Smart-trapping, live-capture and monitoring of invasive reptiles

Wild Vision Systems

Derek Yorks & Ben Stookey

THANK YOU!

We are so honored to receive this award!

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Who we are

Derek

Ben

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Vision

"Somebody has to do something!"

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An **invasive species** is an introduced organism that becomes overpopulated and harms its new environment.

Although most introduced species are neutral or beneficial with respect to other species, _invasive species adversely affect habitats and bioregions, causing ecological, environmental, and/or economic damage._

Wikipedia

Invasive reptiles pose special challenges

- Difficult to detect
- Persist at low population densities
- Not easily excluded by fences or other barriers

Notable invasive reptiles in the U.S.

- Burmese Python (FL)
- Argentine Black and White Tegu (Southeast)
- Brown Tree Snake (Guam)
- Red-eared Slider
- Other large lizards

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Better tools for bigger jobs

Current Efforts

- Human-powered
- Labor intensive
- Costly
- Challenging in remote areas
- Seasonal limitations

Opportunity

- Possibilities of emerging tech
- Landscape-scale
- Workforce impact multipliers
- Automation
- Real-time data pipeline
- Analytics
- Continuous improvement

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Our Smart-Trap Design

Built on proven methods; harnessing the promise of emerging technology

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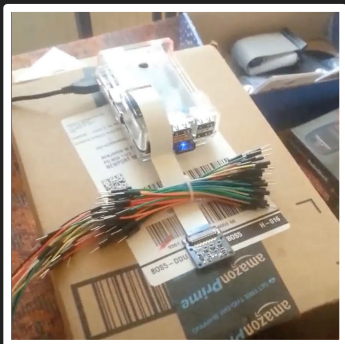# Hybrid Solution

Established & Proven Methods

- Live-capture
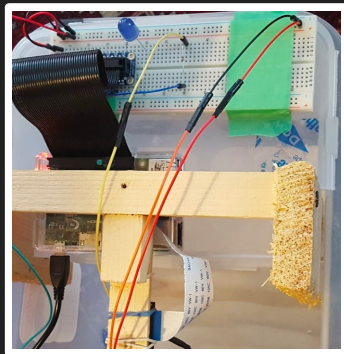- Camera trapping
- Animal Safety

Emerging Technologies

- IoT
- Computer Vision / AI
- Wireless communication
- Data Science & Analytics
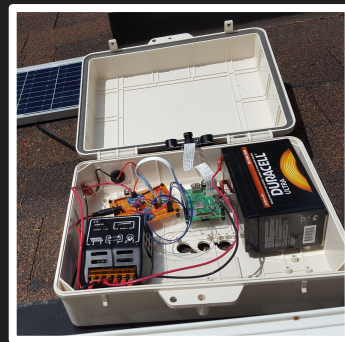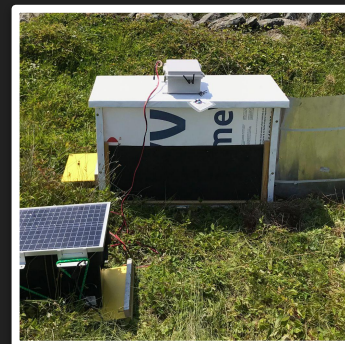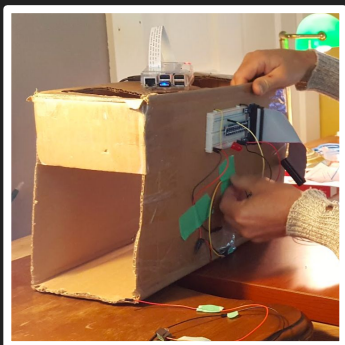- Microcontrollers & Embedded Systems

