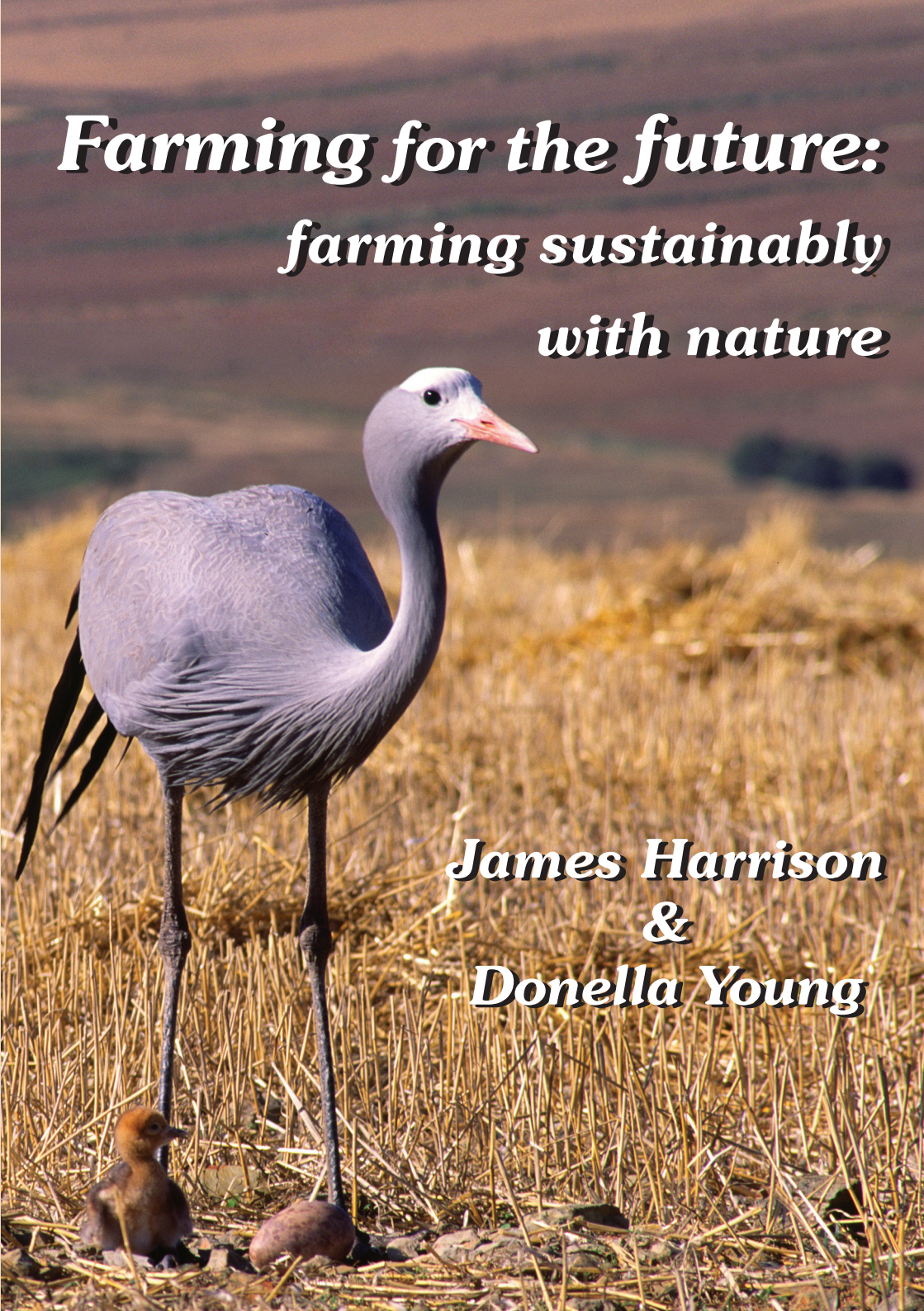
Farming for the future:
farming sustainably with nature



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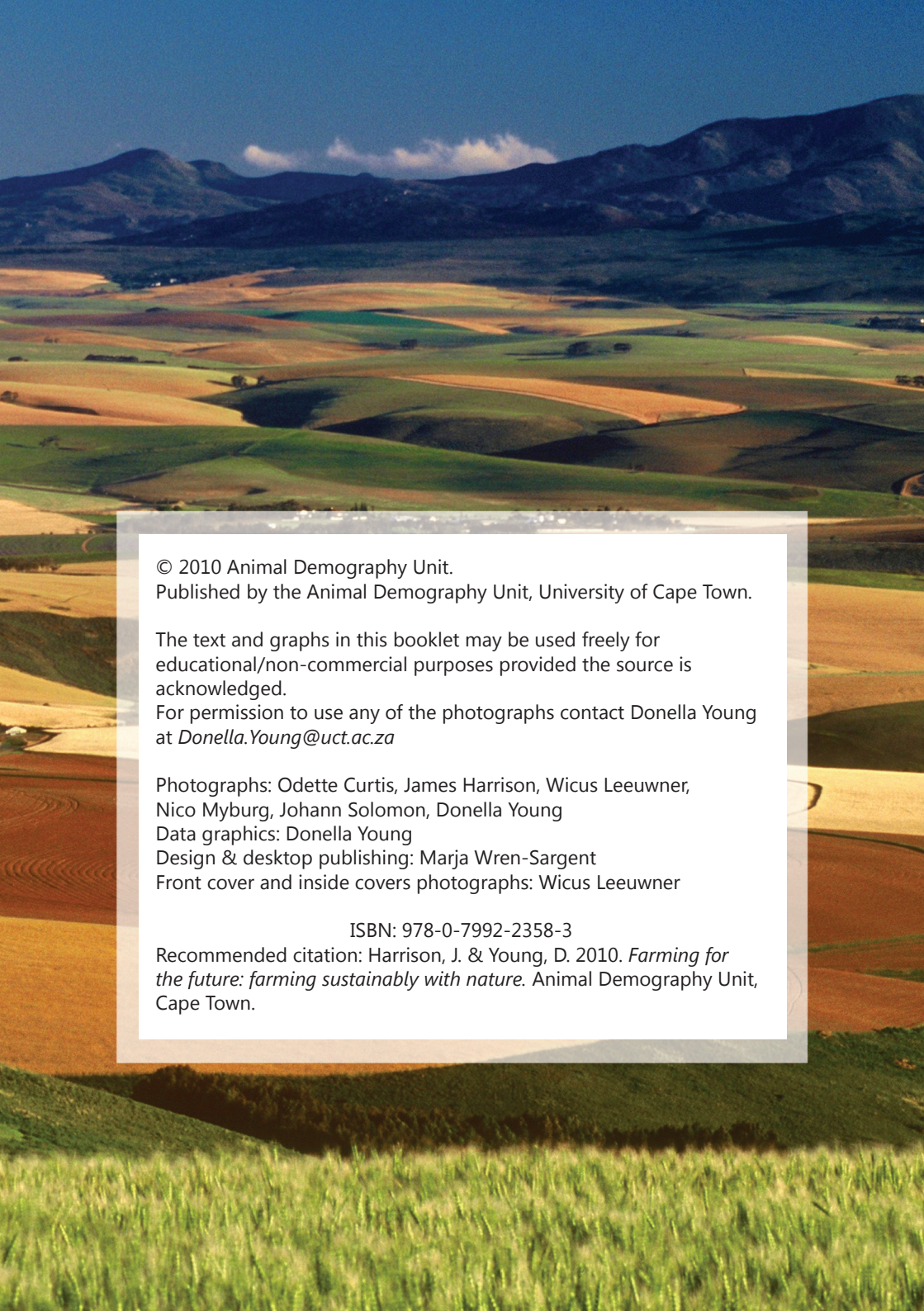

