FIRETAIL

ENVIRONMENTS

PRECISION DRONE & DIGITAL ECOLOGY SPECIALISTS

CAPACITY AND CAPABILITY

PRECISION DRONE & DIGITAL ECOLOGY SPECIALISTS

FIRETAIL ENVIRONMENTS

PRECISON DRONE SPECIALISTS

ABOUT FIRETAIL ENVIRONMENTS

With a focus on environmental and ecological drone surveys, aerial treatment solutions and digital ecology, Firetail Environments specialises in custom and often difficult projects, drawing on skills and knowledge from environment, agriculture, ecology and reflective science industries to deliver effective outcomes through detailed planning and a deep understanding of technical requirements for project specific outcomes. Firetail uses precision positioning & mapping paired with experienced Digital Ecology methods to deliver projects appropriately and efficiently.

VALUES AND PROCESS

As part of its service provision and project delivery, Firetail Environments aligns with internal values that promote community-led outcomes and delivery at all levels, Firetail strives to create inclusive and culturally sensitive delivery solutions by working to the following values and process framework:

INSPIRE *Lead and encourage others to lead, own and invest in community based projects.*

INCLUDE *Include stakeholders in the process and understand economic, environmental, cultural and social priorities, and include these in delivery outcomes.*

IMPACT *Create social and cultural impact outcomes that provide opportunities to engage with project design and delivery on an on-going basis.*

IMAGINE *Deliver free thinking, conceptual and innovative solutions that align with best practice methods to create best outcomes for environment, agriculture, biodiversity, cultural priorities and local communities*

FIRETAIL ENVIRONMENTS IS A PROUD SUPPORTER OF:

94.9 main FM

INNER SPACE

MT ALEXANDER WOMEN'S SPORTS CLUB FALCONS

KYNETON WOMEN'S FOOTBALL CLUB

Firetail Environments acknowledges the Djaara people, Traditional Owners of Dja Dja Wurrung Country on which we work, and extend our acknowledgement to all Traditional Owner groups throughout Australia.

ALWAYS WAS ALWAYS WILL BE

TREATY FOR VICTORIA

PRECISION DRONE SPECIALISTS | DATA WITH INTEGRITY | ON-GROUND OUTCOMES

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DIGITAL ECOLOGY SOLUTIONS

DIGITAL ECOLOGY

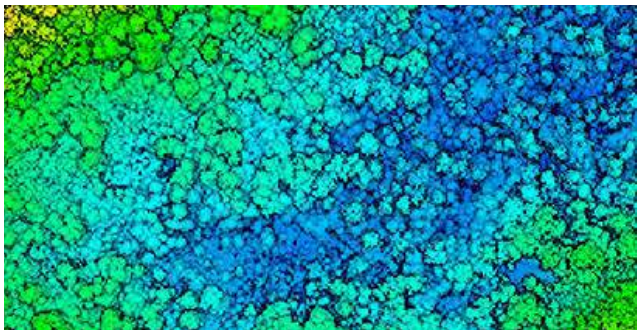
Our digital ecology approach combines environmental science, ecology, and advanced sensing technologies to deliver high-accuracy monitoring and management tools. By integrating UAV mapping, thermal and reflective sensing, and precision application, our solutions convert complex environmental data into actionable strategies, on ground outcomes and assessments.

From ecosystem assessments to weed detection and native seed delivery, digital ecology enables targeted, efficient, and informed management for restoration & conservation, land management, and biodiversity.

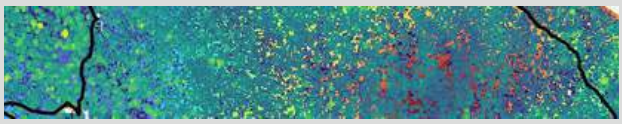
CORE DIGITAL ECOLOGY CAPABILITIES

Our Digital Ecology services integrate advanced remote sensing technologies with ecological expertise to provide a complete picture of landscape condition, change, and management priorities. We combine LiDAR, spectral, and thermal data with experienced ecological analysis and developed methodolgies to deliver accurate, repeatable insights that support biodiversity conservation, restoration planning, and on-ground action.

- ***Remote sensing & spatial ecology***
- ***LiDAR data acquisition & analysis***
- ***Spectral vegetation assessment (multi/hyperspectral, infrared)***
- ***Biodiversity & habitat monitoring***
- ***Weed detection & invasive species mapping***
- ***Carbon stock and biomass estimation***
- ***Stream morphology & hydrology mapping***
- ***Grassland and ecosystem condition assessment***
- ***Precision aerial spraying & seeding***



SNAPSHOT CASE STUDY



Firetail Environments conducted a high-resolution UAV survey and subsequent ecological report over 70ha of managed forest on Djaara Country. Using RGB, LiDAR, and multispectral imaging, we mapped canopy health, biomass, carbon stock, plant stress, watershed, and erosion risk.

The data identified stress zones and opportunities for culturally-led interventions. This informed 14 strategic recommendations aligned with forest management goals, supporting Traditional Owner-led restoration and biodiversity outcomes.

WHY WORK WITH FIRETAIL ENVIRONMENTS

We use precision drone workflows designed to meet the specific needs of each project. Every survey or aerial application is supported by best practice methodologies developed for integrity and repeatability. Our methods combine rigorous planning, high-resolution data capture, and advanced analysis to deliver outputs that inform practical management actions.

- ***Precision drone workflows*** *– GNSS RTK/PPK positioning for maximum survey integrity*
- ***Best practice methodologies*** *– Proven best-practice methods that are agile & adaptable for unique environments and project outcomes*
- ***Proven track record*** *– Delivered for councils, conservation groups, agencies and landscape-scale restoration projects*
- ***Integrated approach*** *– From data collection to actionable plans and on-ground implementation*
- ***Scalable solutions*** *– Supporting projects from site-scale to regional biodiversity monitoring*

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PRECISION DRONE SPECIALISTS | DATA WITH INTEGRITY | ON-GROUND OUTCOMES

FIRETAIL ENVIRONMENTS
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PRECISION LiDAR SURVEYS

We deploy high-resolution LiDAR to map terrain, vegetation structure, and biomass with centimetre accuracy. Outputs support:

- ***Biomass and carbon stock modelling***
- ***Canopy cover and habitat structure analysis***
- ***Stream morphology and surface hydrology modelling***
- ***Ecological condition and landscape change tracking***

LiDAR datasets integrate with plant reflectance, multispectral, hyperspectral, and thermal data to assess ecosystem function and detect changes over time.

