Enviro INSIGHT

environmental impact assessments

striving to perfect biological services

ABOUT US

Enviro-Insight was established in 2009 to provide scientific services to the mining, development, tourism, energy and agricultural industries. Our primary philosophy relates to the further development and improvement of census techniques by combining traditional methods with the use of the latest technology and adaptive approaches. We value the role of education in the industry and are involved in environmental training for both tertiary institutions and the private sector.

OUR FIELDS OF EXPERTISE

Enviro-Insight successfully combines standard field techniques with spoor tracking, chemical immobilization, relocation of fauna and flora, scat analysis (small mammal assemblages) and camera trapping to produce a more holistic product. The use of bio-accoustics is a growing field in ecology and is applicable in the surveying of amphibians, insects, avifauna and bats. Our use of technology for research purposes has been adapted to the field of bio-surveying and subsequently enables a holistic approach and far greater level of accuracy in all facets of biodiversity assessment. Finally, Enviro-insight have more than 12 years combined lecturing and training experience in the field of Zoology and more than 6 years in the fields of Fieldguiding and Trailsguiding.

OVERVIEW OF PROJECTS AND CLIENTS

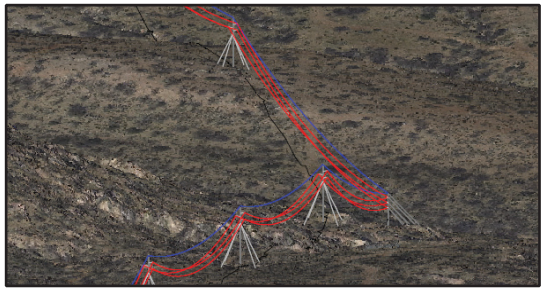
In the past, Enviro-Insight has worked in conjunction with Impacto (Mozambique), ERM, Kala-hari, AGES, Batusi, Pachnoda, Ekoinfo, the Department of Zoology (UP) and the Centre for Wildlife Management. Extensive work has been completed in the fields of Environmental Impact Assessments, Linear Structures (pipelines and power lines), Ecological Monitoring, Ecological Management Plans, Biodiversity Assessments and Educational Training. Notable clients include Anadarko, Vale, Riversdale, Exxaro, Fraser Alexander, Sasol, Eskom, Oppenheimer and Sons, Lonmin and Ferret Mining. Educational training has been done through the University of Pretoria and the private sector. Under the auspices of the Endangered Wildlife Trust (EWT), Enviro-Insight has been involved with the development of training material and safety inductions in the field of potentially dangerous wildlife and reptiles, throughout South Africa. The target audience was primarily Eskom management and field technicians.

Overview of what we do

The short answer is "everything to do with biology" within the realm of Environmental Impact Assessments (EIA). We incorporate botanical and zoological surveys and combine these data with advanced mapping techniques to provide a complete ecological study.

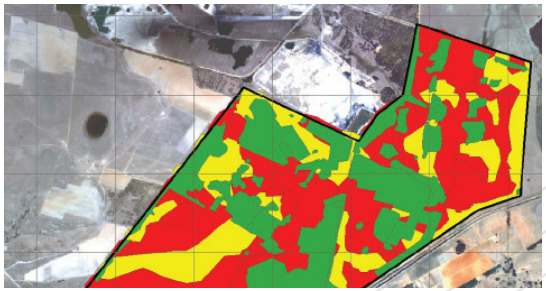
Biological Surveys

Botanical, zoological (snakes, birds, mammals, frogs, fish & insects) and ecological surveys are the primary focus of Enviro-Insight.



Linear Ecology

Environmental surveying of linear structures e.g. transmission lines, roads & railways is a specialized sub-discipline of EIA's and requires a team of highly experienced field biologists.



Mapping & Surveying

Our network of associates can provide a combination of services including GIS models, aerial surveying & mapping.

Herpetology includes the study of amphibians. Here a captured African bullfrog (*Pyxicephalus edulis*) is photographed before being released.

Herpetology

Herpetology is the study of reptiles and amphibians. Although this taxa forms a crucial part of the ecosystem, their inherent difficulty in sampling ensures that they are often under studied. Amphibians especially, form part of the world standard in monitoring programs due to their vital role as key ecological indicators.