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Introduction

This booklet is for rural landowners, especially farmers.

Farmers often feel that they are not appreciated enough for the service that they render to society. Unfortunately, that feeling is probably justified. However, we can gladly report that at least one small sector of society does value the farmer very highly, namely the conservationists. Conservationists acknowledge that the goals of conservation can never be adequately achieved by means of nature reserves alone.

Farmers manage the majority of South Africa's land, fully 80% of it. It stands to reason that if conservation does not happen on 80% of the land, it cannot succeed in the country as a whole. Truly, the farmer is the custodian and steward of our natural wealth and heritage, and we South Africans live in the country that is ranked as the world's third richest in wildlife!

Fortunately for conservation and the wildlife of South Africa, there is a growing trend among farmers to take a keen interest in conservation and promote the cause on their lands. If this trend continues, the conservation of nature will indeed go from strength to strength in South Africa. Farmers are an innovative community and many farmers have implemented land use and management practices that do meet conservation objectives. We would like to acknowledge what we have learnt from such farmers.

These days, nature's magnificent endowment of fauna and flora is called "biodiversity". The term "biodiversity" is just shorthand for the totality of all living things and the ecosystems that they live in. An "ecosystem" is the ecological system formed by the complex interaction of living things with each other and with their physical environment.

Healthy soil and clean water, both vital to farmers, are amongst the key "services" provided by healthy ecosystems. If biodiversity declines, then the ecosystem's ability to provide such services also declines. Ecosystem services include clean air and water, fertile soil,

Pollination of blossoms is an example of an ecosystem service without which there would be no fruit! Photo by Wicus Leeuwner.

nutrient recycling, pollination, carbon sequestration, regulation of climate and floods, and countless more, some of which are still being discovered by science. And let us not forget how the beauty of nature also feeds the human soul.

The principal objective of conservation is to preserve biodiversity, in all its complexity, as well as the natural resources that sustain it. The reward for the conservationist landowner is that the ecosystem on his land remains vigorous and continues to provide the essential services mentioned above. Those natural resources and services provide the farmer with his livelihood, so who better than the farmer to understand the importance of conserving biodiversity.

But let us not be too romantic about all this. The goals of the farmer, to produce food on an industrial scale and make a profit, are not perfectly compatible with the goals of conservation, and probably never will be. However, over the past fifty years or so, there has been an enormous growth in our scientific understanding of how natural systems work. This puts us in a much better position to understand how agriculture and conservation can co-exist and even be of benefit to each other.

The purpose of this booklet is to present some of that ecological knowledge in a form that is not excessively technical and, we hope, is relevant and interesting to landowners. The emphasis here is on large terrestrial birds, but you will find that the management actions we recommend will be of benefit to a wide range of wildlife, and will broadly promote the cause of conservation on your lands.

Nowadays, there is a growing market for products that are environmentally friendly. These products often expose the consumer to the story of the product and the people and environment in which it was produced in a sustainable manner. This helps increase the value and appreciation of the product in a society where people have increasingly become isolated from nature. This booklet will help you make that connection between your products and the natural world, and to tell a story that the world will want to hear.

Clean water, another benefit of a healthy ecosystem that is often taken for granted. Photo: Donella Young.

The text is divided into three sections: (1) twelve points of general advice on conservation-friendly land management, which we call the "Desirable Dozen", and (2) species accounts for eight species of large terrestrial birds, giving interesting information about each species and specific tips on how to manage for their benefit (statistical information for each species is taken from the results of the Coordinated Avifaunal Roadcounts [CAR] project), (3) a list of contacts and references that will be useful for more information and for assistance with wildlife management.

Nelson Mandela wrote: "If we give our very best to all the children of today, and if we pass on our planet in the fullness of her beauty and natural richness, we will be serving the children of the future". We trust that seeing wildlife flourish as a result of your actions will provide you and your children with rich rewards.

James and Donella

The Desirable Dozen

It has been estimated that farmers own 80% of the land in South Africa, much of it covered by the most rare and threatened vegetation types in the country. This statistic alone demonstrates that our country can only succeed in its conservation goals with the active and willing participation of private landowners. Our message to all landowners is that they can, and do, make a difference to nature conservation in South Africa. And the more land one owns, the bigger difference one makes! Simply by owning land, one becomes a steward or caretaker of the natural environment and all living things on that land, and one can either be a good caretaker, or a bad one. This chapter is intended to assist you in becoming a good one.