PLANT REFLECTANCE

Multispectral, Hyperspectral & Thermal Surveys

We capture plant reflectance and thermal data to detect:

- ***Species and ecological composition shifts***
- ***Vegetation stress, health, and water use***
- ***Seasonal phenology patterns***
- ***Pest plant and invasive species presence***
- ***Animal presence and activity through thermal imaging***
-

These datasets enable biodiversity monitoring and habitat assessment at scales and frequencies beyond traditional ground surveys.

ECOLOGICAL CLASSIFICATION AND DEEP LEARNING DETECTION MODELS

Firetail delivers classification and mapping services using a variety of analytical approaches and datasets, providing a broader ecological perspective for planning, compliance, and biodiversity conservation.

Our **ECO:SENSE deep-learning Vegetation Modelling tool** provides capacity for highly accurate species detection and classification delivering:

- ***Automated weed and plant detection***
- ***Spatial outputs for abundance, distribution, and coverage***
- ***Species-specific models adaptable to seasons and locations***
- ***Data ready for reporting, planning, and ground crew navigation***

BIODIVERSITY, CARBON & ECOSYSTEM FUNCTION MONITORING

We bring a comprehensive and cohesive view to landscape scale management, monitoring and analysis:

- ***Survey & data collection supporting integrated monitoring outcomes***
- ***High resolution condition analysis of forests, grasslands, streams, wetlands***
- ***Habitat connectivity and fragmentation***
- ***Carbon stock and vegetation condition***
- ***Impacts of invasive species***

Our workflows support integrated monitoring programs through the deployment of custom survey solutions.

Data is processed into high resolution outputs that provide detailed ecological condition information.

Findings are reported in clear, actionable formats to track habitat health, ecosystem change, and management outcomes.

SPRAYING & NATIVE SEED SPREADING

Firetail offers aerial application services to complement survey data and management planning, including:

- ***Targeted weed spraying for invasive plant control***
- ***Direct broadcast seeding of native material using internally developed solutions specific to native seed spreading***
- ***Custom seed-ball manufacture and aerial distribution***
- ***Precision mapping to target bare earth, post-burn areas, or restoration zones***

These services ensure survey findings translate into immediate, targeted on-ground action.

For more information about Firetail Environments contact Dan Pettingill on 0492 823 191

IDENTIFY . CLASSIFY . DETECT . MANAGE

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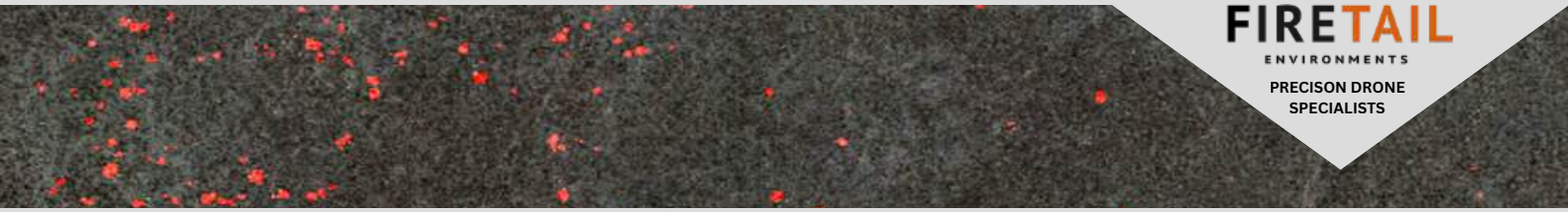

ECO:SENSE *VEGETATION INSIGHTS TOOL*

ABOUT ECO:SENSE

ECO:SENSE is a GIS-based classification and detection tool that transforms UAV survey data into high-resolution, actionable insights that can assist in the digital ecology workflow. It streamlines vegetation monitoring by automating species detection and generating spatial metrics such as abundance, distribution, and average plant size.

By increasing survey efficiencies with precision-based accuracy, ECO:SENSE supports better decision-making, targeted reporting, and more efficient use of resources, allowing land managers to focus on priority areas and put more boots on the ground where they are most needed.

CREATED BY LAND MANAGERS, FOR LAND MANAGERS

Made by land managers, for land managers; ECO:SENSE assists land managers to identify, annotate, train, and predict the presence of target species at a landscape scale. It provides a complete pipeline for creating custom species models and applying deep learning to produce high resolution data metrics with integrity. Users can use the tool themselves, or engage Firetail to undertake end to end project works on their behalf.

- **Collect UAV Imagery**
- **Identify your target species**
- **Train and Develop Model**
- **Run Predictions**
- **Extract Results**
  - Count individual plants
  - Output GPS locations
  - Calculate covered area and average plant size
  - Spatialise abundance and distribution across landscapes
- **Report Findings**

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FIRETAIL ECO:SENSE PLANT ID TOOL

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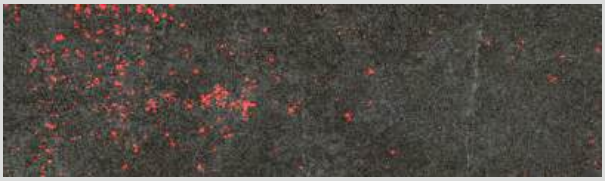
OUTCOME DRIVEN DATA WITH INTEGRITY

The ECO:SENSE classification tool is designed to turn high-resolution drone imagery into actionable insights. It streamlines large-scale vegetation and weed monitoring, helping land managers identify, quantify, and respond to situations efficiently.
Our ECO:SENSE tool assists land managers to:

- **Automate weed and plant detection and classification** across large landscapes
- **Produce detailed maps for rapid identification and analysis**.
- **Reduce manual survey efforts, increase accuracy in data metrics**, provide greater decision-making assistance and allow more resources to flow into ground works with greater efficiency
- **Support vegetation management decisions** with spatial outputs and metrics in abundance, distribution and surface cover
- Enable researchers, ecologists, and land managers to **build, refine, and deploy trained models** tailored to specific species and environments
- **Provide accurate data for reporting and assessment** of metrics such as attrition, treatment efficacy and progression over time

SNAPSHOT CASE STUDY



ECO:SENSE has been deployed to detect Artichoke Thistle across 400 ha of mixed-use land being managed for restoration as part of Victoria's Western Grassland Reserve project.

