

Applying Translocation Science



Kim Field

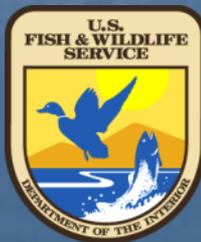
Desert Tortoise Recovery Office
US Fish and Wildlife Service



What is translocation?

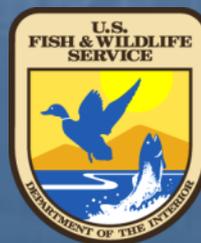
The deliberate human-mediated movement of organisms from one area to free release in another (Seddon et al. 2012)

- No purpose in definition; overarching term
- Motive may be conservation-based or not



Proactive: Population Augmentation

- Driver is proactive & conservation-based
- Population vs individual focus



Recovery Program

U.S. Fish & Wildlife Service

Revised Recovery Plan for the Mojave Population of the Desert Tortoise

(Gopherus agassizii)



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- Develop partnerships
- Protect populations & habitat
- **Augment depleted populations**
- Monitor progress
- Conduct applied research & modeling
- Implement adaptive management program



Strategic Program for Population Augmentation Goals

- Hasten recovery of decimated or extirpated populations following removal of threats
- Maintain tortoise populations in wild for continued study of threats and effectiveness of conservation actions



Reactive:

Conflict with Human Land Use

- Much of the focus to date for tortoises
- Desire to let those individuals live out their lives in wild (prevent “take” of protected species)
- Hope they contribute to wild population



Translocate or Sacrifice



Desert Tortoise Recovery Office's Stance

When applied in reaction to human tortoise conflicts, translocation...

- Is last resort
- ***Not*** a proven minimization measure
- Must be conducted experimentally, ideally within a larger research framework
- Should target depauperate areas



CA DRECP Science Advisors

(Oct 2010)

*In general, moving organisms from one area to another—for example, out of an impact area into a reserve area—is not a successful conservation action and **may do more harm than good** to conserved populations by spreading diseases, stressing resident animals, increasing mortality, and decreasing reproduction and genetic diversity. Transplantation or translocations should be considered a **last recourse** for unavoidable impacts, should **never be considered full mitigation for the impact**, and in all cases **must be treated as experiments** subject to long-term monitoring and management.*



Same scrutiny needed regardless of purpose



Moving forward while accepting some risk

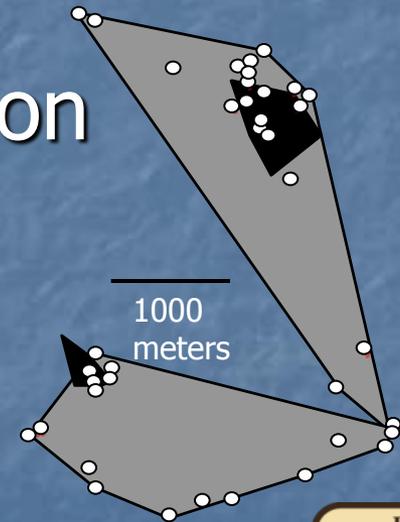
- Translocation as a technique
- Experimental approach
- Site/population selection
- Tortoise selection
- Risk of disease spread
- Where are we headed?



Translocation as a Technique: Initial Successes

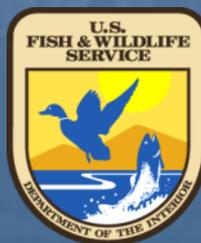
(from Field et al. 2007, Esque et al. 2010, Nussear et al. 2012)

- Survival not different from wild residents
- Typical home ranges by 2nd season
- Appropriate foraging, shelter seeking, and mating behaviors
- 12-yr survival (FWS unpub)



Critical to conduct translocations as experiments

- Can translocated tortoises assist in sustaining populations?
- Did we really minimize risks?
- Are the most important threats understood?