Methods

A combination of methods is essential for achieving optimal results. Traditional methods are combined with state of the art technology to ensure success. For example, the commonly used method of pitfall trapping is enhanced by the addition of custom designed "funnel traps" and then combined with active searching and the use of automated sound recording equipment. Comprehensive desktop studies using the latest scientific literature are a mandatory part of every survey.

Products

The herpetological disciplines are incorporated into the respective relevant deliverables such as biodiversity baseline studies, monitoring programs, impacts and mitigations, environmental management plans, environemntal impact assessments and scoping reports. Photographic evidence of observed species are provided on disk. GIS-based sensitivity maps are included where applicable.

Research

Ongoing research as well as assistance with research is part of our policy. Linkage with science ensures quality surveys and we are devoted to plowing our knowledge back into science. Research in the field of herpetology is part of Enviro-Insight's on going commitment to the scientific community and the advancement of science. The company remains affiliated with tertiary institutions and private research bodies both internationally and within South Africa.

Training

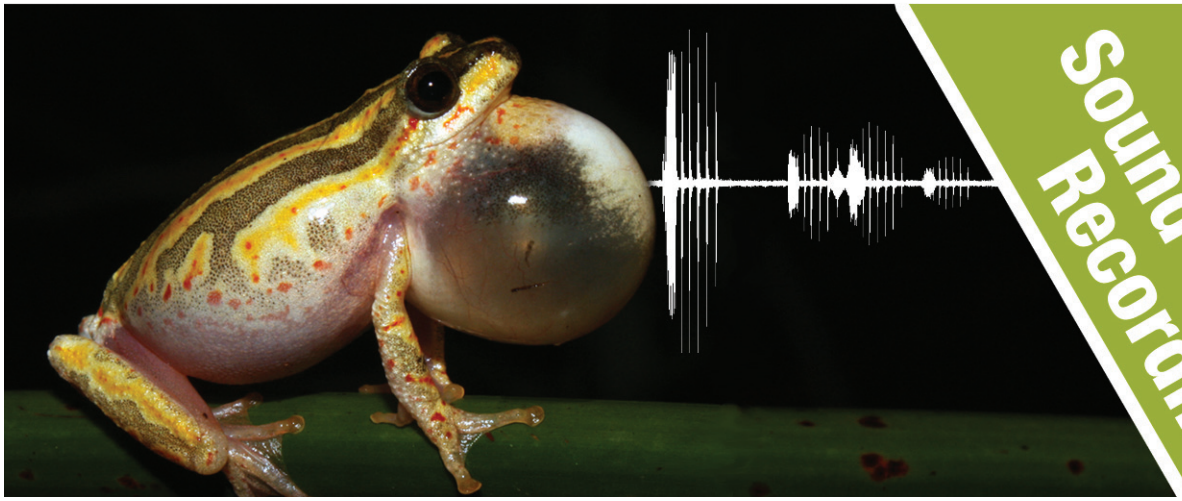
Developed In conjunction with the Endangered Wildlife Trust (EWT), Enviro-Insight conducts safety inductions to deal with the potential risks of venomous snakes that are inherent to most operations throughout Africa.

Trapping

Specialized, custom-built equipment is used to effectively trap herpetofauna. Drift fences intercept animals and direct them into funnel traps or pitfall buckets.

Finding herpetofauna by actively searching for them is the best method: lifting up rocks, digging in burrows, shining torches in treeholes and just knowing where to look while walking requires an experienced herpetologist.

Active Searching



Sound Recording

Precision, automated sound recording equipment is used to record amphibian vocalizations. A species survey can then be performed on the sound recordings using specialized software, saving many man-hours of fieldwork.

Botany

Botanical studies need to be conducted at the right time of year to ensure optimal flowering conditions because flowers are often the only way to identify a plant.

Botany is the cornerstone of all ecological studies. The interaction of plants with soils, wetlands and fauna is not only crucial for establishment of baseline data, but also to assess impacts of developments of all kinds.

Methods

Botany is a highly complex and specialized discipline incorporating a variety of methods. These include Braun Blanquet vegetation assessments, red-data plant verifications, BECVOL analysis (for browsing capacity assessment), satellite imagery and step point analysis (grazing capacity).

In addition, Enviro-Insight has full access to the LIDAR system, a state of the art tool which has recently been incorporated into savanna ecology.