High-resolution drone imagery (1 cm GSD) was processed to map infestations, identifying weed burden with 90% accuracy.

The outputs informed targeted control measures, cutting survey time by 60% and improving response speed for on-ground crews.

BENEFITS OF ECO:SENSE

ECO:SENSE transforms aerial imagery into powerful spatial insights that help land managers make informed decisions and take targeted action. By automating the detection and mapping of weed species or vegetation targets, the tool provides high-resolution data that is ready for reporting, planning, or treatment.

Built for real-world applications, ECO:SENSE simplifies complex workflows—users can quickly generate annotated maps, spatial files, and distribution reports that guide field crews and resource allocation. Whether it's invasive weed control, native planting, or restoration monitoring, the tool supports fast, repeatable, and data-driven management.

With flexible deployment, precision accuracy, and a high level of data integrity **ECO:SENSE empowers** land managers with the clarity and precision needed to manage large or complex landscapes with confidence.

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PHOTOGRAMMETRY AND MAPPING

ABOUT PHOTOGRAMMETRY SURVEYS

Photogrammetry is the foundational science of creating precise, measurable maps and 3D models from aerial imagery used by Firetail. By capturing overlapping photographs with drones, we generate detailed digital representations of terrain, vegetation, and infrastructure.

High resolution surveys, models and associated data allow for accurate measurement, analysis, and monitoring at a scale and resolution impossible with traditional survey methods.

At Firetail Environments, we use photogrammetry to provide actionable insights for environmental management, landscape scale planning, and ecological monitoring that delivers highly accurate data that is repeatable, and ready for integration into GIS and asset management systems.

OUR APPROACH

Firetail Environments deploys advanced photogrammetry methods to deliver high-resolution insights into vegetation condition, forest and landscape health, and ecosystem processes across diverse landscapes, delivering repeatable high resolution outputs and detailed insights including:

- ***Integrated Drone and GIS Workflows combining UAV technology with advanced GIS management to create accurate 2D and 3D models of terrain, vegetation, and infrastructure. This integrated workflow enables detailed analysis of ecological conditions, landforms, and human-made features.***

- ***Tailored survey design and methodologies that align with client objectives and environmental sensitivities, optimizing flight paths, sensor selection, and data capture techniques to achieve the highest-quality results.***

- ***Repeatable, scalable solutions, our deployment outcomes are designed for repeatable data capture. Whether monitoring forest regrowth, wetland health, or construction progress, our solutions allow for consistent data comparison over time.***

As part of our established best-practice methods, Firetail combines precision positioning and calibrated, repeatable survey protocols to ensure data integrity over time.

This approach supports data and survey integrity, and provides robust comparison data across time, progress change or season. The depth of the data collected provides significant insight, both short and long term, into project outcomes and environmental changes.

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PRECISION PHOTOGRAMMETRY & MAPPING SURVEYS

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CORE SERVICES

Our photogrammetry and mapping capabilities cover a wide range of applications, delivering precise spatial data tailored to your project needs. From detailed aerial imagery to 3D models, our services provide the insights required for informed environmental, cultural, and infrastructure decision-making.

- **Orthomosaic Mapping –** High-resolution, georeferenced aerial imagery for precise spatial analysis.
- **3D Terrain and Vegetation Models –** Detailed digital elevation models (DEMs) and canopy height models for ecological and engineering applications.
- **Topographic and Contour Mapping –** Accurate elevation mapping for planning, design, and environmental assessment.
- **Landcover & Vegetation Classification –** Mapping data processed for habitat mapping, biomass estimation, and ecological monitoring.
- **Change Detection & Monitoring –** Track landscape changes, erosion, or vegetation shifts across multiple survey periods.

WHY FIRETAIL ENVIRONMENTS

Our UAV-based mapping services are designed to deliver precision, efficiency, and informed insights. We integrate ecological knowledge, project-led objectives, and advanced GIS workflows into every project, ensuring the spatial data collected is not only accurate, but also practical, actionable, and aligned with specific project management goals.

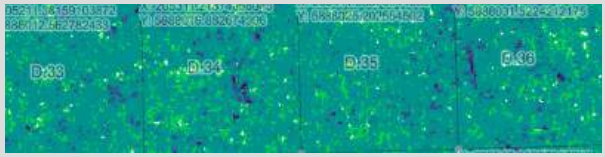
Accuracy and Reliability - Our methodologies provide centimeter-level accuracy, capturing details traditional survey methods can miss and opening landscape-scale management observations.

Cultural & Ecological Sensitivity - We embed local ecological knowledge and community-led objectives into our survey design, ensuring outcomes respect environmental and cultural values and support Traditional Owner-led management techniques through data collection and research.

Integrated Insights - Mapping data is processed and delivered in formats compatible with GIS and asset management systems, providing actionable intelligence for decision-making and reporting.

Efficiency & Safety - Aerial-based mapping opens up opportunity to access areas traditional surveys cannot, improving safety, efficiency, and overall project management outcomes.

SNAPSHOT CASE STUDY



Firetail Environments was engaged to survey two extensive forested properties in the NSW Northern Rivers region, covering approximately 900 hectares of dense temperate rainforest.
The surveys provided high-resolution data supporting ecological analysis and management planning, including:

- Assessing Lantana distribution to guide long-term invasive species management.
- Developing a community fire plan.
- Identifying opportunities to enhance koala habitat and connectivity.
- Surveying and mapping endangered Onion Cedar stands.
- Detecting invasive species, including Lantana and Cat's Claw Creeper.

The project delivered insights previously impossible at this scale, enabling evidence-based planning to protect biodiversity, manage invasive species, and enhance habitat connectivity.

For more information about Firetail Environments contact Dan Pettingill on 0492 823 191

PRECISION MULTISPECTRAL SURVEYS

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PLANT HEALTH AND REFLECTANCE ANALYSIS

ABOUT MULTISPECTRAL SURVEYS

An important part of our Digital Ecology approach, multispectral surveys capture high-resolution imagery across multiple wavelengths to assess vegetation health, species composition, and ecosystem condition. Combined with ecological expertise and spatial analysis, this data is transformed into actionable insights for land management and restoration.

By revealing vegetation stress, canopy health patterns, and ecosystem dynamics, multispectral surveys support targeted, repeatable, and efficient interventions. Integrated within our Digital Ecology framework, these surveys enable data-driven management, monitoring, and conservation outcomes across complex landscapes.