Need to learn from actions

- Design and implementation overseen by qualified scientist
- Ideally fit within larger research framework
- Long-term monitoring



Site Selection

- Habitat (USGS model & on-the-ground assessment)
- Range-wide monitoring data
- Conservation actions in place
- Opportunities (recovery action effectiveness/research)



Depauperate Areas

- ↓ risks to translocated and resident tortoises
- Not poor habitat
 - Conservation actions implemented



Post-translocation Density

- within 1 SD of mean density of nearest recovery unit
- densities based on adults

Recovery Unit	Mean RU Density (tortoises/km ²)	Maximum depleted-area Density
Western Mojave	4.0	2.15
Eastern Mojave	4.2	2.19
Colorado Deserts	5.3	2.79
Northeastern Mojave	2.8	1.63
Upper Virgin River	14.3	10.79



Sources of Tortoises

Project Sites (various locations)

- Wild to wild or wild to quarantine to wild
- Presumed lifetime in wild
- Snapshot health assessment

Desert Tortoise Conservation Center (Las Vegas)

- Captivity (various lengths of time) to wild
- Unknown captive history
- Comprehensive health history post-DTCC arrival



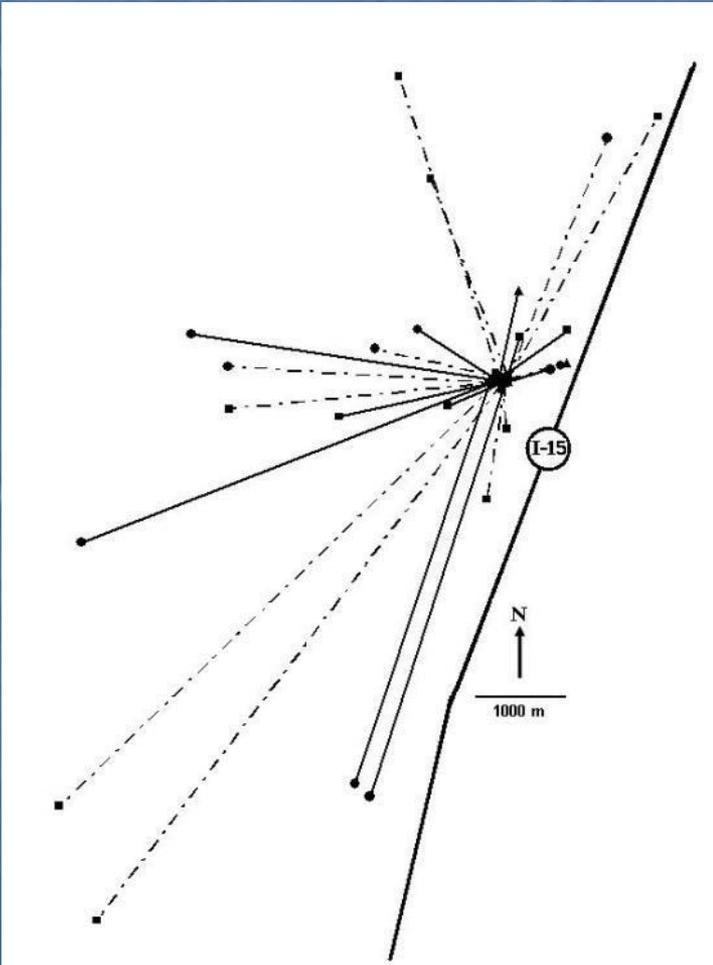
Minimize Risks

(translocated & resident, individuals & population)

- Physiological
- Behavioral
- Genetic
- Disease



Post-translocation Dispersal



Tortoises translocated...