Large terrestrial birds are among the most beautiful and spectacular creatures in South Africa's wildlife, and farmers in particular carry a great responsibility for their conservation. With their requirements for enormous spaces, these birds are dependent on farms for their very existence.

Here we present a simple guide for landowners on how to maximize their contribution to conservation. What we present here are broad principles which are widely applicable. We are aware that there are many details that we have not included, but these details tend to vary from situation to situation, and it is better to consult with experts on the specific management actions that are most appropriate in your circumstances. We strongly recommend that you consult the websites, publications and staff of the various organizations that are listed elsewhere in this booklet.

There are 12 things – the "Desirable Dozen" – that landowners can do to contribute meaningfully to the conservation of wildlife, including large terrestrial birds, on their lands.

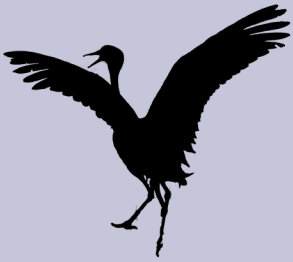
Each of the Desirable Dozen also holds direct or indirect benefits for the landowner.

Blue Cranes, our national birds, in a displaying dance. Photo: Wicus Leeuwner.

In addition, there are more general benefits from practising biodiversity conservation that are worth bearing in mind. Gerhard Pretorius* of the Rooibos Biodiversity Initiative summarized them as follows (with slight adaptations):

- **Decreased input costs:** Maintaining the biodiversity on farms will ultimately reduce input costs due to maintaining organic matter in the soil, integrated pest management and long term production.
- **Compliance with legislation:** Given the international focus on sustainability, compliance with environmental and agricultural legislation will become vital to doing business. Non-compliance will increase input costs, limit expansion and could deny access to key markets.
- **Increasing land value:** Responsible biodiversity management could increase the value of land due to securing environmental services and avoiding prosecution on existing environmental legislation. Failing ecosystem services and legislated penalties would reduce the value of poorly managed properties.
- **Strategic positioning with the SA Government:** The SA Government is taking sustainable production and natural resource management increasingly seriously. A proactive stance on biodiversity by, for example, the rooibos and wine industries (the Rooibos and the Wine Biodiversity Initiatives, respectively) will position them well with regard to managing other issues like social transformation and land redistribution.
- **Competitive advantage in key markets:** With more buyers and consumers becoming aware of sustainable production and environmentally friendly products, aligning themselves with these changes can give industries a competitive advantage in global markets.
- **Expanding markets to increasingly aware consumers:** Certain markets and specific retailers attract consumers that lean towards responsible agriculture and sustainable production. Marks & Spencers and Whole Foods are examples, and local retailers like Woolworths and Pick n Pay are joining this trend.

The Desirable Dozen:



1. Adopt mixed farming strategies.
2. Use poisons responsibly.
3. Monitor overhead power lines and other potentially dangerous structures.
4. Protect natural veld.
5. Create ecological corridors.
6. Protect wetlands.
7. Protect watercourses and floodplains.
8. Protect breeding and roosting sites.
9. Manage fire appropriately.
10. Control dogs, cats and livestock.
11. Promote awareness among farm employees.
12. Collaborate with others.

*Pretorius, G. 2008. *Rooibos Biodiversity Initiative*. Natura Libra Environmental Consultants, Malmesbury.

1. Adopt mixed farming strategies

Research shows that large terrestrial birds, and wildlife in general, do better in areas where there is mixed farming than in areas where there is intensive cultivation of a single crop. In particular, a mix of grain cultivation and stock farming appears to provide birds with a beneficial patchwork of habitats. This is especially true when patches of natural veld are also available in the vicinity. The variety of habitats ensures that birds and other animals always have suitable areas for foraging, throughout the changing seasons of the year, and do not have to move out of a district to find what they are looking for. An advantage of foraging habitat nearby is that birds are encouraged to set up breeding sites in the area.

Of the specialized types of farming, stock farming with sheep, cattle or game on natural veld is by far the most wildlife-friendly type of land use, provided that over-grazing is avoided.

Management recommendations

- Adopt mixed-farming strategies, preferably with the inclusion of some stock or game farming.
- Where possible, rotate crops and pastures and let lands lie fallow. Use "no till" to maintain healthy soils.
- Preserve areas of natural veld.
- Diversify income streams through a diversity of land uses.

Benefits to the farmer

- Mixed farming is a good long-term strategy in many situations because it helps ensure flexibility in the face of changing markets and changing weather patterns. The mixed farm does not have all its eggs in one basket!
- Farmers who conserve natural habitats and wildlife often find that ecotourism can become a useful supplementary activity on their farms.

2. Use poisons responsibly

It is certain that both the deliberate and unintentional poisoning of large terrestrial birds has led to dramatic declines in their populations in many areas. Especially implicated are organophosphates used in seed dressings. The responsible use of agrochemicals is absolutely essential if these birds are to flourish on farms. Many other species have also been affected by careless use of poisons, in particular, scavengers such as vultures and other birds of prey that are killed at illegally poisoned carcasses. It is illegal to use agrochemicals to kill wildlife, and the few that may be used under strict permit conditions are severely restricted. In general, farmers need to choose agrochemicals, including pesticides, carefully so that only safe, biodegradable products are used on their lands. Equally important is adequate locked storage and the controlled use of poisons by farm employees who may abuse them to kill birds and other animals for the pot.

Management recommendations

- In areas where rodents are a problem, erect wooden poles as perches for raptors and owls. Predation by these birds may be sufficient to control the problem without the use of poisons.
- Consult the suppliers of chemicals and use only those chemicals that are relatively safe and biodegradable.
- Follow all recommended safety measures and recommended methods and doses for application, according to label instructions, and do not mix your own concoctions.
- Train farm employees in the safe and appro-

priate use of chemicals. This is a mandated labour regulation.