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Design Evolution

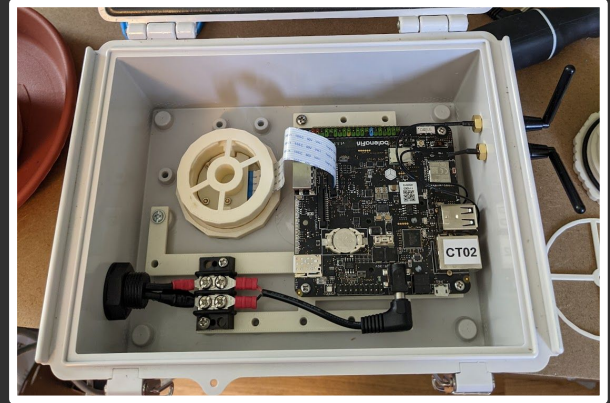# Field Testing
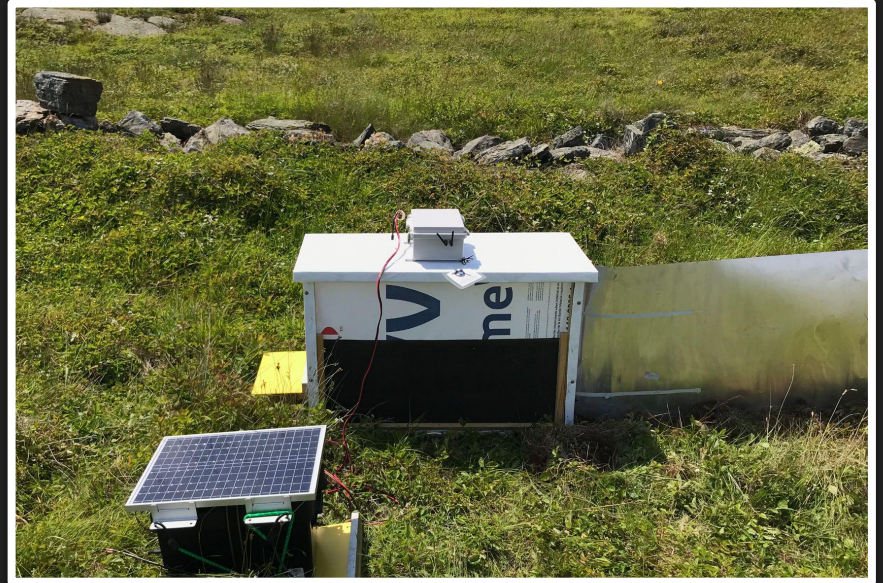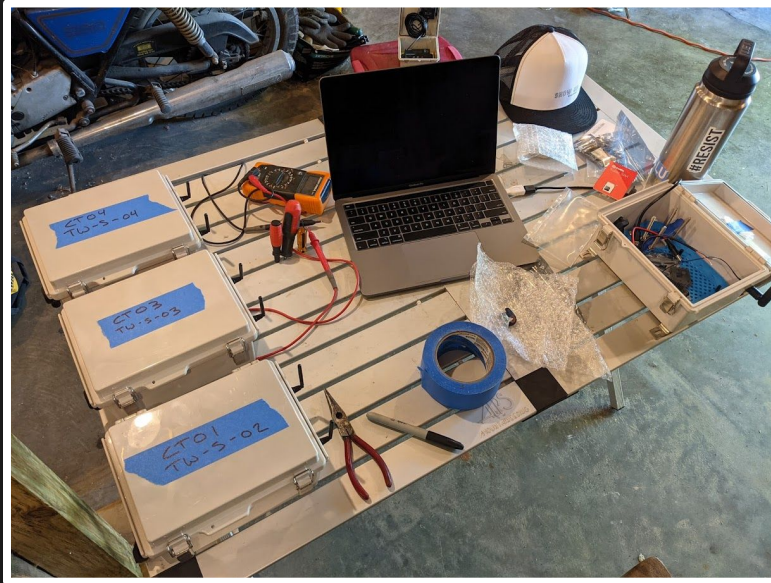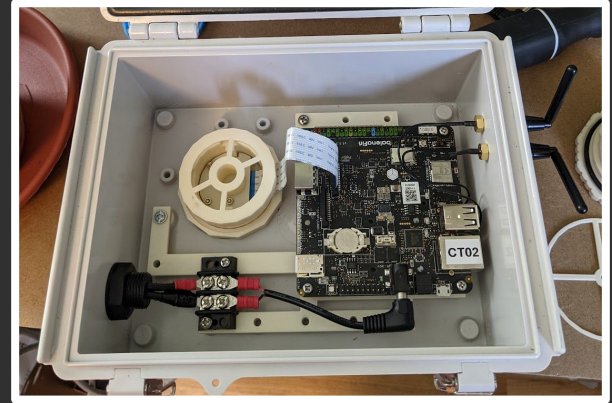
Trap Design