- > 3 km:
6.5 km contains 97.5% of dispersal movements

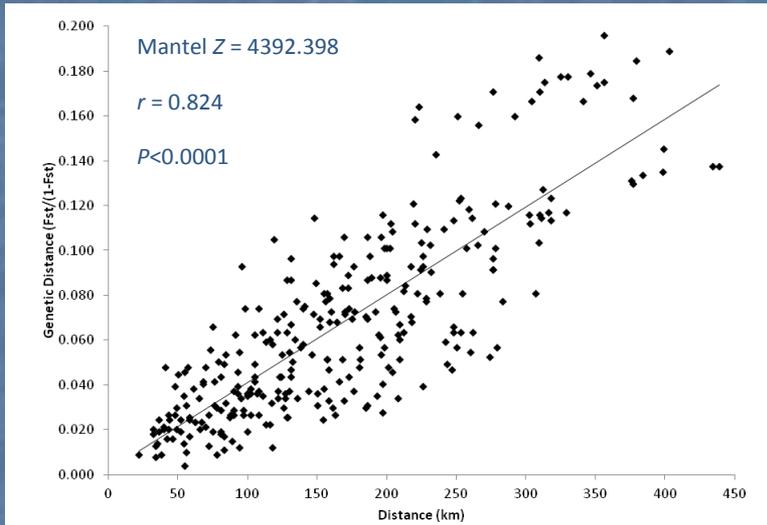
- ≤ 500 m: 1.5 km radius

“penning” not effective



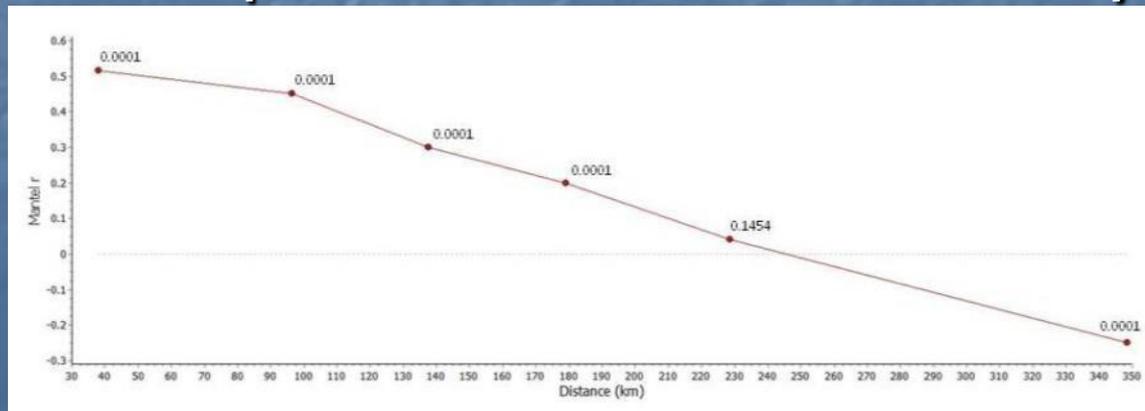
Genetics

from Murphy et al. 2007 and Hagerty and Tracy 2007

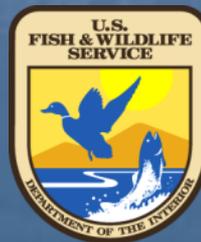


- isolation by distance

Mantel spatial autocorrelation analysis



≤ 200 km wild
 ≤ 175 km DTCC



Disease Risk

- Minimize risks of disease spread
- Risk mitigation strategies



Comprehensive Disease Risk Analysis

- Team of experts assembled fall 2013
- Determine risk tolerance for translocations
- List all plausible agents of concern
- Assess the risk associated with each agent
- Assign a cumulative risk for each agent
- Develop a risk mitigation plan for priority agents



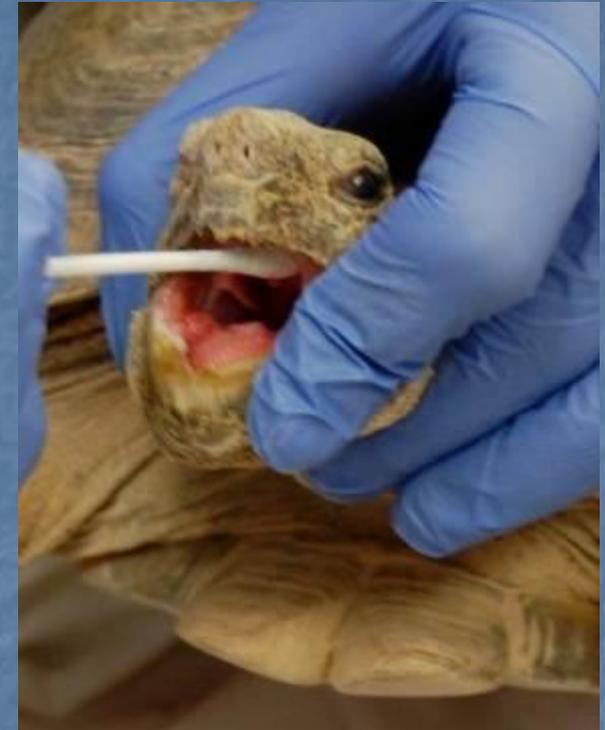
Health Assessments

Physical Exam

- clinical signs
- body condition

Sample Collection & Analysis

- ticks (if present)
- oral swab
- nasal flush
- blood



Health Assessment Training

- course for experienced desert tortoise biologists
- lectures, hands-on practice, written & practical tests of knowledge/skills
- 2011-2013: 66 students



