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WILDLIFE MONITORING FOR CONTAMINANTS AT LOS ALAMOS NATIONAL LABORATORY

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BIOTA MONITORING METHODS

As part of the environmental surveillance program at LANL, we evaluate impacts to various wildlife species by the following methods:

- Analysis of tissues,
- Analysis of Populations and Species Composition,
- Modeling (estimating radionuclide uptake and dose using data from lower trophic levels),
- Global positioning system (GPS) tracking to determine time spent by big game near impacted sites.

I. Tissue Analysis-Deer and Elk



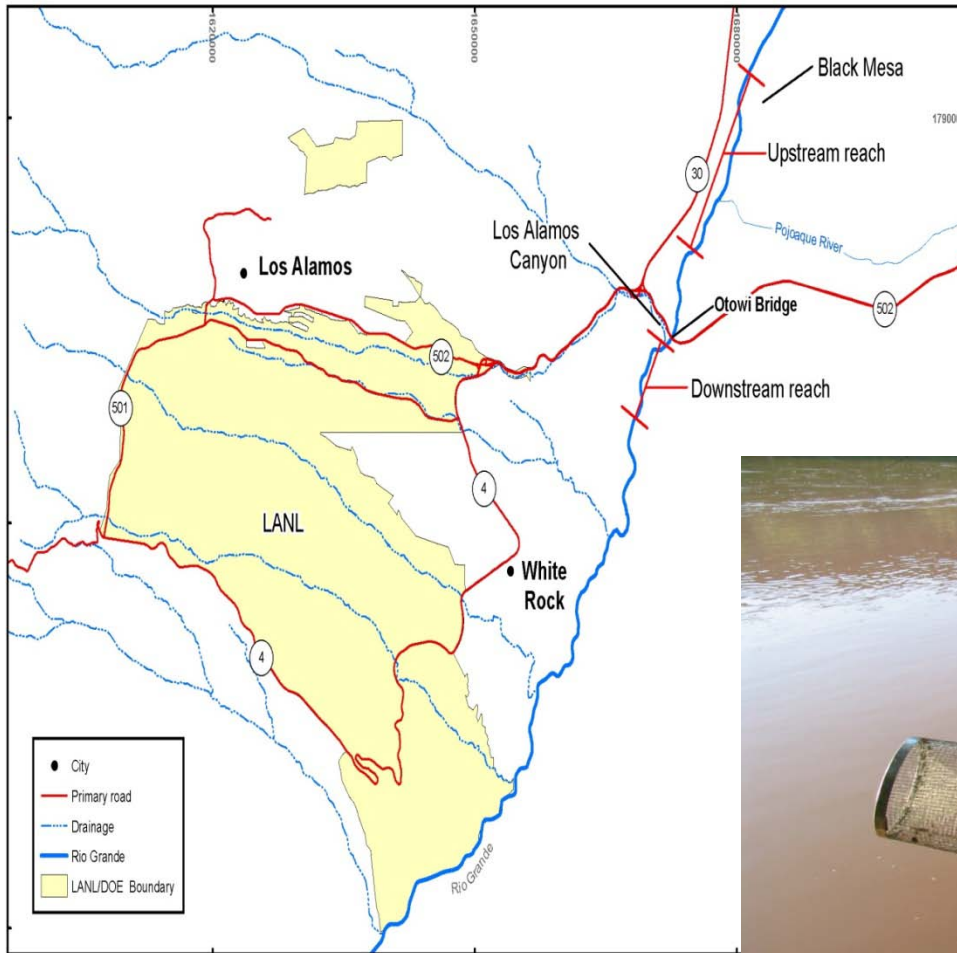
- Data Base = 26 deer and 43 elk from LANL, perimeter, and regional
- Collected as road kills
- Meat analyzed for radionuclides, heavy metals, and polychlorinated Biphenyl's
- Bone analyzed for radionuclides

I. Tissue Analysis-Fish



- Predator and Bottom-Feeding Fish
- Data Base: since the 1970's
- Abiquiu Reservoir, Rio Grande, Cochiti Reservoir
- Meat and bone analyzed for radionuclides
- Meat analyzed for heavy metals and PCBs

I. Tissue Analysis-Crayfish



- Upstream and Downstream of Los Alamos Canyon in Rio Grande
- Whole body, edible, and non-edible parts analyzed for radionuclides, heavy metals, and PCBs



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Slide 5

I. Tissue Analysis-Small Mammals



- Field mice, gophers, rock squirrels
- Field mice are LANLs dose and chemical model—mammal with the smallest home range
- Area G, DARHT, Los Alamos Canyon Weir, Pajarito Flood Retention Structure, Open detonation Sites
- Whole body analyzed for radionuclides, heavy metals, PCBs, Dioxin/Furans, High Explosives.