- Keep all toxic chemicals safely and securely stored, and monitor stores to ensure that they are not being stolen and abused. This is a mandated health and safety regulation.
- Dispose of unused or unwanted chemicals through the correct channels for hazardous wastes, i.e., store them in a safe and secure location for later disposal, and dispose of them at a dump site officially designated for hazardous waste.
- Investigate alternative methods of pest control, e.g., bio-control of insects with natural predators or use of natural hormones to disrupt the breeding of pests. Consult agricultural extension officers or the Endangered Wildlife Trust's website *www.ewt.org.za* (select Wildlife Conflict Mitigation Programme, or call the Helpline 0824634104).
- Investigate alternative methods of protecting small livestock, e.g. the traditional shepherd caring for livestock, or the use of an Anatolian Sheepdog to protect livestock. Consult agricultural extension officers, the Endangered Wildlife Trust or the Cape Leopard Trust that aims to facilitate conservation of the Cape's predator diversity using methods of benefit to the farmer: *www.capeleopard.org.za*, email: *contact@capeleopard.org.za* or phone Quinton Martins: 027-4829923.
- If poisons have to be used in the control of problem animals, consult with nature conservation officers or other experts on the best methods and materials to use, so that non-target species are not affected.
- Report cases of accidental or deliberate poisoning of wildlife to Endangered Wildlife Trust's Wildlife Conflict Mitigation Programme, phone 011-4861102 ext 211.

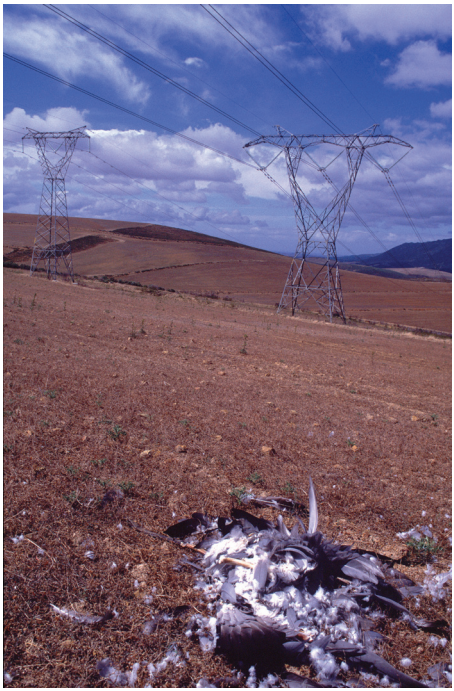
Benefits to the farmer

- Reducing the use of chemicals can save money.
- Reducing the use of chemicals, especially poisons, promotes healthy water and healthy soil which are beneficial to the farmer.
- Where use of agrochemicals is essential, wise and careful choice and application of those chemicals can minimize collateral damage to wildlife and humans.
- Safety measures reduce the risks of tragic accidents involving employees and wildlife.
- Compliance ensures that the farmer is not prosecuted for breaking labour laws.
- Tolerance of scavenging animals, e.g., vultures, reduces the risk of spread of disease from carcasses.
- Tolerance of birds like guineafowl helps to control insect pests, and owls and other birds of prey help to control rodents.

A secure store for poisons. Photo: Wicus Leeuwner.

3. Monitor overhead cables and other potentially dangerous structures

Many large birds are killed in collisions with overhead cables – both electricity cables and telephone wires. Other structures, such as fences, reservoirs, drinking troughs, concrete canals, etc., can also be the cause of animal deaths if they have not been designed in a wildlife-friendly manner. The problem is usually caused by one of two things: (1) an obstacle (e.g., a cable or a fence wire) is invisible to the animal, especially in conditions of poor visibility, with the result that the animal runs or flies into it, causing injury or death; or (2) the animal enters a structure (e.g., a concrete trough or canal, or water reservoir), but then finds itself trapped, with the result that it either drowns or dies of exposure. Small objects typically found in litter or rubbish dumps (e.g., tin cans, plastic bags, string) can sometimes also cause problems for animals when they become trapped in, or entangled with, these items.



Large birds are particularly vulnerable to collision with overhead cables as they cannot take enough avoidance action at the last minute. Photo: Wicus Leeuwner.

In most cases, dangerous structures can be made safe by means of quite simple and inexpensive modifications. For example, a few bricks in a drinking trough will allow a crane chick to clamber out without drowning, and a log, pole, branch or ladder attached to the side of a reservoir will help a thirsty eagle to drink without falling into the water and drowning.

Management recommendations

- Where overhead cables cross farmlands, it is very helpful if the landowner checks under them from time to time and records the presence of carcasses and other details of collision victims. The same applies to victims of electrocution at pylons and transformers. This information should be passed on to relevant authorities (see below).
- Farmers should note all dead and injured animals and try to find out how they died. This will often be obvious from the circumstances in which the carcass is found, and the nature of the injuries.
- Structures that are responsible for deaths and injuries should be modified. Eskom, through its partnership with the Endangered Wildlife Trust, has shown great willingness to make their cables safer for birds by attaching markers, but they need to be told which cables are causing problems, and this is where information from landowners can make all the difference. Contact Eskom-EWT Strategic Partnership on 0860111535 or 011-4861102.
- Other structures, such as fences and reservoirs, can easily be modified by the farmer

him-/herself. This will usually involve making the structure more visible, or making it easy to climb out of. For example, pieces of bright material (e.g., pieces of silver-painted wood or metal) attached at intervals will make a fence more visible to large birds and antelope which may otherwise fly or run into it and injure themselves. Fences that do not present an obstruction at ground level are good for the movement of small animals, such as tortoises.

- In the case of electrified fences, avoid electrification of low-level wires because these electrocute tortoises and other small animals.
- Swimming pools are often a hazard to wildlife, especially small creatures such as toads. The beach-type of pool is the safest design (also for children!). Other pools can be made safer by provision of a plank with one end floating in the water and the other end on the edge of the pool.
- Keep rubbish limited to one small, dry area on the farm, and preferably bury it.

Benefits to the farmer

- Dead animals can pollute water and cause disease. Preventing animal deaths will prevent the need to empty and clean fouled reservoirs.
- Bird collisions and electrocutions on power lines can cause power failures. It is obviously in the farmer's interests to prevent this.
- Structures which cause problems for wildlife are likely to also cause problems for domestic stock, so there are likely to be direct benefits to the farmer in protecting wildlife.