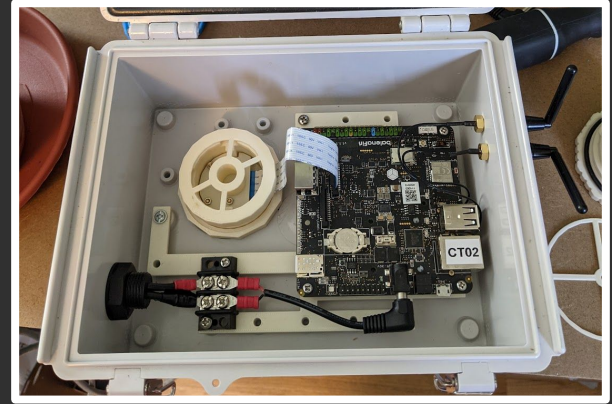## Smart & Deployable

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Smart

- Selective, automatic capture
- Remote connectivity
- Real-time management
- Data collection
- Analytics platform
- Capture *and* monitoring

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Deployable

- Light weight & rugged
- Simple structure
- Low-power for extended use
- Reduces trap checks
- Increases coverage area
- Safe

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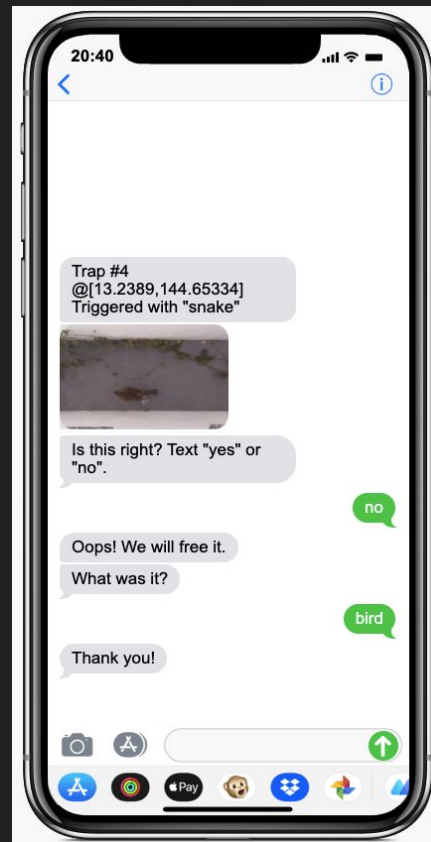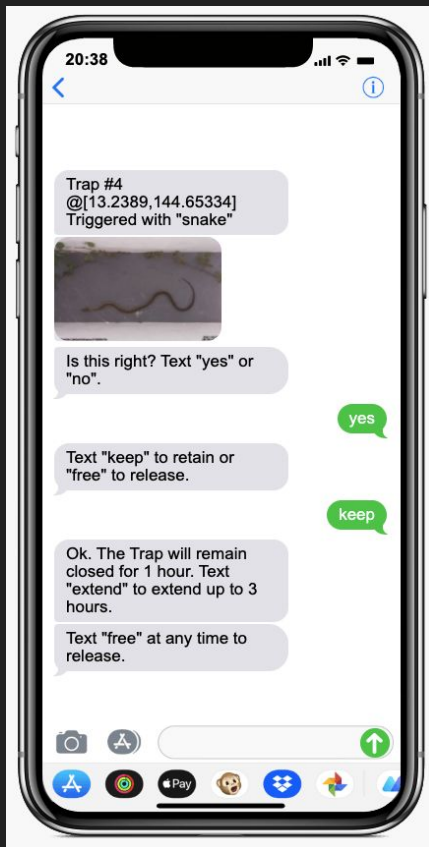
How it works

Target capture

1. Animal enters trap
2. Trap identifies target
3. Doors close
4. Notifications sent w/ image
5. Manager takes action
   - Retrieval or release
6. Re-arm trap

