

Using unmanned aerial vehicles ('drones') to collect data from tagged fishers in the environment



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Introduction

Fishers (*Pekania pennanti*) belongs to the weasel family. In October 2014, the United States Fish and Wildlife Service proposed to list the West Coast Distinct Population Segment of fisher as threatened under the Endangered Species Act.

We wish to **reduce costs** and to **improve the efficiency of fishers tracking** over current methods, which are either tracking animals from the ground (inefficient) or purchasing and maintaining numerous fixed ground receivers to collect GPS data from collars (expensive)."



Vapor 55

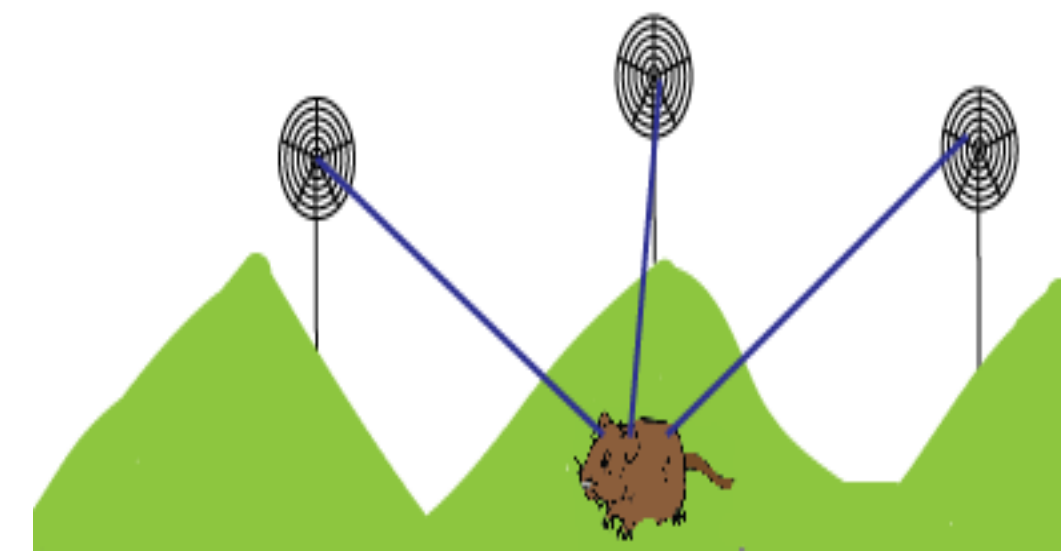


The **Pulse VAPOR55** is an electric Unmanned Aerial Vehicle (UAV). It is capable of automatic flight using pre-programmed mission instructions. The Pulse VAPOR55 can carry customizable payloads of up to 24 lbs, and it can operate at altitudes up to 10,000 feet and can cruise at 25 mph. It is designed for VTOL (vertical take-off and landing) operations.



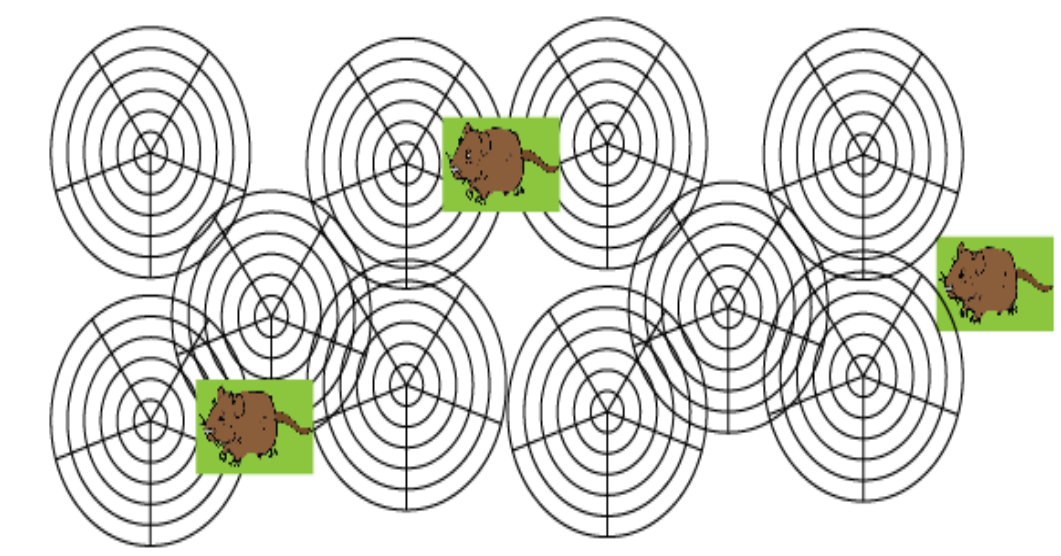
The flight crew will consist of:
+ 1 Air Vehicle Operator (AVO)
+ 1 Mission Operator (MO)
+ 1 Monitor, 1 Observer
+ 1 Payload Operator