A few stones in a drinking trough will allow crane chicks or other small creatures to climb out without drowning. Photo: Donella Young.

4. Protect natural veld

While is it is true that some plants and animals do well in disturbed and altered environments, the majority of species are dependent on natural environments that have not been artificially disturbed by human activities, such as ploughing, draining and frequent burning.

Most farms have areas or patches of relatively undisturbed, natural veld. Often these are areas that are not suitable for cultivation because they are too steep or too rocky or too wet. Such areas, although useless for agricul-

Right: Whenever possible conserve indigenous veld. This Renosterveld is now very scarce. Photo by Odette Curtis.

Allow natural vegetation to grow wherever cultivation is impossible or not sustainable or productive enough. Photo: James Harrison.

tural purposes, are invaluable for biodiversity conservation. There are parts of South Africa, especially in wheat, maize and sugarcane farming districts, where vast tracts of land have been transformed for agriculture, except for small fragments of unsuitable land. In such transformed landscapes, patches of natural veld are of immense value because they represent "banks" or "savings accounts" of the original biodiversity of those landscapes. Landowners can make a truly important contribution towards biodiversity conservation by retaining such fragments in their natural state, and protecting them against further disturbance or degradation.

The network of protected areas in South Africa is unlikely to ever be extensive enough to protect the full complexity of our unique fauna and flora. Large terrestrial birds, in particular, roam across vast tracts of land and therefore cannot be adequately protected by small nature reserves. Furthermore, many wide-ranging species, including some large terrestrial birds (e.g., the bustards and korhaans), are partially or completely dependent on natural veld for their survival. The private landowner who conserves natural veld plays a vital role in filling the gaps and complementing the efforts of nature conservation agencies.

Management recommendations

- Protect natural veld from destructive transformation, i.e., ploughing, draining or infilling (in the case of wetlands), afforestation with plantations of alien trees, clearance of indigenous trees, uncontrolled invasion of alien plants, and bush encroachment or soil erosion resulting from overgrazing.
- Wherever possible, set aside a buffer zone around patches of natural veld, and allow natural veld regeneration to occur within that buffer zone. The wider the buffer, the better protected the patch will be from the impacts of surrounding land use, e.g., crop-spraying.
- Avoid construction of new tracks and farm roads that may lead to gully erosion. Fine-textured soils, wetlands and steep slopes are particularly unsuitable for roads.
- Avoid off-road driving, including the use of quad-bikes in the veld, as this kills or injures plants and animals.
- Where undesirable factors are having a negative impact on the veld, such as the spread of invasive alien vegetation, take steps to control and reverse such factors.
- Recognize that some veld types, e.g., fynbos and grassland, need periodic fires to sustain biodiversity. Ensure that burning takes place at the recommended intervals (see 9, below).
- Invite qualified biologists with a knowledge of your area to visit your protected patches and do biodiversity surveys. The results of such surveys will help to document the significance of your land to conservation, and will provide further useful pointers for appropriate management.
- It is highly recommended that farmers set aside natural areas in the Stewardship Programme of their provincial nature conservation agency, e.g., CapeNature. In terms of this programme, the conservation value of the land is officially recognized, and the responsibility for effective management is shared between the landowner and the conservation agency. (See provisions under the Protected Areas Act.) This will contribute to the achievement of national conservation goals for the vegetation types in your area and protect them for future generations.

- An Environmental Management Plan (EMP) should be drafted for a farm. It does not have to be based on an expensive study, but should identify all sensitive areas of the farm, as well as vegetation types, wetlands and special habitats, and describe procedures to protect such areas.

Benefits to the farmer:

- There may be benefits to the farmer in the form of pest control, because natural predators of pest species (e.g., predatory and parasitic insects and insectivorous birds) are present in natural ecosystems and will exploit the pests in neighbouring crops as a source of food.
- Pollination of insect-pollinated crops, e.g., fruit trees can occur naturally. Natural, indigenous pollinator species such as certain wild wasps, bees, moths, etc., live in natural veld, but will move into neighbouring crops and bring about pollination, provided that pesticides have not been applied.
- Natural beauty and rich wildlife on the land. Especially more extensive protected areas can become an attraction for visitors (e.g., wildflowers in Namaqualand, hunting on some Karoo and bushveld farms, angling for indigenous fish in well-managed rivers and dams) and thus create economic opportunities to diversify into ecotourism enterprises.
- Membership of a Stewardship Programme will give you access to professional advice on veld management.
- The satisfaction of making a substantive contribution to biodiversity conservation.

5. Create ecological corridors

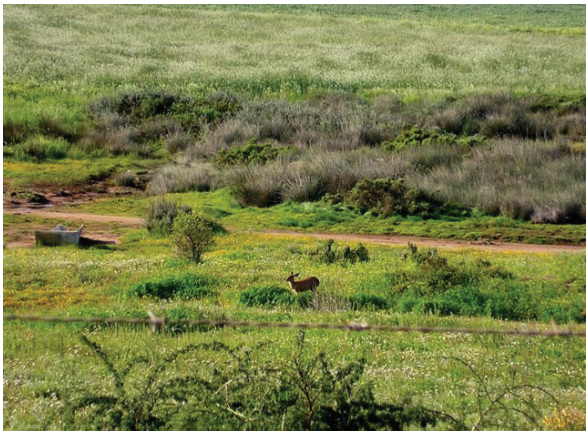
The conservation value of patches of natural veld is greatly improved if they are connected by corridors of natural or semi-natural habitat. Such ecological corridors literally provide passages through which plants and animals can move between patches that would otherwise be isolated by man-made habitats which act as barriers to the movements of wildlife. Corridors permit inter-breeding between populations living in otherwise isolated patches, and thereby greatly improve the long-term viability and sustainability of these populations.

Corridors of indigenous vegetation linking patches of indigenous veld allow easy movement of animals. Photo: Donella Young.