Products

Botanical products are the most varied of the biodiversity sciences. the standard biodiversity baseline studies, monitoring programs, impacts and mitigations, environmental management plans, environmental impact assessments, rehabilitation action plans and scoping reports are supplemented with red-data species analysis and relocation, wetland delineation and protected tree marking. The latter is a process by which legally protected trees are quantified for the purposes of removal permit application as well as the establishment of biodiversity offset plans. Wildlife management plans and grazing capacities are also an important supplementary product for social assessments and human resettlements.

Research

All new plant species found in areas of southern Africa are recorded, sampled and delivered to the South African Biodiversity Institute (SANBI) and the National Botanical Gardens. As with other disciplines, botanical research is a priority of Enviro-Insight.

Vegetation communities

Once sampling has occurred it is possible to identify specific vegetation communities. These communities can then be used by zoologists to interpet the spatial patterns of animals and can also be used for sensitivity mapping.

Vegetation maps

After analyzing the collected raw botanical data it is presented into easily interpreted maps. This process is key to a successful botanical study. The very latest software and mapping technology is used. All data are provided to clients for use in their own GIS.

Vegetation sampling

All sampling is done by highly trained professional botanists. Plots of a certain area are selected and then all the plant species, their densities and the soil conditions are determined. This is all required for a complete understandnig of the vegetation community.

Mammalogy

Mammalogy is the study of mammals and their interaction with their environment. Mammals are an extremely high profile taxonomic group, which are the subject of increasing attention throughout the developed and developing world.

Methods

A combination of methods is essential for achieving optimal results. Traditional methods include small mammal trapping using Sherman traps, spoor tracking, large predator call-ups, jaw bone identification, active searching and habitat analysis. Our state of the art camera systems have been optimized over many years of experimentation to photographically (still and video) document the presence of small, medium and large mammals.

A four-toed Sengi (*Petrodromus tetradactylus*) captured during a mammal survey. All captured animals are always released unharmed.

Products

The mammal disciplines are incorporated into the respective relevant deliverables such as biodiversity baseline studies, monitoring programs, impacts and mitigations, environmental management plans, environmental impact assessments and scoping reports. Photographic evidence of observed species are provided on disk. GIS-based sensitivity maps are included where applicable.

Research

Enviro-Insight is actively involved with the University of Pretoria's Zoology Department, and Centre for Wildlife Management. Our new findings include documentation of never before seen behaviour (hybridization between species) as well as new distributional records for a number of species.

Training

The mammal safety inductions were developed in conjunction with the endangered wildlife trust (EWT). Many developments are taking place in areas which are home to potentially dangerous species such as the famous Big 5. Over a decade of experience has been called upon to design a training program used to help workers and specialists to stay safe in such regions, and over 400 participants have been trained and assessed.

Camera Trapping

Camera trapping relies on remote infra-red cameras which acquire photographs and video footage of mammals within study areas. It is the new industry standard for mammal assessments, vital in providing photographic evidence of small, medium and large mammals throughout the subregion.

Spoor Tracking

Spoor tracking is considered to be the world's oldest science, and does not rely on direct observation of the animals. It is also not limited to only footprints but uses all mammal signs such as hair, droppings and territorial markings. It is an essential tool in the assessment of mammal presence/absence/density and seasonality.

Small Mammal Trapping

Small mammal trapping is another industry standard which is fundamental to assessing environmental sensitivity and integrity of an area. It is also used to monitor changes in the ecology of an environment, once development operation has commenced.

Ornithology

Ornithology relates to the study of birds and their interaction with their environment. The profile of this discipline has grown significantly in recent years due to the phenomenal growth of the avifaunal tourism industry as well as the increasing interaction between birds and developments, especially power lines.

Methods

Combining methods is essential. Traditional methods of point sampling, habitat analysis, low impact flushing and call ups are combined with the latest technology such as the use of automated sound recording equipment. Comprehensive desktop studies using the latest scientific literature are a mandatory part of every survey. Walkdowns provide a key part of assessing the potential impacts of large power lines on sensitive avifauna. Comprehensive desktop studies using the latest scientific literature are a mandatory part of every survey.

Products

The avifaunal disciplines are incorporated into the respective relevant deliverables such as biodiversity baseline studies, monitoring programs, impacts and mitigations, environmental management plans, environmental impact assessments and scoping reports. Photographic evidence of observed species are provided on disk. GIS-based sensitivity maps are included where applicable.