SAN DIEGO ZOO.
GLOBAL



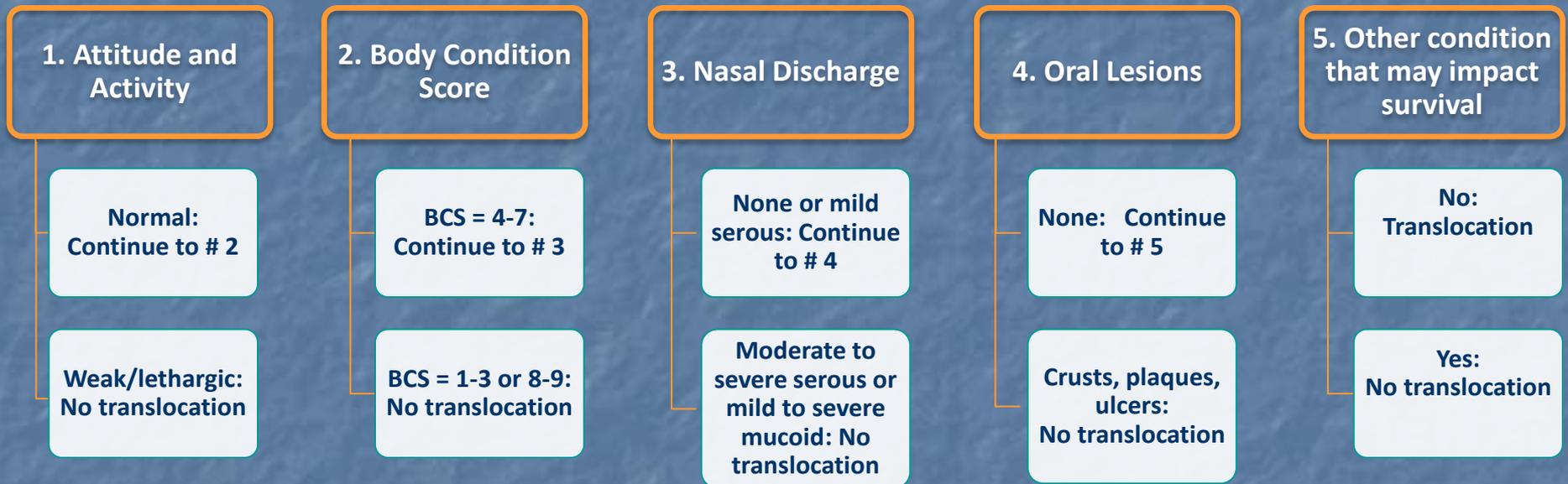
Assessment of Individuals

Could be disqualified from translocation for

- Behavioral abnormality
- Body condition score
- Nasal discharge
- Oral lesions



Algorithm for Evaluating if Desert Tortoises are Suitable for Translocation



BCS 2



Moderate mucoid discharge



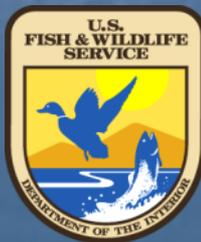
Oral lesion (plaques)



Translocation of Mojave Desert Tortoises from Project Sites: Plan Development Guidance

11 steps

- site selection
- survey efforts
- release protocols
- monitoring



Moving forward with population augmentation using translocation as a proactive conservation tactic



Greater Trout Canyon Area Translocation

Translocation Plan
GREATER TROUT CANYON AREA

Clark County, Nevada

January 29, 2013

Prepared by

Roy C. Averill-Murray, Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service
Kimberleigh J. Field, Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service
Linda J. Allison, Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service
Jennifer M. Germano, Institute for Conservation Research, San Diego Zoo Global

