

Drone Services & Capabilities

Biodiversity Research Institute (BRI)

OVERVIEW

BRI's Remote Acoustics & Imagery Lab (RAIL) uses uncrewed aircraft systems (UAS) to collect high-resolution data for wildlife research, environmental monitoring, and applied management. We use FAA Part 107-certified flight operations to deliver science-ready geospatial products with clear documentation and quality checks, for habitat mapping, change detection, and repeatable monitoring.

CURRENT FLEET

- **Freefly Astro:** Heavy payloads and mapping
- **DJI Mavic 3:** Versatile wildlife and landscape surveys
- **DJI Mini 4 Pro:** Compact, lightweight

APPLICATIONS

- **Wildlife Surveys:** Colony censuses, nest mapping, and individual counts using low disturbance survey designs.
- **Habitat & Vegetation:** Mapping, structure metrics, restoration monitoring, and invasive species reconnaissance.
- **Telemetry:** Airborne receiver support for VHF-tagged wildlife and detection-range mapping.
- **Wetland & Freshwater Systems:** Wetland extent and condition surveys, repeat monitoring for change detection.

QUALIFICATIONS

- **Six FAA Part 107-certified remote pilots**
- **Ecological field expertise** in wildlife research, environmental monitoring, habitat assessment, and conservation
- **Specialized UAS experience**, including Motus calibration, offshore vessel-based operations, habitat mapping, and wildlife surveys
- **Mission planning expertise** for airspace review, FAA authorization, site access, and aircraft limitations
- **Science-ready workflows** that connect flight planning, data collection, processing, QA/QC, and documented deliverables

WHY DRONES

1. Centimeter-scale data complementing satellite imagery and ground surveys.
2. Lower disturbance and reduced risk in remote or hazardous locations.
3. Rapid deployment timed to breeding, migration, tides, or storm events.
4. Repeatable monitoring designs that support change detection and long-term records.

SURVEY METHODS

PILOT-DIRECTED FLIGHTS

Manual operations for adaptive wildlife observation, nest approach, or dynamic environmental conditions requiring real-time judgment.

PRE-PROGRAMMED FLIGHTS

Automated flight plans for repeatable grid or transect surveys ensuring consistent overlap, altitude, and coverage for change detection.



PROJECT WORKFLOW

- 1 **Scoping**
Define research question, sensor selection, site constraints, and deliverable formats
- 2 **Flight Planning**
FAA authorization, landowner coordination, and weather window planning
- 3 **Field Operations**
Certified operations with wildlife-sensitive protocols and real-time safety monitoring
- 4 **Processing**
QC-reviewed pipeline converting raw captures to calibrated, georeferenced products
- 5 **Delivery**
Science-ready outputs with processing documentation, metadata, and GIS-ready files

DATA DELIVERABLES

Product	Description
Georeferenced Imagery	Orthomosaics (GeoTIFF) with consistent projection, tiling, and acquisition metadata
3D & Elevation Layers	Point clouds and Digital Surface and Terrain Model (DSM/DTM) outputs
Wildlife Annotation	Reviewed counts or computer-vision-assisted annotation with human QA and summary tables
Habitat Metrics	Structure summaries, change layers from repeat surveys, and plot-aligned index summaries
Processing Report	Full methodology documentation, QC notes, file inventory, and coordinate reference system details

COMPLIANCE & SAFETY

1. All operations conducted by FAA Part 107 certified pilots
2. Landowner and Tribal coordination on all application sites
3. LAANC authorization obtained when required
4. Flights paired with mitigation planning appropriate to operating environment