Method



Current Method:
Pro: The fixed stations collect the GPS data from the collars of fishers 24/7.

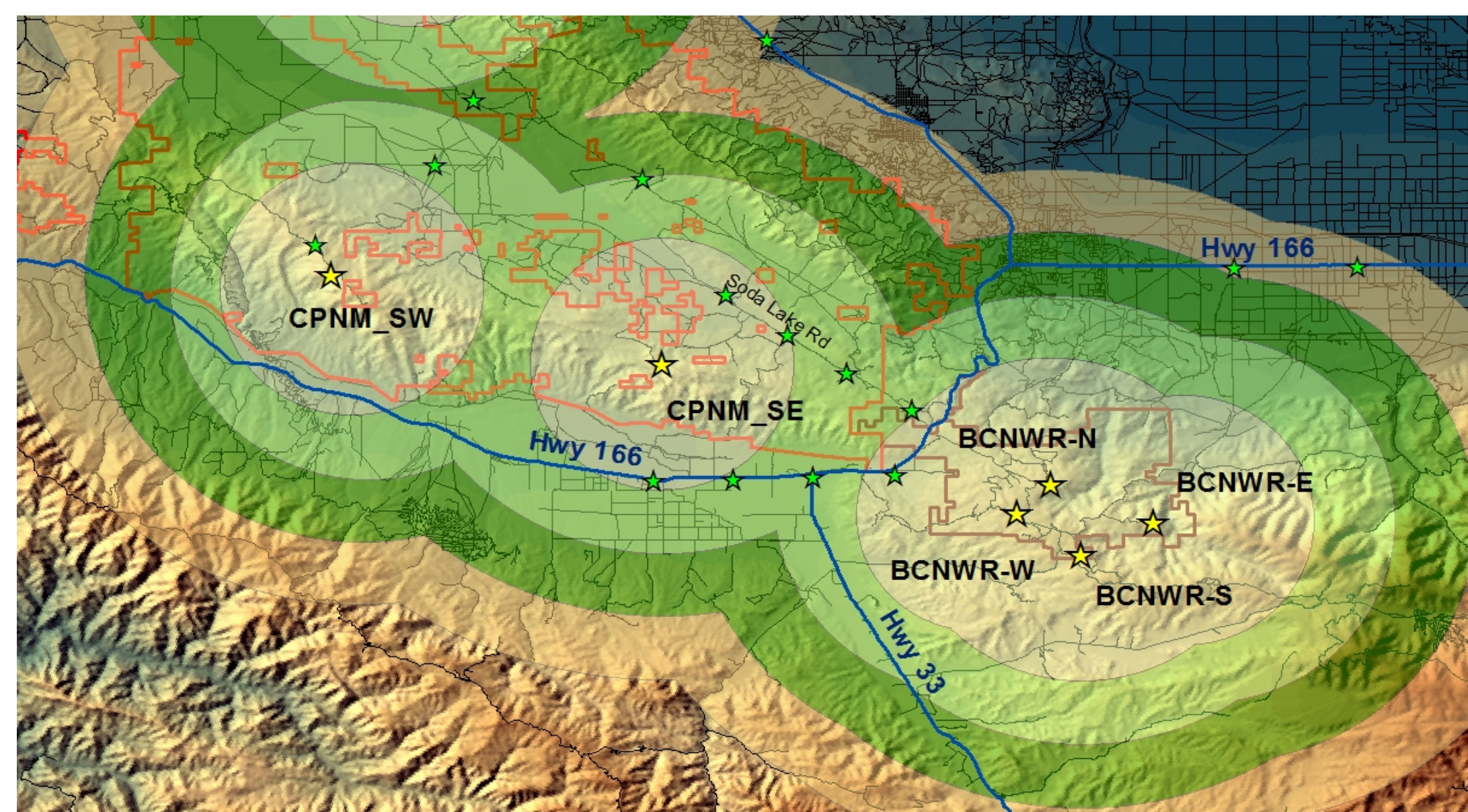
Con: The battery lifespan of collars and fixed stations is short. Required huge amount of the fixed stations in fixed area for better data.