In addition to relatively large patches and wide corridors of natural vegetation, semi-natural habitats can also be useful to wildlife. Weedy strips on the edges of fields and along road verges can provide food and shelter, and even breeding habitat, to a number of species. Among large terrestrial birds, the smaller species, such as gamebirds and korhaans, can benefit from such "mini-corridors", not to mention many other, smaller birds that rely

Allow natural veld to thrive on road verges. Photo: Donella Young.

A corridor of indigenous vegetation between cultivated fields. Photo: Wicus Leeuwner.



on the seeds and insects that such weedy habitats provide. "Neat and tidy" farms on which all habitats are intensively managed, are less hospitable to wildlife.

Management recommendations

- Landowners often have the opportunity to create corridors along water courses, along rocky ridges, and alongside roads, without having to sacrifice any valuable agricultural land.
- Wherever possible, ecological corridors should cross farm boundaries so that species can move from farm to farm without hindrance.
- Note that the value and effectiveness of corridors improves with greater width; corridors should be at least 50 m wide, but a width of 100 m or more is recommended.

Benefits to the farmer

- Weedy habitats are compatible with the principles of Integrated Pest Management because they provide refuges for the predators that help to control pests.
- Areas which were thought to be "waste lands" can instead be viewed as ecological corridors that perform an essential function on the farm.

Left: Corridors of indigenous vegetation are extensively used by a wide variety of animals. Photo: James Harrison.

6. Protect wetlands

Water is an essential requirement of life, and in a dry country like South Africa, freshwater and the wetlands that hold it are of very special importance. Wetlands are characterized by waterlogged soils, and by plants that are adapted to wet conditions. Both the water and the plants are vital resources to many species of animals, including many birds. Not only that, but wetlands improve the quality of water downstream, and the vegetation helps to prevent flashfloods and erosion from occurring. Because wetlands retain water for some time, the water has a chance to filter down into the ground and recharge the aquifers that are so important to many farmers.

Note that seasonal wetlands (i.e., wetlands that hold water only in the rainy season) are just as ecologically important as wetlands that hold water all the time. When wetlands are made deeper (by dredging or by the erection of weirs), or shallower (by digging drainage ditches or by infilling), their ecological functioning is disrupted, to the detriment of the wildlife – and the humans! – that depend on them.

Amongst large terrestrial birds, it is especially the three species of crane that depend on shallow, vegetated wetlands which are unpolluted and not excessively disturbed by livestock or fire.

Because dams and weirs affect the supply of water to wetlands downstream, careful consideration needs to be given to their construction. They should be built only if absolutely necessary, and should not be made larger than necessary. Existing dams should be seen as artificial wetlands which should be managed for wildlife in much the same way as natural wetlands.

Landowners should view wetlands as very special assets to be carefully conserved, together with their fringing habitats (wetland grasses, reed beds, trees, etc.) Where it is necessary to create irrigation dams and watering points, care should be taken not to damage natural wetlands.

Management recommendations

- Avoid draining, damming, deepening or infilling wetlands.
- Avoid grading or trying to straighten rivers, as this causes the water to flow much faster and cause more damage lower down, not to mention the destruction of many living organisms in the water and wetland vegetation that would hold the soil.
- Set aside an undisturbed buffer zone around wetlands; this should be at least 50 m wide, but preferably wider.
- Limit construction and use of roads in wetlands and their buffer zones as much as possible.
- Avoid extracting excessive amounts of water from wetlands, or from boreholes near wetlands.
- Do not burn reeds more frequently than once in 10 years.

Avoid grading rivers. Note the poor quality of the water. Photo: Wicus Leeuwner.

Allow indigenous vegetation to grow around some of the fringes of dams. Photo: James Harrison.

- If wetlands are used for grazing, monitor the condition of the vegetation for signs of overgrazing.
- Do not allow hunting of waterfowl during the breeding season of these or other waterbirds.
- Do not allow large quantities of waste, fertilizers and silt to run directly into wetlands; create ditches/swales to receive and filter polluted runoff.
- If a dam has to be built, at least some portion of its banks should be made gently sloping, and a generous area of the dam be made shallow, because shallow water is better habitat for aquatic plants and animals than deep water. Consider creating an island to encourage nesting waterbirds.
- Allow natural vegetation to grow up around the fringes of dams.
- Clear dams of fish that are not indigenous to your area, and restock with indigenous fish. (Many indigenous fish species are also suitable for angling.) This operation must be carried out by a qualified operator. Contact CapeNature (or other relevant provincial nature conservation agency) for guidance.
- If you wish to rehabilitate or modify a wetland, consult experts, such as the Mondi Wetlands Project, for advice (*www.wetland.org.za*).

Benefits to the farmer

- Improved water quality downstream.
- Recharged groundwater.
- Healthy water for livestock.
- Protection against flash floods and erosion.
- Grazing resources in times of drought.
- Natural beauty and rich wildlife on the farm.

7. Protect watercourses and floodplains

Watercourses convey water across the landscape. Large watercourses are known as rivers and streams, but, in South Africa, most watercourses are dry most of the time, and hence tend to be undervalued. However, even the smallest watercourses have great ecological value, not least because they ultimately feed into larger streams and rivers.

Even apparently dry watercourses are recognizable because they are always characterized by taller, denser vegetation than in the surrounding landscape. This is because groundwater tends to be more abundant along watercourses.

Not only the water in watercourses, but also the dense riparian (river edge) vegetation makes them ecologically valuable to many animals. The trees and shrubs provide fruit, nectar, seeds and browse for a variety of herbivores, and the concentration of herbivores is, in turn, a food source for a variety of insectivores and carnivores. The dense vegetation also provides shelter and nest sites for animals.

Watercourses span relatively long distances across the landscape, and thereby connect different parts of an ecosystem: for example, hilltops and lowlands, or inland areas and coastal areas. Such connections are important to animals that need to use different habitats at different times of the year, or under changing conditions of environmental stress, such as drought.

As with wetlands, watercourses need to be protected to sustain healthy ecosystems. Due to their important role as ecological corridors, it is important that their continuity is not broken, and that surrounding land use is not allowed to impact negatively on the condition of their habitats. Where watercourses cross relatively level ground, they usually have floodplains beyond the banks of the actual channel of the watercourse. Floodplains are not as sensitive as the channel itself, and its banks, but also need a degree of protection because they play an important role in times of flood.