I. Tissue Analysis-Honey Bees



- Data Base: since the 1970's
- Area G, DARHT
- Whole body analyzed for radionuclides

II. Population and Species Composition-Aquatic Insects



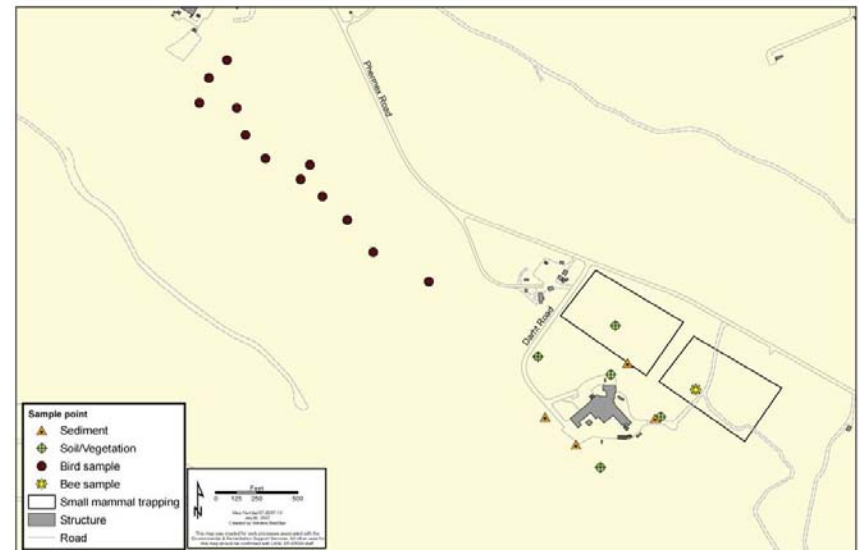
- Benthic macroinvertebrates upstream and downstream of Los Alamos Canyon in Rio Grande
- Indicates quality of the water
- Rock basket samplers



II. Population and Species Composition-Birds



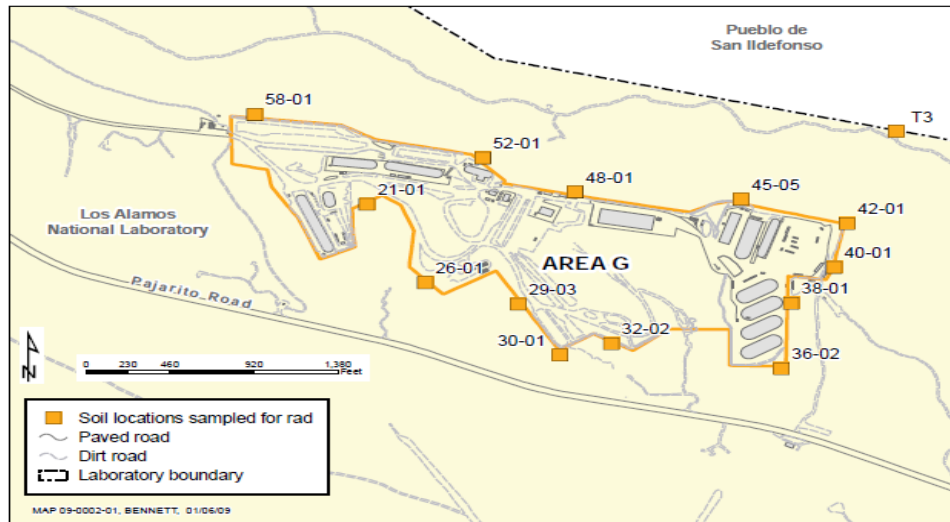
- General ecological stress levels around the vicinity of DARHT that may be associated with facility operations (e.g., noise, disturbance, traffic, etc.)
- The number of birds, bird species, diversity, and evenness (distribution)



III. Modeling

In situations where samples of certain biota cannot be collected for radionuclide tissue analysis, uptake and dose were estimated to these animals using data from lower trophic level components.