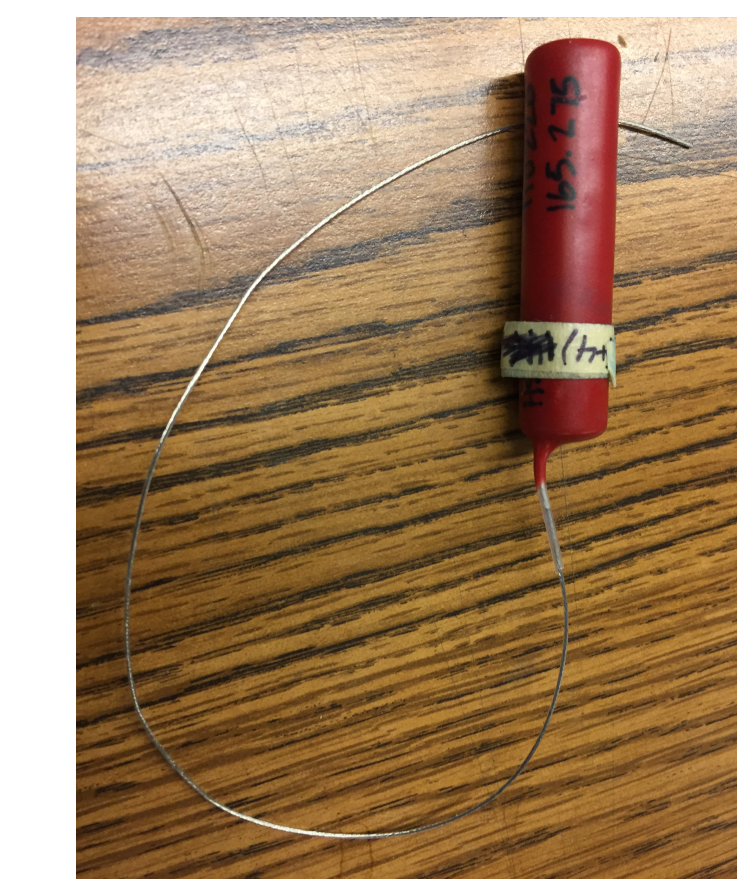
New plan:
Pro: Batteries are only turned on when the drone is flying over. Cover a bigger area in short amount of time.
Con: Do not collect data 24/7