Purpose of translocation: Population Augmentation, Research

Critical Habitat Unit: none

Recovery Unit: Eastern Mojave

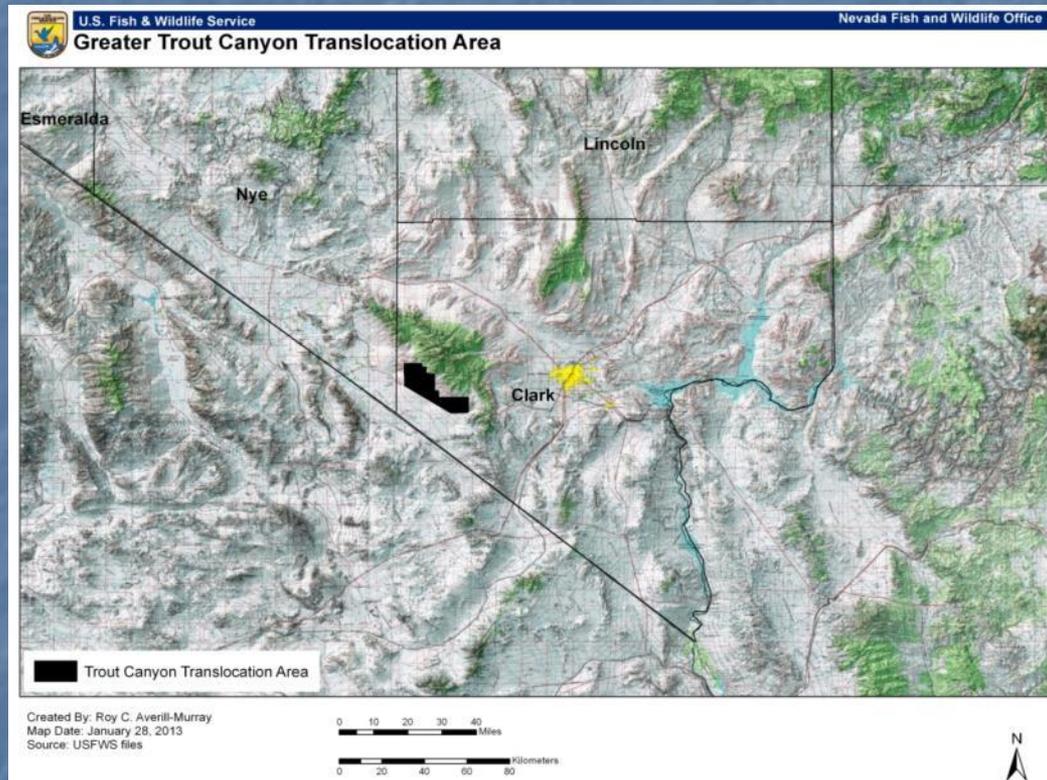
Recipient site land ownership: Bureau of Land Management

Action permitted by federal and state wildlife agencies? (list permits, BOs): Yes
federal: TE-08592A-1 (Douglas G. Myers, Zoological Society of San Diego)
FWSDTRO-1 (Roy Averill-Murray, USFWS – Desert Tortoise Recovery Office)
state: S35185 (Allyson Walsh, Desert Tortoise Conservation Center)
S34362 (USFWS; to be renewed for 2013)
BO: not applicable

Date of proposed translocation: Spring/Fall 2013

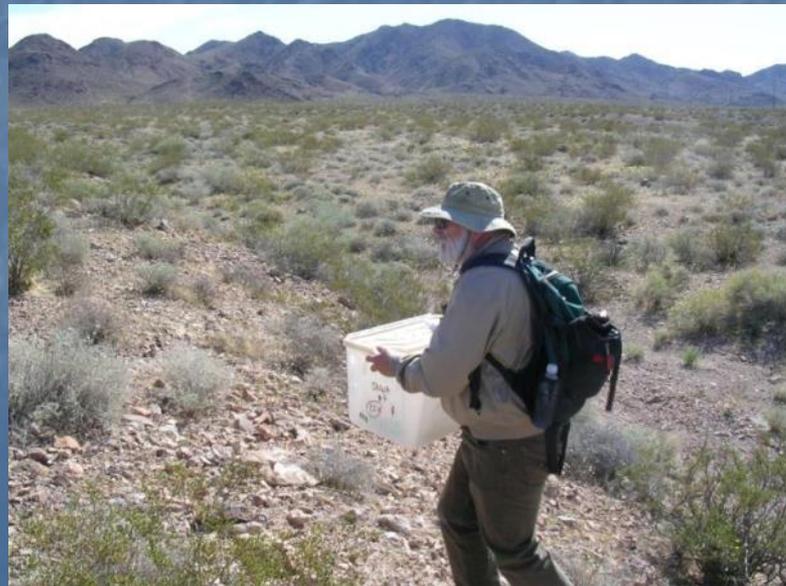
Source of translocatees: Desert Tortoise Conservation Center, Clark County, Nevada