- Protected species (e.g., hawks, falcons, and owls). Uptake and dose were estimated using mice data collected from within Area G grounds.
- Non-protected species (e.g., elk and deer). Uptake and dose were estimated using soil, vegetation, and water data collected from around the Area G perimeter.



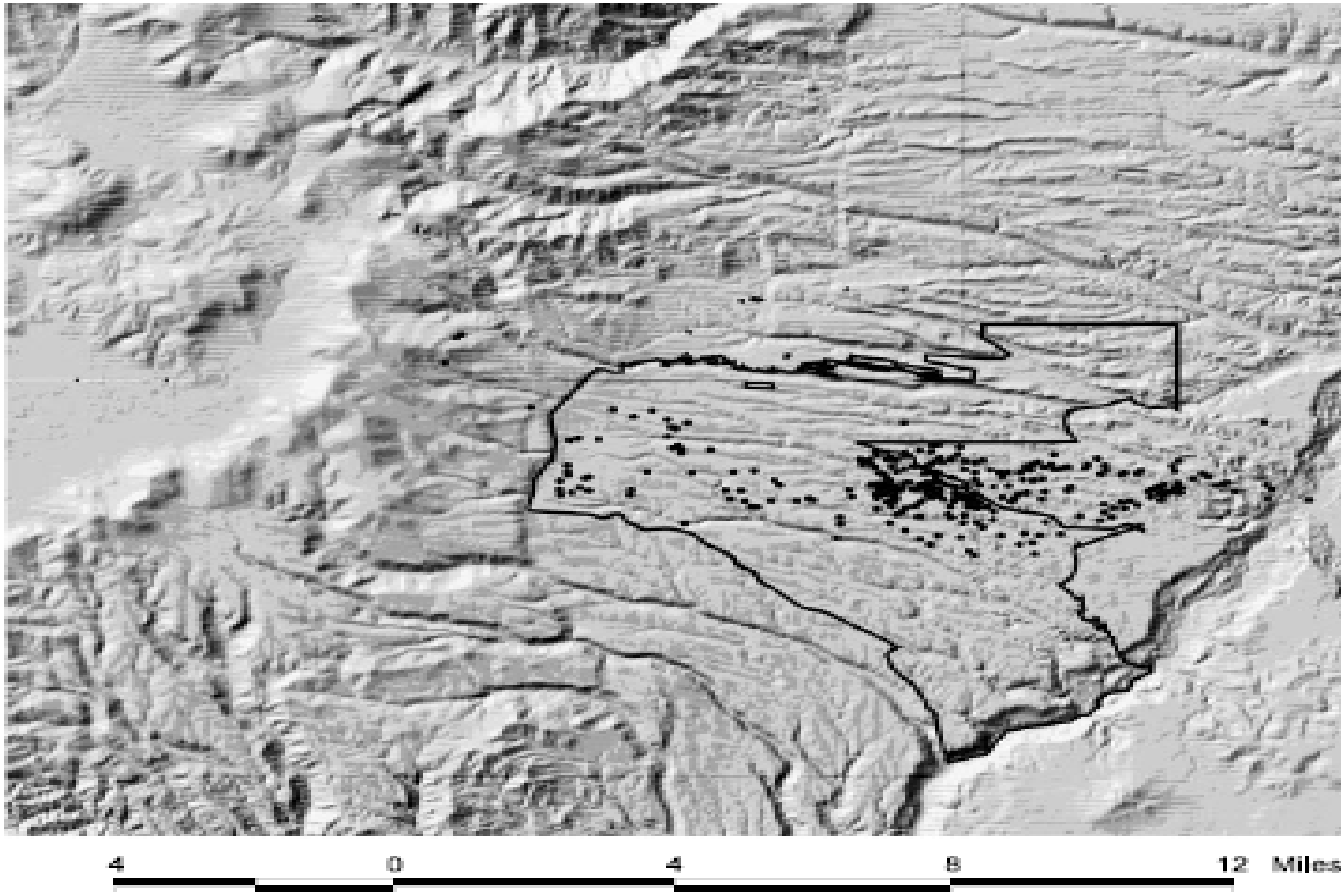
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GPS Radio Collaring