Operational Area -Bitter Creek National Wildlife

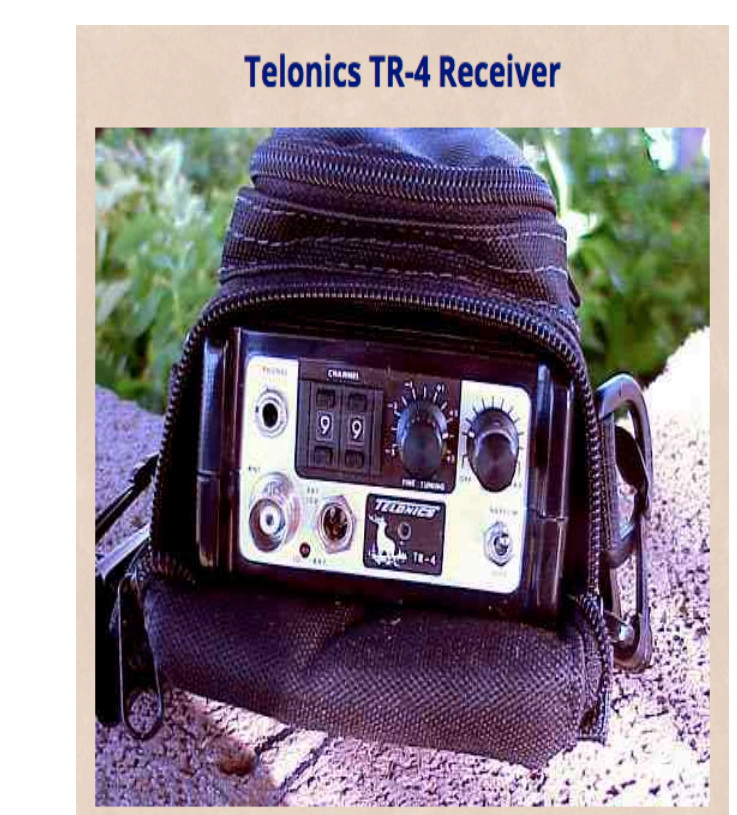


Radio transmitter



We implant the radio transmitters in fishers. The weight is 11 grams. The standard life is 18 months.

Telemetry receiver