PLANT REFLECTANCE SURVEYS

Firetail Environments deploys advanced multispectral and hyperspectral analysis to deliver high-resolution insights into vegetation condition, forest and lanscape health, and ecosystem processes across diverse landscapes that deliver high resolution outputs and detailed insights including:

- ***Vegetation stress, water use, and nutrient status across forests, grasslands, and riparian areas.***
- ***Differentiation of species and functional groups using spectral signatures for targeted ecological management.***
- ***Assessments of canopy health, biomass, ecosystem condition and carbon stock to inform sustainable forest and land management.***
- ***Map erosion risk, soil condition, and hydrological function to support restoration and resilience planning.***
- ***Track grassland, aquatic, and forest health, providing actionable insights at landscape scale for long-term monitoring and strategic outcomes.***

As part of our established best-practice methods, Firetail combines precision positioning, calibrated reflectance workflows, and repeatable survey protocols to ensure data integrity across time intervals.

This approach enables detailed temporal analyses, supports adaptive management, and allows multiple survey intervals to be reliably compared, ensuring the accuracy, reproducibility, and practical applicability of multispectral and hyperspectral outputs across projects.

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PRECISION MULTISPECTRAL SURVEYS

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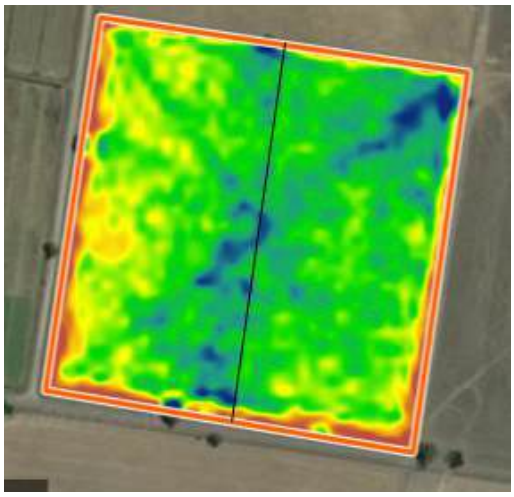


OUTCOMES AND APPLICATIONS

Multispectral and plant reflectance analysis is increasingly used as part of broader environmental monitoring methodologies, offering high-resolution insights that guide restoration and land management.

These surveys are commonly integrated with LiDAR, orthomosaic mapping, and thermal monitoring to provide:

- ***Forest health and condition assessments***
- ***Biomass and carbon stock estimation***
- ***Canopy cover and vegetation structure monitoring***
- ***Detection of tree mortality, decline, or stress***
- ***Invasive species and pest plant mapping***
- ***Grassland, wetland, and stream ecosystem monitoring***

By delivering spatially rich and repeatable datasets, multispectral surveys help land managers, decision-makers and researchers monitor biodiversity change, assess management outcomes, and support ecological restoration. As part of an integrated approach, outputs can inform biodiversity and carbon accounting methodologies and reporting processes by providing consistent measurements of vegetation dynamics over time.

WHY FIRETAIL ENVIRONMENTS

Firetail Environments applies expertise in reflective sciences, land management, and ecology to deliver precision drone workflows tailored to each project.

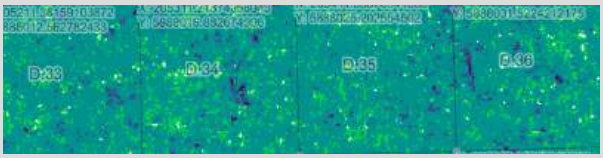
Surveys follow robust methodologies to ensure relevance, compliance VMR requirements, and on-ground value.

Our Digital Ecology tools work together: photogrammetry producing high resolution orthomosaics for accurate mapping and visual change detection; LiDAR supports biomass and habitat models; multispectral surveys identify vegetation characteristics; our ECO:SENSE tool classifies target species; and thermal monitoring provides insight into fauna, flora, and pest activity.

These layers integrate with one another to provide detailed and highly valuable landscape insights and monitoring into tangible restoration outcomes.

- ***Precision drone workflows – Precision positioning for survey integrity***
- ***Reflectance calibration – Accuracy and replicability across intervals***
- ***Developed methodologies – Methods and outputs with integrity***
- ***Ecological alignment – Supporting restoration and management goals***
- ***Proven track record – Delivered for councils, agencies, & large projects***

SNAPSHOT CASE STUDY



Firetail deployed multispectral surveys alongside LiDAR across 80ha of dry Eucalypt and Box-Ironbark forest on Djaara Country.

NDRE, OSAVI, and VARI indices mapped canopy and ground layer condition, identifying areas of sparse, moderate, and healthy vegetation.

Results provided insight into higher elevations exhibiting more degraded and stressed canopy, while lower zones showed taller, older and healthier vigorous growth aided by water flow and previous interventions.

Detailed, experienced analysis informed targeted management interventions inc. understory rehabilitation & targeted tree management, improving strategic goals & supporting effective on-ground forest restoration.

For more information about Firetail Environments contact Dan Pettingill on 0492 823 191

PRECISION LiDAR SURVEYS

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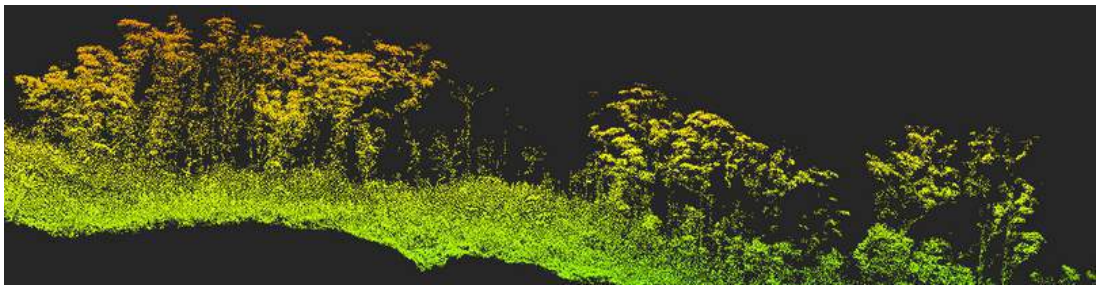
PRECISON DRONE SPECIALISTS

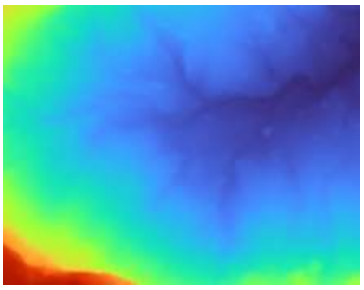
CARBON MANAGEMENT AND MONITORING

ABOUT FIRETAIL ENVIRONMENTS

Firetail Environments uses LiDAR to deliver high-precision mapping and monitoring of vegetation structure, biomass, and carbon stock. By capturing detailed three-dimensional data, LiDAR enables accurate assessment of forest condition, vegetation density, ecological baselines and ecosystem health.