Management recommendations

- Avoid grading, damming, deepening or infilling watercourses.
- Avoid excessive abstraction of groundwater from watercourses. Minimise water use by implementing "best practises", e.g., drip irrigation. If possible, store water in winter (in the winter-rainfall region) rather than pumping in summer.
- Do not create any permanent structures below one-in-fifty year flood lines, and as few as possible below one-in-one hundred year flood lines.
- Do not store hazardous materials, including chemicals, fertilizers and fuel, near watercourses or on floodplains.
- Do not create waste dumps within watercourses or on floodplains.
- Provide special protection to all wetlands and reedbeds on floodplains, because they will help to slow down flash floods and reduce the damage they cause.
- Do not allow large quantities of waste, fertilizers and silt to run directly into watercourses; create ditches or swales to receive and filter polluted runoff.
- Consider how farming practices in catchment areas may be improved to reduce soil erosion and improve the quality of runoff.
- Set aside an undisturbed buffer zone on both sides of watercourse channels; this should be at least 30 m wide, but preferably 50 m or more. Buffer zones help to protect watercourses against polluted runoff, and provide sufficient space for the development of riparian vegetation. The wider the buffer zone, the more effective the watercourse will be as an ecological corridor with a variety of habitat types suitable for a variety of plants and animals.
- Allow natural, indigenous vegetation to grow up on the banks of watercourses. The health of rivers and streams is largely dependent on the condition of the riparian vegetation on the banks. This vegetation stabilizes the banks, filters incoming runoff, shades

The Heuningsnes River with a wide a strip of natural vegetation along its course. The farmers bordering on this river have formed a Riperian Association. Photo: Donella Young.

the water and keeps it cool, and provides the right kind of organic nutrients, mainly in the form of leaf litter, to sustain aquatic life.
- Control and eradicate alien vegetation from watercourses. Alien shrubs and trees tend to flourish in watercourses and prevent the growth of indigenous species. Dense stands can cause watercourses to dry up and become inhospitable to many types of animals. Aliens are also less reliable at stabilizing banks than indigenous vegetation.
- If you wish to rehabilitate or modify a watercourse, consult experts, such as the Mondi Wetlands Trust (*www.wetland.org.za*), for advice.

Benefits to the farmer

- Improved water quality downstream, and in dams.
- Good relations with downstream neighbours!
- Recharged groundwater.
- Protection against erosion and flash floods.
- Natural beauty and rich wildlife.

8. Protect breeding and roosting sites

Animals usually spend most of their time looking for food, and therefore we tend to be most aware of their foraging habitats. However, just as important to the survival of animals are the places where they rest and breed. For many animals, these are places where there is dense cover and/or where there is protection provided by water. This means that areas of natural bush, watercourses and wetlands all tend to be of particular importance to a wide variety of animals, even those that do not forage in these habitats (see discussions above).

The breeding period is the most vulnerable time, not only for babies and juveniles, but also for adults. Disturbance of a breeding site can cause a pair of breeding birds to abandon their nest. Excessive disturbance or insufficient food can cause the milk of suckling mothers to dry up.

Management recommendations

- When a breeding site is known to the landowner, it should be protected from disturbance – not only human disturbance but also

Blue Cranes always roost in wetlands, which may include dams or rivers. Photo: Wicus Leeuwner.

predation by domestic cats and dogs, and trampling by livestock.
- Protect areas of dense natural vegetation and allow natural vegetation to grow up around wetlands and dams.
- If reed beds need to be burnt, this should be done outside of the breeding season of birds such as the Grey Crowned Crane and Wattled Crane.
- After the chicks of cranes, bustards and korhaans have hatched and left the nest, they are very vulnerable until they are able to fly. Avoid disturbance which may lead to young birds running into fences and breaking limbs.
- Educate farm personnel and their children not to catch crane chicks to keep or sell as pets.
- Protect trees, even alien trees, which are obviously important as roost or breeding sites for birds. Tall gum trees, for example, are sometimes used as roosts by large numbers of such threatened species as the Lesser Kestrel.
- Consider erecting nest boxes for desirable species, such as owls.
- Create islands in dams to encourage breeding of waterfowl.

Spotted Eagle Owls bred successfully in a nest box. Photo: Donella Young.

Benefits to the farmer

- Large bird roosts often provide great spectacles which help to attract eco-tourists.
- Breeding animals are always of special interest to eco-tourists.
- Successful breeding of wild animals provides a good indication that management is appropriately "green" and is of benefit to farming and conservation by increasing biodiversity.

9. Manage fire appropriately

Fire is a natural phenomenon in many parts of South Africa, and, to varying degrees, ecosystems are adapted to recover after fire. Some ecosystems, such as fynbos and grassland, require periodic fires to rejuvenate the veld and maintain biodiversity. However, the frequency of fire is often greatly influenced by human activities, with the trend usually being toward too frequent burning. Excessively frequent burning causes a loss of biodiversity because some plants are not able to set seed before the next fire, and some animal populations are not able to build up their numbers through breeding and/or immigration from neighbouring populations.

The landowner needs to become familiar with the burning regimes that are recommended for the veld types on his land, and build fire management into the overall management plan for the veld.

Management recommendations

- It is highly recommended that landowners join their local Fire Protection Association (FPA), if one exists, or form one for assistance in complying with regulations.
- Owners should ensure that firebreaks are positioned and prepared in such a way as to cause the least disturbance to soil and biodiversity. A sensible width for firebreaks in

fynbos is no more that 10 m.