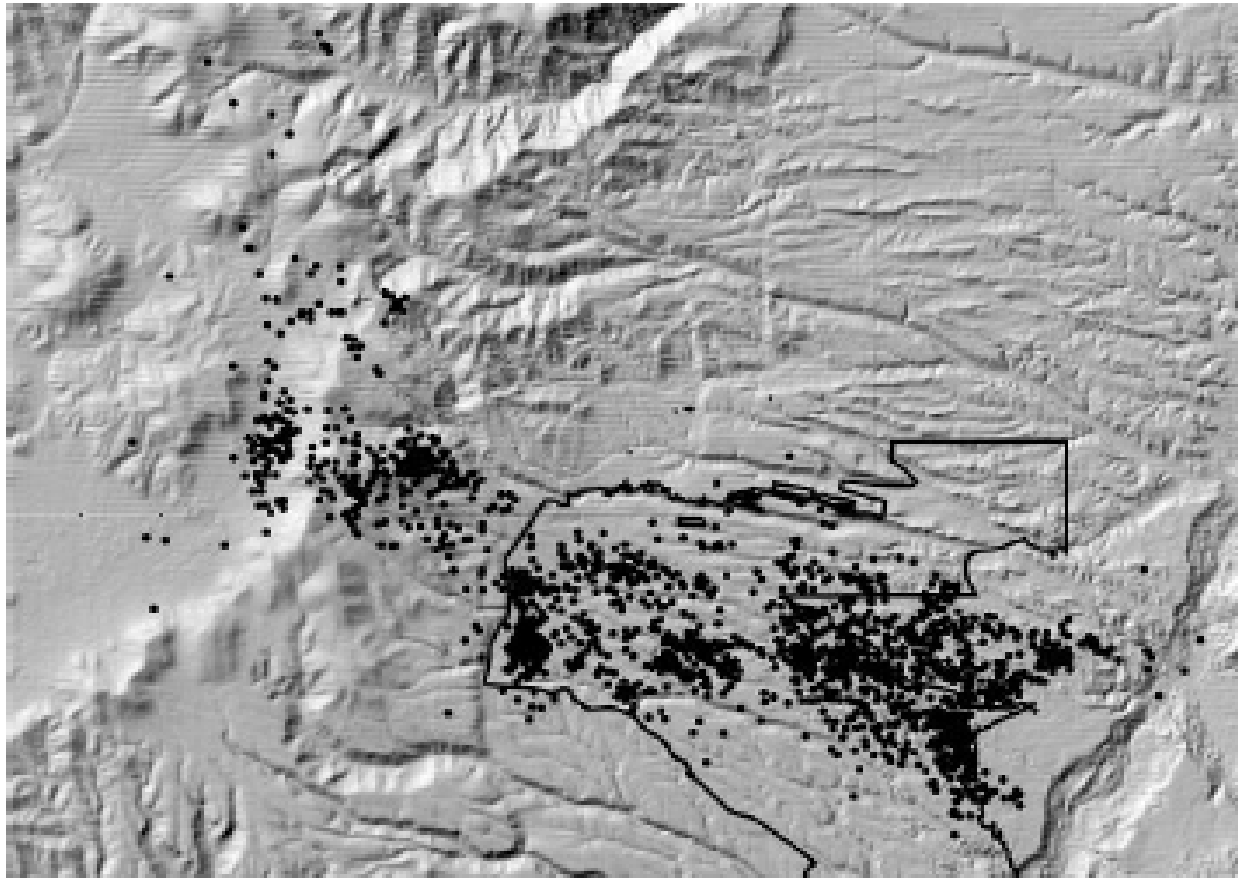
Where and how much
time do elk spend on
LANL lands

GPS Example



- ELK #16034
- 25% at TA-54
- 17% at TA-36

GPS Example



- 12 elk
- 23hr for two yrs