Integrated into our digital ecology approach, these insights support targeted vegetation management, carbon accounting, restoration planning, and biodiversity conservation. LiDAR-derived metrics provide repeatable, reliable data that informs efficient, data-driven land management and restoration strategies.





DRONES IN CARBON MANAGEMENT

Drones have become common in forestry, carbon and forest condition monitoring and reporting projects as technology and skills become more readily available.

Firetail provides specialist solutions for carbon estimation including:

- ***Workflow design & delivery for project development and accurate positioning & survey procedures***
- ***Precision accuracy modelling and analysis***
- ***Baseline survey requirements***
- ***orthomosaic mapping***
- ***LiDAR assessments inc. biomass, surface hydrology etc.***
- ***Plant reflectance and multispectral/hyper spectral surveys***
- ***Appropriate analysis, reporting and liaising with independent auditing requirements as required***

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CARBON MANAGEMENT AND MONITORING

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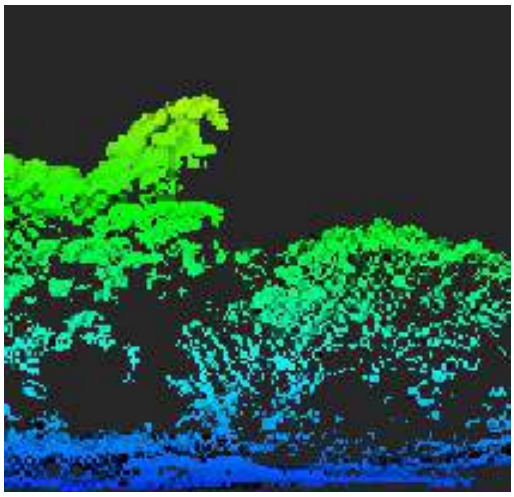

VEGETATION BASED PROJECT METHODS

Firetail provides robust, repeatable survey methods that are designed and deployed specific to project requirements (including orthomosaic, LiDAR and multispectral remote sensing technologies) these methods include best practice deployment and are typically used as part of broader approved methodologies for carbon project assessments that align with approved and adopted methodologies and other relevant CFI or independent carbon accounting methods and analysis including:

- **forest carbon and biomass estimation**
- **canopy cover and forest health assessments**
- **tree or plant attrition**
- **vegetation and invasive (pest plant and animal) species monitoring**

An efficient drone program can be adopted and integrated into existing practices for forest health assessments and improved forest management. These methods may rely on LiDAR (Light Detection and Ranging) and multispectral survey data to estimate carbon stock, monitor health and growth of vegetation, assess overall forest condition, as well as periodic thermal monitoring of fauna use or activity and pest vertebrate management.

Firetail uses a structured conceptual method outlined below to integrate drone technology within woody carbon project assessments:

- ***Set project scope and measurement parameters***
- ***Plan survey within measurement requirements***
- ***Collect data (LiDAR, RGB, multispectral)***
- ***Process data inc. point clouds, plant reflectance, condition, canopy, biomass etc. and measure parameters inside of scope***
- ***Report findings on carbon stock, condition and project changes***
- ***Provide comparisons as required against base line data and preceding surveys***
- ***Provide support or organisation for independent auditing as***
- ***As required, conduct periodic pest animal thermal assessments (usually seasonal) for increased management efficiency***

GENERAL METHOD AND ACCOUNTING CONSIDERATIONS:

For a carbon project relying on drone surveys, Firetail works to the following guidelines when developing a methodology for CFI based projects or other carbon accounting programs (internal accounting, Climate Active etc.):

- Develop and provide appropriate project design, base line measurements and setup processes
- Ensure adequate data and positional accuracy to provide survey integrity
- Standardise survey collection for repeatability and appropriate data analysis
- Ensure appropriate survey resolution for accurate and appropriate collection to meet CER (or equivalent) standards
- Provide compliant analysis and monitoring, verification and reporting (MVR)
- Deliver information appropriate for independent auditing where required

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PRECISION LiDAR SURVEYS

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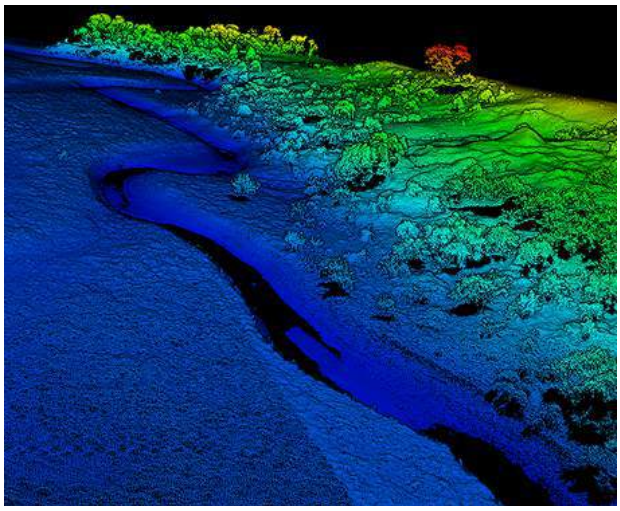
ASSET AND INSPECTION MODELLING



ABOUT LiDAR

LiDAR is a remote sensing method that assists in creating high detail models and providing detailed metrics by recording the reflected pulses of a laser-based sensor. When deployed by drone, it produces highly accurate three-dimensional models of terrain, infrastructure, vegetation, and built assets.