Data collection

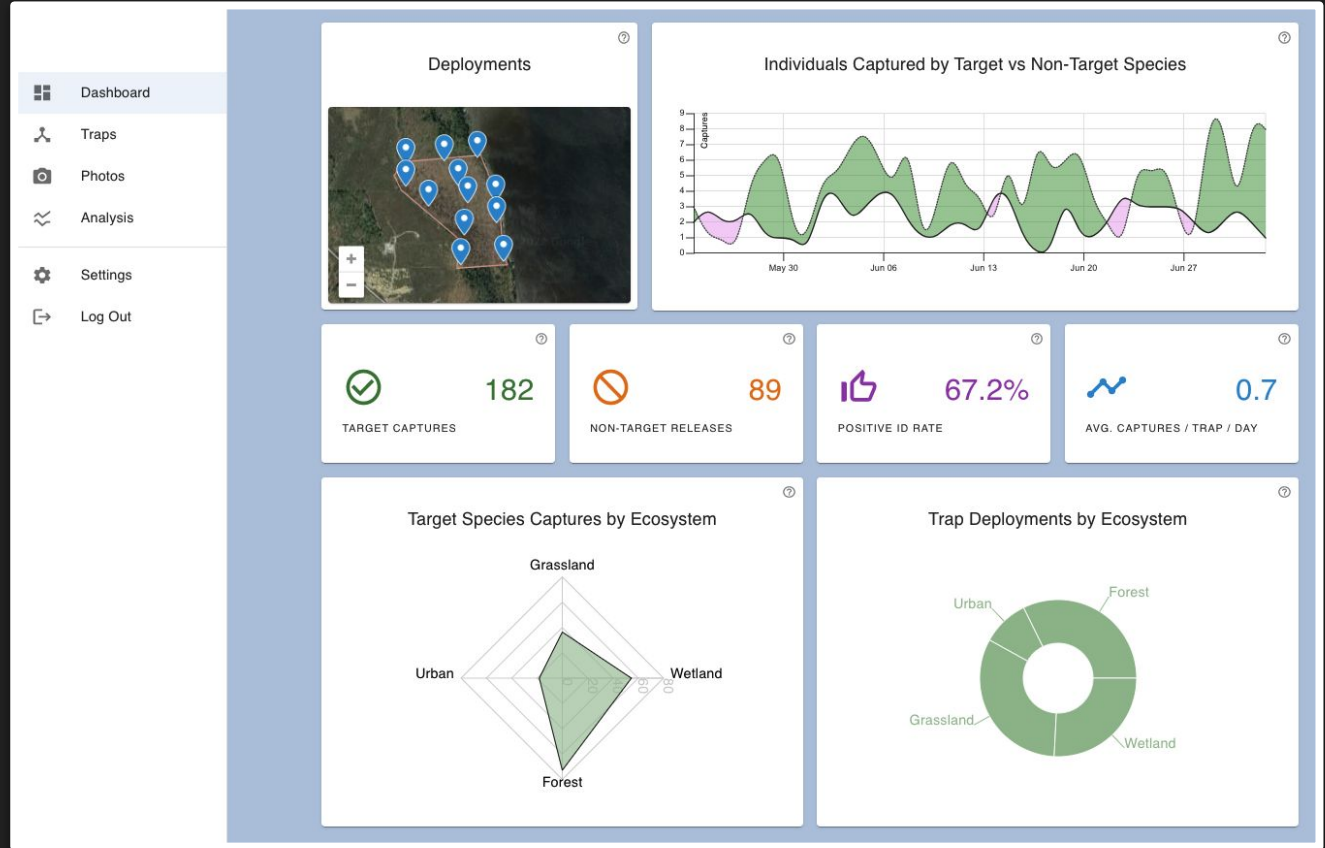- Capture data is used to improve AI model
- Non-target species are not trapped, but reported

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Notifications

Platform

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Potential

So many opportunities to support conservation efforts!

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Potential Applications

Immediate U.S. Needs

- Tegus
- Brown tree snakes
- Burmese pythons
- Green iguanas
- Nile monitor lizards
- Garter snakes on islands
- So many more...!!

Beyond Invasive Reptiles

- Mammals and amphibians
- Safe live-capture
  - Research and monitoring
  - Population evaluation
- Repeating designs
- Aquatic designs
- International efforts

Tegu Example Scenario

Prep

- Modify trap design as needed
- Computer vision model training
- Prepare wireless connection (sat/5g)

Tests with tegus in lab

- Bait/lure and trap design testing
- Safety evaluation

Field test

- Pilot study design and area selection
- Remote comms evaluation
- User experience with platform
- Establish goals for capture
- Evaluate human effort for program

Ideal Deployment Lifecycle

- Impact assessment
- Program optimizations
- Continuous pressure on population
- Long-tail efficacy

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THANK YOU AGAIN!

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