The TR-4 is a high performance, inexpensive telemetry receiver. It is small, lightweight, and designed for easy field use.

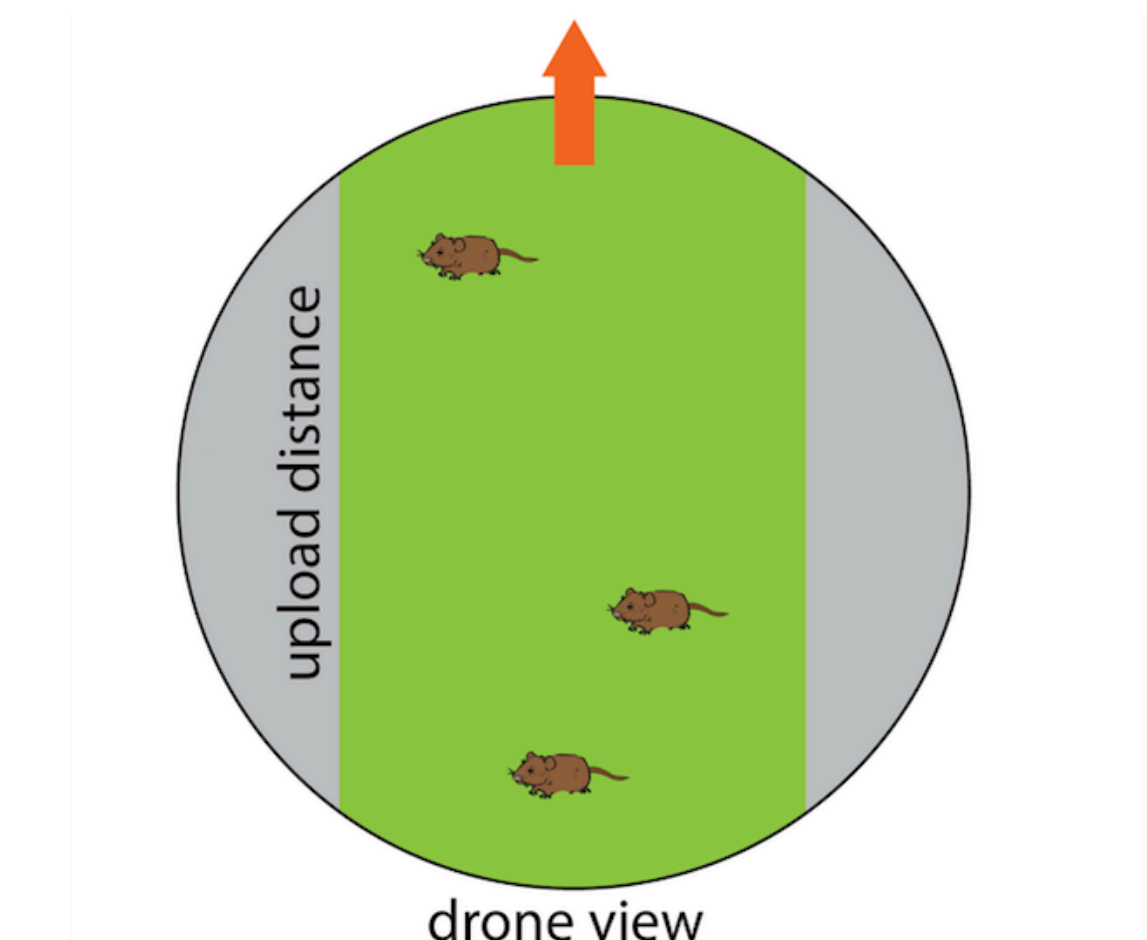
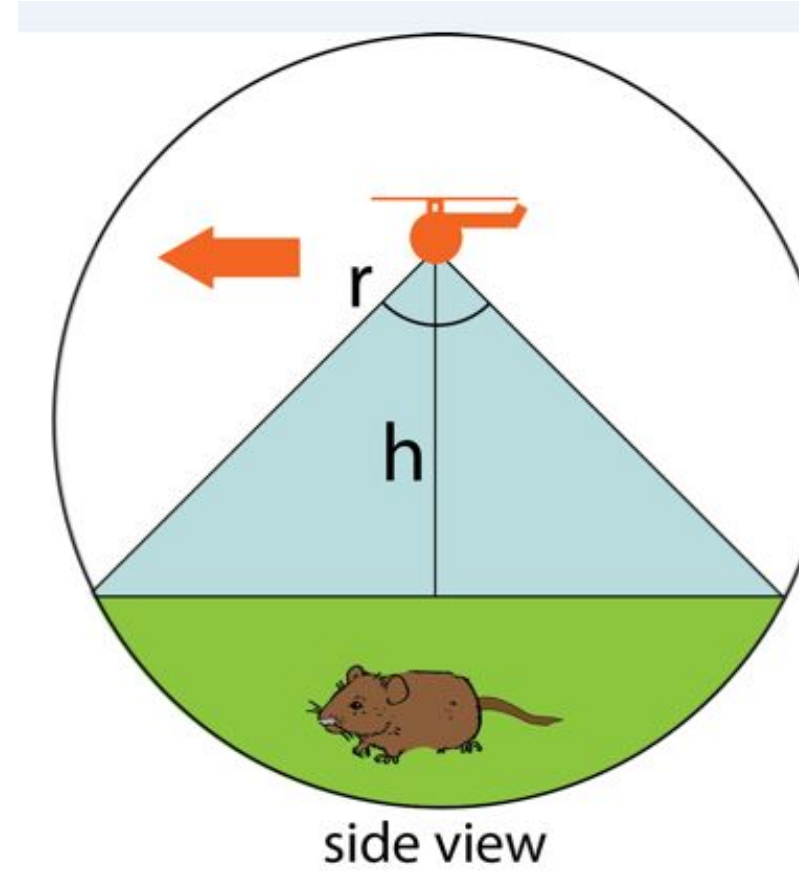
Directional antenna