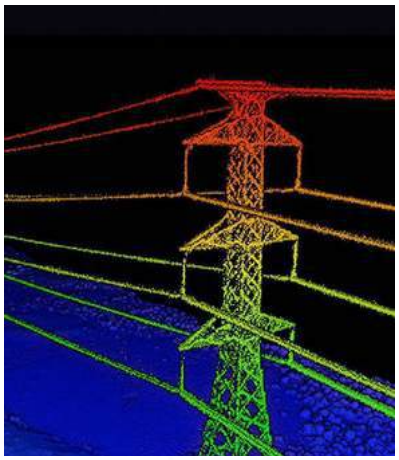
This level of precision makes LiDAR an invaluable tool for inspection, planning, and monitoring projects, capturing spatial data that is repeatable and delivers comprehensive insights for asset and environmental management.

DRONES IN LiDAR & ASSET MANAGEMENT

Firetail Environments applies advanced drone and LiDAR workflows to deliver precise 3D mapping and asset inspection at scale. By capturing high-density spatial data, LiDAR enables accurate measurement of infrastructure, vegetation, and terrain in ways that traditional surveys cannot. This approach reduces time on the ground, improves safety outcomes, and provides a digital record for ongoing management.

Our UAV-based LiDAR programs are designed to integrate seamlessly with asset management and inspection frameworks, delivering efficient data capture and actionable insights across industrial, environmental, and infrastructure sectors.
Key advantages of LiDAR include:

- **High-resolution 3D modelling for complex sites**
- **Rapid, safe data collection over large areas**
- **Repeatable datasets for monitoring change over time**
- **Integration with RGB and multispectral imaging for richer analysis**



ASSET AND INSPECTION

FIRETAIL ENVIRONMENTS
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TECHNICALLY REPEATABLE METHODS

Firetail Environments applies structured LiDAR workflows that deliver consistent, verifiable results across projects. Each survey is designed around clear measurement parameters, ensuring data quality, positional accuracy, and repeatability for long-term use.
Our methods include:

- Standardised flight planning, altitude, and sensor settings for survey integrity
- Calibrated LiDAR and imaging workflows to maintain accuracy across campaigns
- Documented collection and processing protocols for independent verification
- Integration of LiDAR, RGB and multispectral data for multi-layer assessments
- Outputs aligned with engineering, compliance, and audit requirements

By building repeatability into every stage, Firetail ensures confidence in the data and reliability in reporting, supporting both immediate inspection needs and ongoing monitoring programs.

CUT / FILL REPORT

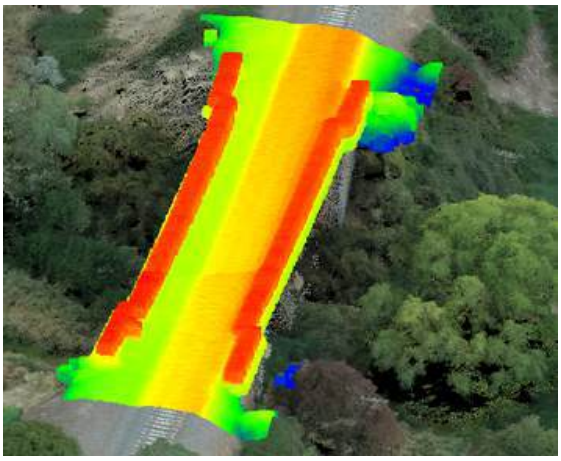
FIRETAIL

Name	Base Plane	Cut Volume	Fill Volume
1 A01	Lowest Point	70.62m³	0m³
2 A02	Lowest Point	29.99m³	0m³
3 A03	Lowest Point	101.6m³	0m³
4 A04	Lowest Point	108.86m³	0m³
5 A05	Lowest Point	180.5m³	0m³
6 A06	Lowest Point	121.49m³	0m³
7 A07	Lowest Point	497.26m³	0m³
8 A08	Lowest Point	334.68m³	0.04m³
9 SLIP01	Mean Plane	984.52m³	155.2m³

PROJECT OUTCOMES AND APPLICATIONS

LiDAR-based inspections provide precise, spatially accurate insights that extend far beyond conventional survey methods. The results deliver practical benefits for asset managers, engineers, and planners by reducing costs, improving safety, and enabling proactive management.
Applications include:

- Detailed 3D asset and infrastructure modelling
- Vegetation clearance and encroachment analysis
- Structural monitoring and change detection over time
- Surface and terrain modelling for planning and design
- Condition reporting to guide targeted maintenance



Key outcomes include efficient inspections without site disruption, repeatable datasets for temporal analysis, and clear reporting outputs that streamline decision-making. Firetail's approach transforms raw survey data into actionable information that supports both immediate operational needs and long-term asset management strategies.

For more information about Firetail Environments contact Dan Pettingill on 0492 823 191

PRECISION SEEDING CUSTOM SOLUTIONS

FIRETAIL ENVIRONMENTS
PRECISON DRONE SPECIALISTS

NATIVE SEED BROADCASTING AND DISTRIBUTION

ABOUT OUR SEEDING AND SPREADING

Our internally developed seed delivery provides precision restoration methods delivering native seed to target areas using UAV technology. Firetail combines ecological expertise with advanced delivery techniques —direct broadcast, pelletised seed, and custom seed balls—to ensure consistent, reliable application and seed disbursement.

By integrating precision mapping, flight planning, and tailored seed delivery, this approach increases efficiency, reduces manual effort, and targets priority areas such as bare earth, post-burn zones, or ecologically significant sites. Drone seeding provides a scalable, repeatable, and cost-effective solution for native vegetation restoration and landscape-scale conservation.

NATIVE SEED APPROACH

With extensive experience and training in conservation and ecosystem management, Firetail brings a unique approach to delivering native seed to target areas. At times, this can include advising and managing end-to-end processes that encompass ecological fire, herbicide treatments, vegetation surveys and, ultimately, providing the most appropriate seed delivery solution for the project. These delivery methods include:

- ***Direct broadcast seeding of cleaned native material***
- ***Mixed seed delivery with a medium to suspend native seed material***
- ***Manufacture and broadcast of native seed material inside of mixed “seed ball” or “clay ball”***

Firetail Environments acknowledges the Djaara people, Traditional Owners of Dja Dja Wurrung Country on which we work, and extend our acknowledgement to all Traditional Owner groups throughout Australia.

NATIVE SEEDING SOLUTIONS

FIRETAIL ENVIRONMENTS
PRECISON DRONE SPECIALISTS

SEED AND DELIVERY PREPARATION

Our unique experience has led Firetail to developing and adopting our delivery methods after observing issues and specific requirements depending on the seed mixes required to be delivered.

