAGR 12.3 + 1.9
- Northern Colorado
 - Chemehuevi 11.1 + 1.7
- East Mojave
 - Mojave National Preserve 4.7 + 2.4
 - Shadow Valley 3.5 + 1.5
- Northeast Mojave 4.1 + 1.1
- Beaver Dam Slope 3.0 + 2.8
- Upper Virgin River

Sampling Methodology

Random Point Criteria

- Include desert tortoise critical habitat and ACECs
- Include areas $\leq 1,250$ meters elevation, excluding *Coleogyne* habitat if possible
- Include areas $\leq 30\%$ slope
- Exclude private land
- Exclude non-habitat areas (e.g. playas)