Number of translocatees: Approximately 400 adults, 400 juveniles



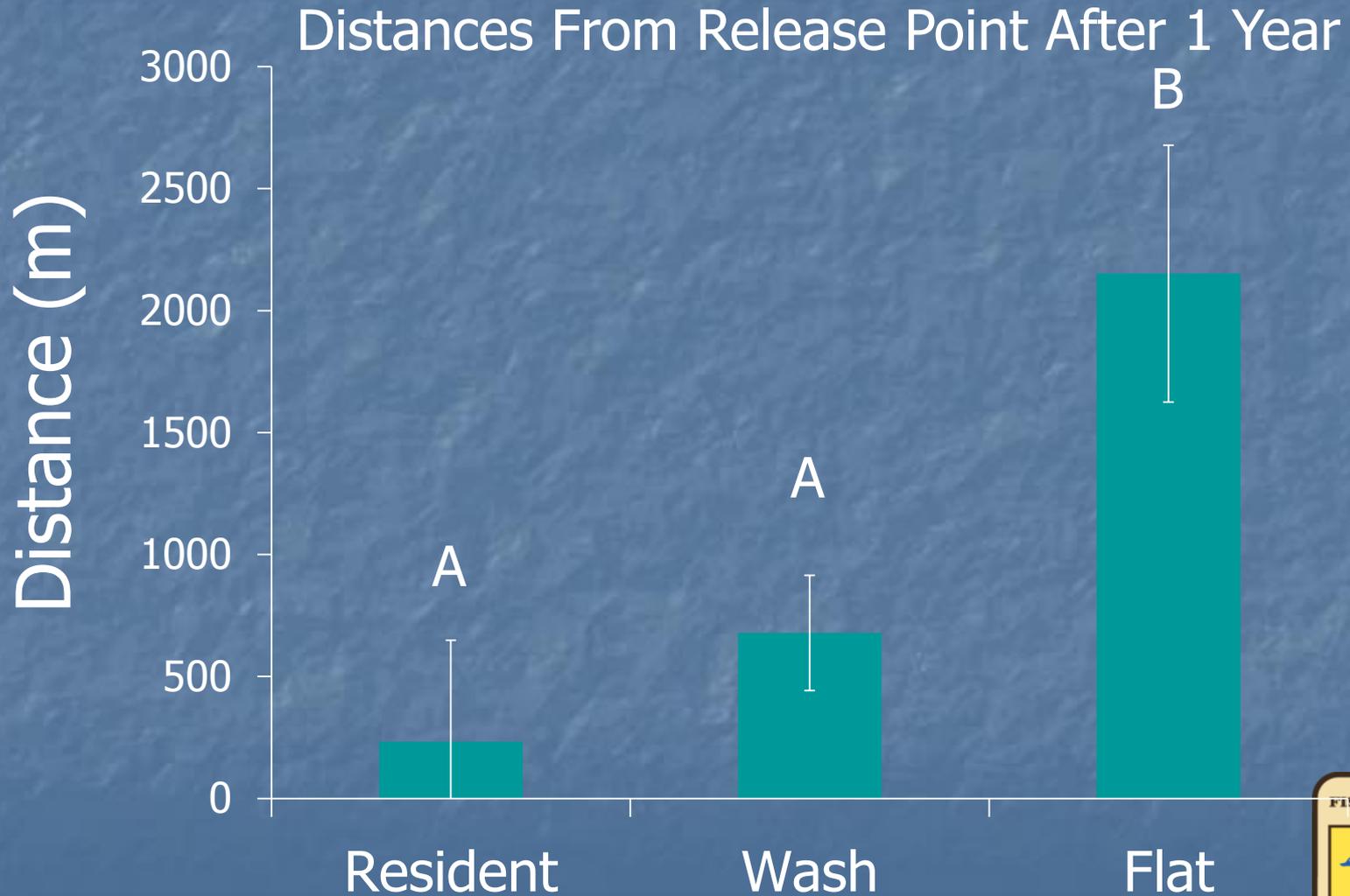
Trout Canyon Augmentation

- Source: DTCC
- Several hundred adults & juveniles
- Subset closely monitored via telemetry
- Population: mark-recapture surveys (yr 1, 2, 5)



Applying Current Research

Effects of Release Habitat



Ongoing Work & Future Directions

- NSF/NIH grant (translocation and transmission)
- Solar energy projects
- Population augmentations + related research



Whether initiated by conservation objectives or human-animal conflict, same scrutiny needed