Using neutral pellets as a medium for larger seed allows us to deliver low rates of seed successfully and consistently by mixing seed material with a custom pellet made with neutral materials. We aim to use native timber sawdust or by-product where it can be sourced.

Our custom manufactured seed ball technique provides a novel and consistent delivery method for fine seeds and particularly native grass projects. This method allows us to give a density to the seed while providing a consistent delivery. It also provides a seed package around any native seed material to improve seed-to-soil contact and keep the material on the ground until a rain event occurs or conditions are right for germination.

DELIVERY METHOD

Firetail uses precision mapping and positioning to accurately and effectively deliver seed material to target areas. This can include creating custom mapping to determine areas that meet requirements to identify and deliver material to specific areas such as bare earth, ecological burning or other areas determined by project scope. This allows Firetail to create specific delivery plans that provide the most efficient flight route and efficient on-ground delivery.

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PRECISION SPRAYING SOLUTIONS

FIRETAIL ENVIRONMENTS
PRECISON DRONE SPECIALISTS

AERIAL SPRAYING

ABOUT OUR SPRAYING APPROACH

Aerial spraying provides accurate vegetation management treatments that combine ecological expertise with UAV technology to apply herbicides, soil amendments, or other treatments efficiently. By targeting specific areas, it reduces chemical use, improves coverage accuracy, and minimises manual application risks.

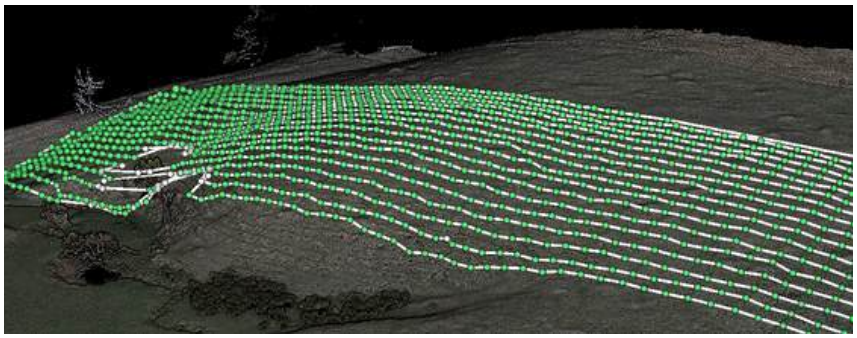
Firetail uses advanced aerial spraying techniques including targeted herbicide application, and integrated ecological knowledge and monitoring approaches. Supported by precision mapping, flight planning, and our internally developed ECO:SENSE tool, our approach ensures accurate treatment of weeds, invasive species, or areas requiring restoration.

OUR APPROACH TO TREATMENT

With extensive experience in conservation and ecosystem management, Firetail brings a tailored approach to aerial spraying. This includes advising and managing end-to-end processes encompassing ecological surveys, targeted herbicide selection, monitoring and assessment, and coordinated treatment schedules to ensure optimal application.
Spray delivery methods include:

- ***Targeted herbicide application to priority weed infestations***
- ***Broadscale dispersal of soil amendments for treatment and restoration projects***
- ***Integrated application and ecological monitoring to reduce impacts on native vegetation***

Integrating ecological knowledge with UAV technology, aerial spraying provides a scalable, repeatable, and cost-effective solution to on ground management activities, supporting conservation, restoration, and land management outcomes safely and efficiently.



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PRECISION SPRAYING SOLUTIONS

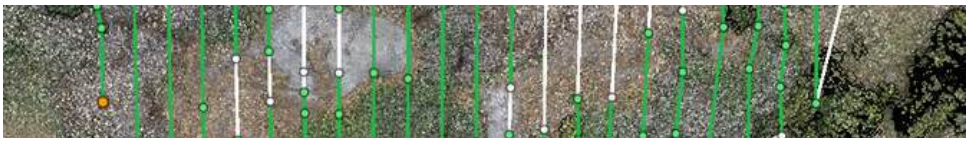
FIRETAIL ENVIRONMENTS
PRECISON DRONE SPECIALISTS

PLANNING, INTEGRATION AND MONITORING

Firetail designs aerial spraying campaigns using ecological data, priority mapping, and seasonal timing to maximise effectiveness while minimising impacts on native vegetation and non-target species. Operations are integrated with ecological surveys to ensure treatments align with conservation and restoration objectives.

This approach enables adaptive management through post-application monitoring, supporting targeted follow-up treatments, evaluation of efficacy, and improvements to future spray plans. By combining data-driven planning, ecological integration, and ongoing monitoring, aerial spraying operations are efficient, scalable, and ecologically responsible, ensuring better decision-making and alignment with landscape-scale management goals with key benefits including:

- ***Maximised treatment effectiveness through precision planning***
- ***Reduced impacts on native vegetation and wildlife***
- ***Alignment with conservation and restoration objectives***
- ***Adaptive management based on post-application monitoring***
- ***Targeted follow-up treatments and improved operational decisions***
- ***Efficient, repeatable, and ecologically responsible operations***



DELIVERY METHOD

Precision mapping and UAV flight planning allow Firetail to deliver treatments accurately and efficiently.

Custom mapping identifies target areas, such as weed infestations, post-fire recovery zones, or areas requiring soil amendment.

Flight routes and delivery plans are optimised to reduce overlap, ensure complete coverage, and prioritise areas of greatest ecological need, enabling effective, scalable, and repeatable aerial spraying operations.

Treatment plans are integrated into overall operational plans and can be instantly paired with our seeding and digital ecology solutions.

SNAPSHOT CASE STUDY

Firetail was engaged to map and treat steep, inaccessible slopes, targeting a significant, untreated blackberry and gorse infestation inaccessible to traditional treatment methods.

High-resolution mapping enabled precise, efficient delivery, reducing manual effort and improving safety and risk outcomes, while also treating the problem more efficiently and in less time than other methods.

Follow-up surveys and treatments have shown successful knockback of most weeds, with minor regrowth in dense areas, highlighting the effectiveness of drone-based treatment for challenging terrain.