Research

Enviro-Insight is actively involved with members from Birdlife International as well as the University of Pretoria. The nature of our work allows our teams to visit locations that are inadequately studied and report back new and exciting findings (including new species to science) as well as new distributional records.

An ornithologist may need to take a high resolution photograph of a bird to help with identification of rare species or even just to provide evidence of a particular species.

Birding

Ornithological studies require hours of non-stop vigilance by a trained ornithologist. Typically, a pair of binoculars, a notebook, and a device for recording and playing bird sounds is all the hardware an ornithologist requires. However, an encyclopedic-like knowledge of the hundreds of bird species found in most locations in southern Africa is essential to identify birds correctly and efficiently. This requires years of field experience. Data on bird community composition and bird abundances are collected and related to the vegetation communities present. This allows a deeper understanding of the avifauna ecology of an area an further enables the monitoring of disturbances.

Bird Song

Birds are very vocal and produce songs that have various functions e.g. territory songs, mating songs and aggression songs. Most bird song is species-specific which enables a trained ornithologist to identify birds without visual verification. Automated song recording equipment can be deployed to record bird song and identify each species using special software.

An entomologist's eye-view of a longicorn beetle.

Invertebrates

The value of invertebrate biology cannot be understated in emerging fields of restoration ecology, bio-monitoring, invasion biology and environmental impact assessments. Invertebrates represent fast acting r-selected taxa that respond quickly and decisively to environmental changes and are therefore a vital facet to a holistic ecological study.

Methods

Due to the huge scope of the group, invertebrate biology requires a focused approach on a select few representative taxa. The most common study groups are beetles, ants, butterflies, spiders and scorpions. Methods focus around pitfall trapping, active sweeping, bush beating, active searching and the use of ultra violet lights.

Products

The entomological disciplines are incorporated into the respective relevant deliverables such as biodiversity baseline studies, monitoring programs, impacts and mitigations, environmental management plans, environmental impact assessments and scoping reports. GIS-based sensitivity maps are included where applicable. Finally, invertebrate biology is the most powerful of all the biodiversity disciplines when it comes to monitoring of environmental changes, which is the reason monitoring programs and restoration ecology studies are often based on this taxonomical group.

Research

All new entomological species found in areas of southern Africa are recorded, sampled and delivered to the University of Pretoria's Department of Zoology. As with other disciplines, entomological research and the advancement of knowledge about the taxa is a priority of Enviro-Insight.

Photography

Invertebrate biologists often make use of high definition photography to "capture" invertebrates and later identify them. This is especially crucial for studies in areas where it is not easy to export sampled animals.

Active sweep netting is one of the most important methods for sampling invertebrates. This is because it can be standardized between sites and the species diversity and abundances can then be compared. It is also a very low cost method but relies on a fit and experienced entomologist to perform the technique to a satisfactory standard.

Sweep Netting

Pitfall Trapping

Pitfall trapping also allows comparison of invertebrates between sites and captures a different assemblage of invertebrates compared to sweep netting. For example, nocturnal crawling invertebrates like scorpions and spiders are easily sampled by pitfall traps. The efficacy of these traps is increased by adding drift fences to guide the invertebrates into the pitfall bucket.

Linear Ecology

1 Linear developments are a vital component of development strategy and progress in sub-Saharan Africa. Power lines, roads, rail networks and pipelines bring services to people and their communities, in the process helping to create jobs and build the economies of developing nations. Such developments traverse great distances, crossing many habitats and impacting on the natural and cultural environment. These are challenging projects. Many challenges are inherent in linear construction: engineering, logistic, economic viability and environmental sustainability.

2 Linear work most often involves a scoping EIA phase (primarily desktop and drive through) as well as an environmental walkdown. An environmental walkdown is a standard practice for all linear developments in Southern Africa. Its function is critical in the highly detailed verification of the findings of previous specialist studies. It is often the final phase in the statutory environmental protection process of such developments, allowing for the formation of an environmental management plan (EMP) as well as small-scale logistic mitigation.

3 The scope of linear work encompasses all the relevant levels of detail, including environmental management plans (EMP phase), environmental impact assessments (EIA), protected tree marking, environmental impact assessments (EIA), environmental management program report (EMPR) and strategic environmental assessment (SEA). All disciplines including zoology, botany, ornithology, wetland ecology, heritage and archaeology are included.

Enviro-Insight also offers the following services through our specialist network:

- Soil science
- Wetland & aquatic science
- Archaelogy and heritage

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