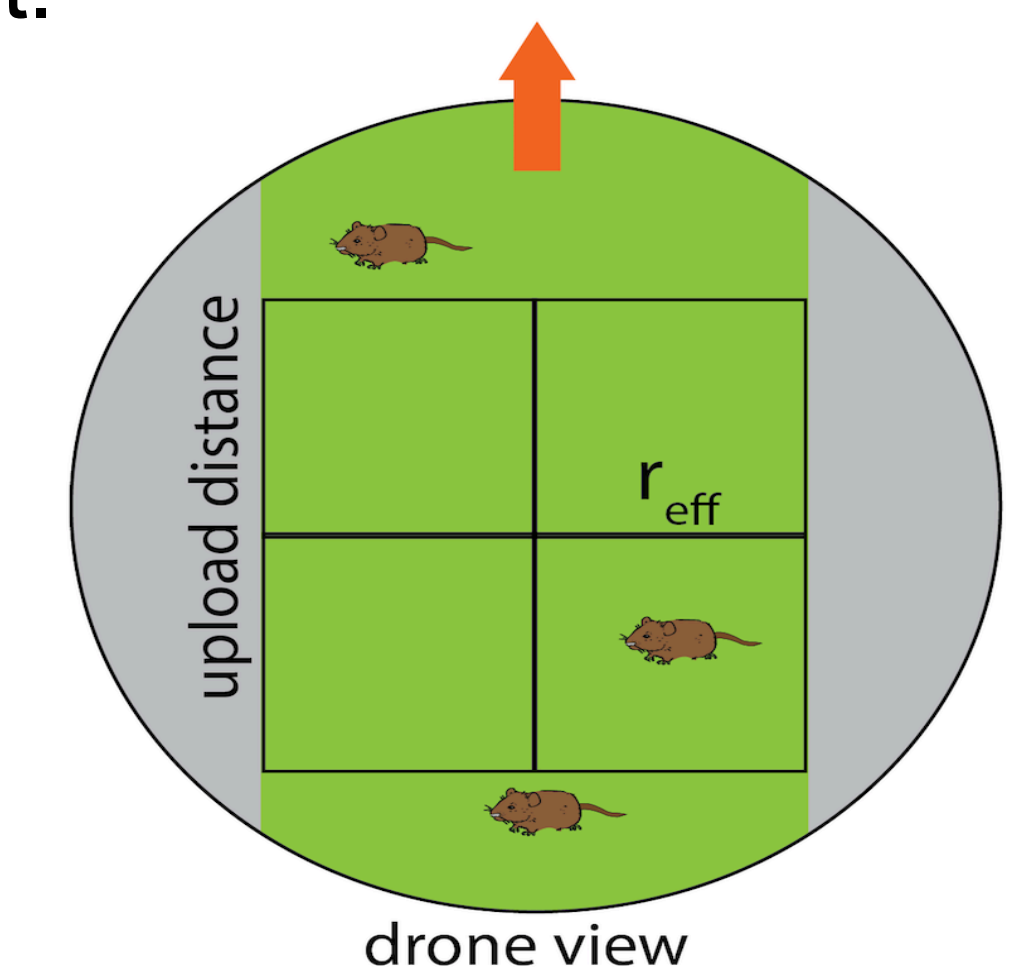
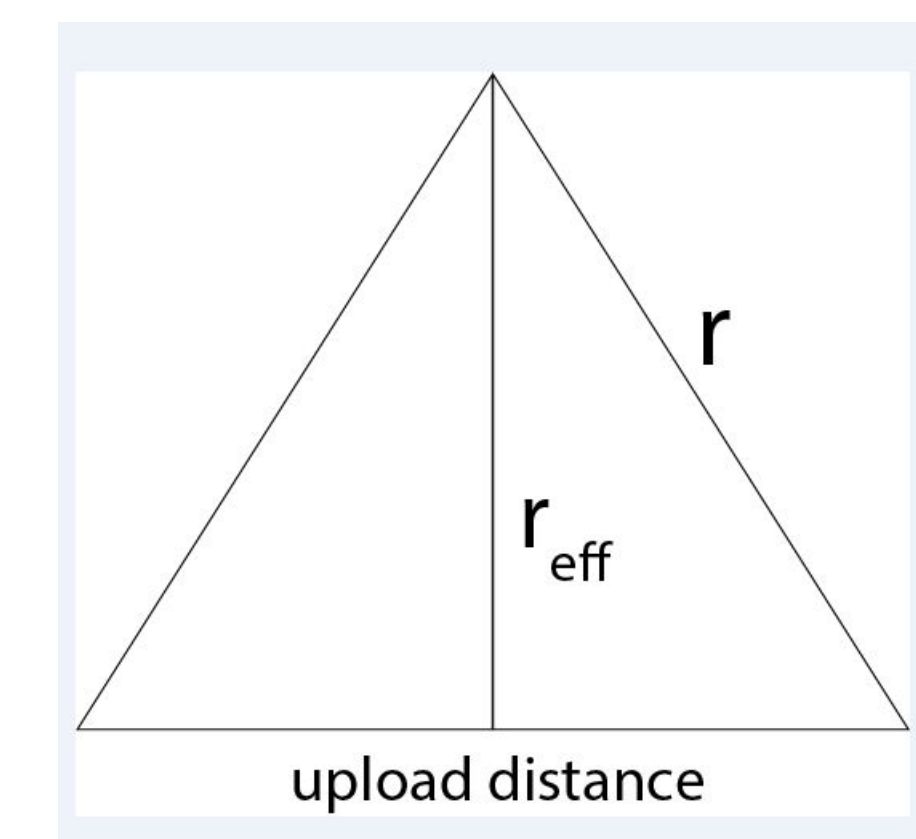
The directional "H" antenna has the better performance than typical handheld 3 element antennas used in the early days of telemetry. The result is better range performance and a more consistent pattern for location work. We will mount the "H" antenna under the VAPOR55.