For more information about Firetail Environments contact Dan Pettingill on 0492 823 191

PRECISION THERMAL SURVEYS

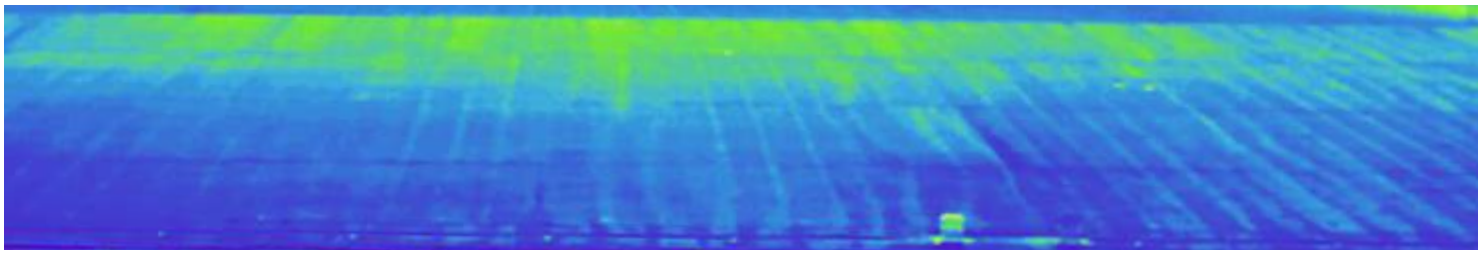
FIRETAIL ENVIRONMENTS
PRECISON DRONE SPECIALISTS

THERMAL INSPECTION & ANALYSIS

ABOUT THERMAL SURVEYS

Thermal imaging is a remote sensing method that measures heat signatures and detects temperature anomalies across built infrastructure.

When deployed by drone, it provides rapid, high-resolution assessments that reveal issues not visible to standard inspection methods. This level of insight makes thermal inspections invaluable for detecting faults, energy loss, and risks in assets such as buildings, utilities, and solar arrays. By delivering precise, repeatable data, Firetail's thermal workflows support safer, more efficient asset management and maintenance planning.



DRONES IN THERMAL INSPECTION & ANALYSIS

Drones are increasingly being deployed in infrastructure and asset monitoring, providing a safe and efficient method to collect high-resolution thermal and visual data on a complete project scale. This technology is particularly effective for detecting thermal losses, maintenance requirements and asset & structural issues that may not be identified under current workflows.

Firetail Environments provides specialist UAV-based thermal inspections, delivering repeatable, non-invasive data and specialised reporting to support informed maintenance and asset management.

- **Thermal Mapping**
  Grid-based surveys producing calibrated thermal and RGB mapping with high accuracy and detail
- **Asset Inspection**
  Assessment of roofs, walls, and storage infrastructure for thermal breaches and asset maintenance issues
- **Workflow Support**
  Project planning, flight operations and quality assurance data collection
- **Temperature Classification**
  Spatial analysis of thermal anomalies using mapping and visual inspection thermal and RGB data
- **Reporting & Compliance**
  Annotated maps and site-specific outputs to guide baseline condition, engineering, maintenance and audit processes

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Fully insured, CASA accredited Remote Operators Certificate 7414 | ARN 1106291 | Aeronautical Radio Operators Certificate

PRECISION THERMAL SURVEYS

FIRETAIL ENVIRONMENTS
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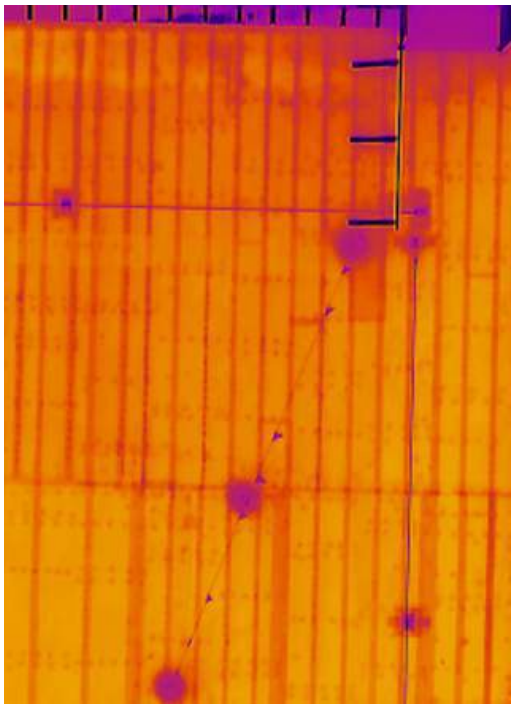

TECHNICALLY REPEATABLE PROJECT METHODS

Firetail applies repeatable, technically rigorous survey approaches aligned with best-practice asset management and environmental monitoring standards. Our workflow integrates multi-discipline surveys including thermal & RGB data to support high quality technical inspections and environmental assessments, these methods contribute valuable insights within broader frameworks such as:

- ***Insulation performance and quality assurance verification***
- ***Cold bridge and emission source identification***
- ***High resolution asset and infrastructure inspection***
- ***Accurate identification of structural and operational issues such as thermal breaches for efficient resolution deployment***
- ***Periodic maintenance inspections for quality assurance schedules***

Survey data is processed using technically sound and documented spatial methods and can be calibrated for repeat monitoring and reporting against performance, maintenance, or compliance benchmarks.

GENERAL METHODOLOGY AND DELIVERY

For thermal and visual drone surveys, Firetail Environments provides technically sound methods developed with integrity to ensure reliable and repeatable project outcomes:

- ***Develop systematic survey designs with baseline measurements and data protocols for full spatial coverage.***
- ***Maintain data quality and positional accuracy to ensure survey integrity.***
- ***Standardize collection methods for consistent analysis across flights.***
- ***Use appropriate flight altitudes and sensor resolution to capture detailed thermal and RGB data for anomaly detection.***
- ***Apply compliant processing workflows for repeatable output creation, spatial analysis, and thermal calibration.***
- ***Deliver outputs suitable for independent verification, monitoring, or auditing.***

Our process ensures integrity and confidence in robust data collection and analysis for informed facility management and risk assessment.

SNAPSHOT CASE STUDY

UAV thermal inspection was deployed to assess potential losses from a large cold storage facility as part of a quality assurance and inspection program.

High-resolution drone surveys, including calibrated thermal data, photopoints and standard imagery was collected and analysed to detect anomalies in roof and wall surfaces.

The inspection identified areas of thermal bridges, including one area 500 m² zone showing a consistent unexplained change in surface temperature suggesting a potential thermal breach.

The results enabled targeted inspections and informed maintenance actions, reducing investigation scope and supporting efficient asset management with spatially accurate data.

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