Effective Range

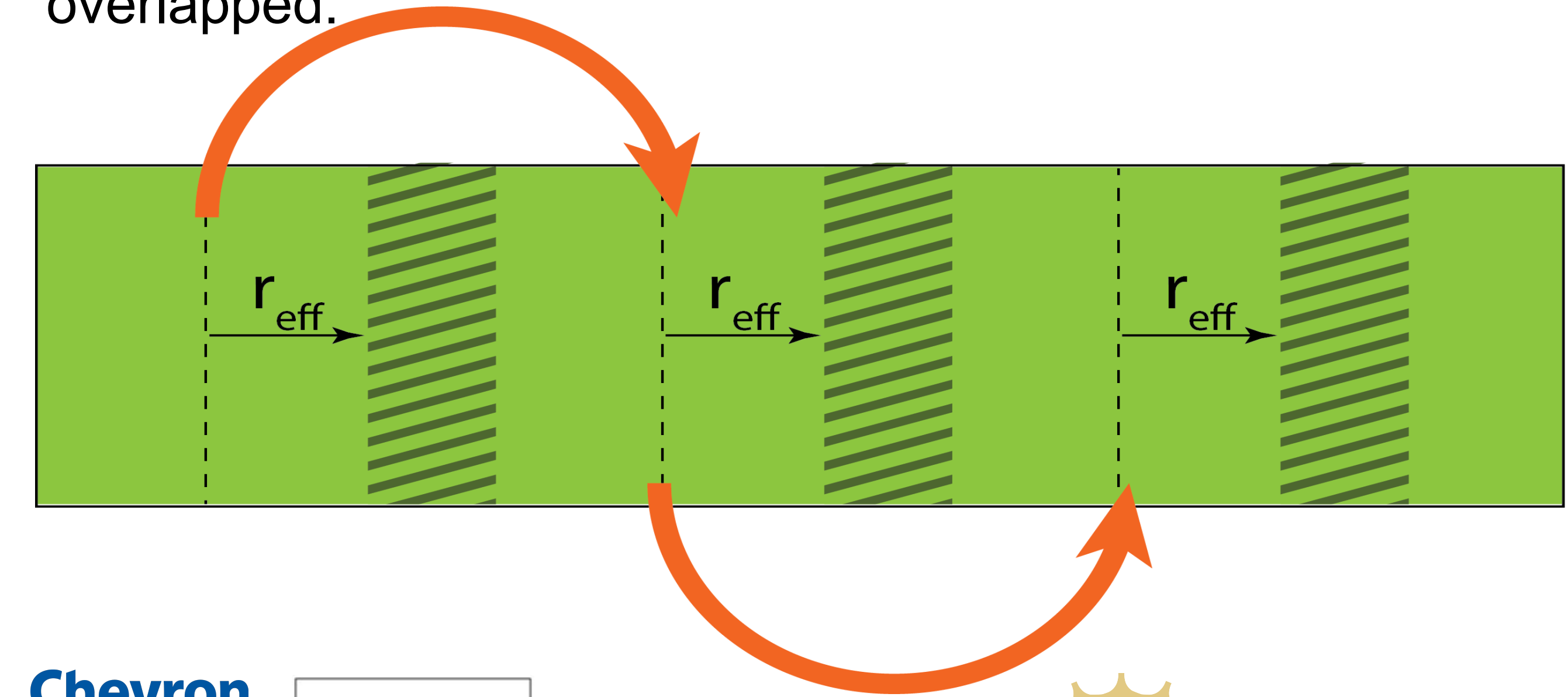
Step 1: The "H" antenna will be placed on VAPOR55. VAPOR 55 will move at 10 m/s



Step 2: Assume it will take 5 seconds to upload the data, so the required minimum distance is 164 feet.



Step 3: On the testing area, 50% of the area will be overlapped.



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