- Where possible, threatened species of plants should be transplanted, or firebreaks sited to avoid them.
- Do not deliberately burn veld types that do not require it. For example, "strandveld" which occurs up to 8 km from the coast, does not require burning.
- No fire should be permitted in fynbos until at least 50% of the population of the slowest-maturing species in an area have flowered for at least three successive seasons. This results in a recommended frequency of 12–20 years for fynbos, depending on the area's rainfall. In grassland areas, the recommended frequency of burns is 5–9 years.
- No fire should be permitted in Renosterveld if the vegetation is shorter than 50 cm and doesn't have mature bushes from a number of different species.
- Alien vegetation can increase the intensity and temperature of fire to levels that damage the soil and seed banks in the soil. Alien vegetation should, in most cases, be removed prior to veld burning. (Detailed advice can be obtained from CapeNature or other provincial nature conservation agencies, or from the Working for Water programme at *www.dwaf.gov.za/wfw/*)
- Burn in the recommended season. Generally, a late summer or early autumn burn is best for fynbos species, but the risk of run-away fires means that burning is usually only feasible in March and April. In grasslands, winter or spring burning (June–September) is recommended.
- Do not burn stubble fields while Blue Cranes are breeding in them.
- It is highly desirable to maintain a mosaic of different vegetation ages within a property. Where the area of indigenous veld is large enough, this is achieved by means of "block burning" in different years.
- Ensure fire fighting equipment is maintained and in good working order before the start of each fire season.
- Keep accurate records of fire. Note areas, dates, weather conditions, etc.
- Guard an extinguished fire for at least two days after a burn.
- Do NOT allow livestock to graze natural areas in the first flowering season after a fire. This is so that bulbs and annuals have a chance to flower and set seed before being grazed.
- See the Useful Contacts section.

Benefits to the farmer

- Members of FPAs can pool resources and are assisted in combating fires on their properties. The main advantage of an FPA is that no presumption of negligence can be used in civil proceedings due to fire damage if you belong to an FPA and comply with its regulations, even if the fire started on your property.
- Appropriate fire management helps to ensure vigorous and healthy veld.
- Healthy veld ensures clean water in watercourses and dams.
- Measures to prevent uncontrolled fires help to prevent tragic accidents and loss of property.
- Block-burnt veld provides the floral variety that is most attractive to ecotourists.

Find out the most appropriate way of managing fires for your region and vegetation. Photo: James Harrison.

10. Control dogs, cats and livestock

Dogs and cats can have a huge negative impact on the breeding success of large terrestrial birds, and many other creatures. Cats, especially, catch a variety of small creatures, such as lizards, frogs, mice and small birds, and thereby reduce populations of these creatures, and may even cause them to become locally extinct. Domestic cats may also interbreed with the African Wild Cat, *Felis lybica*, causing a genetic weakening of the wild population. Farm employees' cats and dogs are potentially an even greater problem because they tend to be more numerous.

Free-ranging livestock can do much damage to natural habitats through overgrazing, trampling and, in the case of pigs, predation on nests and small animals. Goats can be very damaging to shrubs and small trees.

Management recommendations

- Landowners should ensure that their pets do not roam freely into areas where birds are breeding or roosting.
- Livestock should be restricted to those areas where they are intended to graze and should be kept out of areas that need protection.
- Feral cats, dogs and pigs (i.e., pets that have become wild) should be ruthlessly eradicated (but not with the careless use of poisons – see above).
- Discourage farm employees, as strictly as possible, from keeping large numbers of pets.
- Avoid keeping cats – they are destructive.

Benefits to the farmer

- Elimination of roaming, feral animals will help to control the spread of animal diseases.
- In the case of feral pigs, elimination will also limit damage to crops.
- Careful control of dogs will help to prevent the horrible attacks on innocent people that tend to happen all too frequently.
- An absence of feral and domestic cats will bring about the presence of a richer fauna of small wildlife.

Avoid over-grazing. Photo: Wicus Leeuwner.

11. Increase awareness of farm personnel

Above: Involve farm personnel in conservation activities to increase awareness and interest. Photo: Wicus Leeuwner.

Above: This crane has lost a foot. Encourage farm personnel to remove all pieces of twine from fields to avoid this kind of awful outcome. Photo: Wicus Leeuwner.

Increasing awareness amongst farm personnel of the diversity of plants and animals on a farm, and the need to conserve them, holds great potential benefits, because it is the workers who tend to encounter wildlife most frequently on farms and therefore have the potential to be effective eyes and ears for conservation. Landowners with a conservation ethic can be most effective as conservationists by encouraging their staff to protect wildlife and observe the dos and don'ts of good conservation practice. For example, cranes' legs frequently become entangled in bailing twine. If personnel are trained to remove all pieces of twine from the fields, the negative impacts on the birds can be avoided. The responsible use of poisons, and other measures against problem animals, are especially important subjects that farm employees need to understand.

Management recommendations

- Train employees in the correct use of chemicals, especially poisons, and monitor their performance.
- Educate personnel not to unnecessarily kill animals such as snakes, lizards, chameleons, toads, etc.
- Encourage personnel to report their observations of animals, living and dead, to the landowner.
- Do not allow employees to capture and keep wild animals as pets.
- Educate employees not to litter, but to dispose of waste correctly and to recycle, where possible.

This devastating event could be investigated as it was reported by this alert farm worker. Photo: Wicus Leeuwner.

Benefits to the farmer

- A well-informed, well-trained workforce is an asset to any business.
- Properly trained personnel will help to save input costs by avoiding wastage.
- Problems will be reported promptly, and solutions will be more effective.
- Educational input will have a positive impact on the wider community through the families and friends of employees.

12. Collaborate with others

Forming a conservancy does make a huge difference as conservation work can be shared and will be more efficient and effective. Photo by Wicus Leeuwner.

It is difficult for a single farmer to be able to make a real difference to conservation in his/her area. The good done on one farm can too easily be undone on another farm. But, several farmers forming a conservancy to promote sound conservation practice on a number of neighbouring farms, can make a major difference. This is especially true if such groups of concerned landowners bring in experts to help plan effective conservation strategies. There are many expert conservationists who are eager to assist landowners in their efforts – this booklet has the contact details for several of them.

Management recommendations

- Consider forming a conservancy.
- Hold a meeting of local farmers to discuss the idea.
- Consult your local conservation agency or other expert ecologists to get advice on drawing up an environmental management plan for a group of farms.

Benefits to the farmer

- Working together can make a number of the Desirable Dozen easier and more effective, e.g., the creation of corridors, control of feral cats and dogs, monitoring overhead cables and increasing awareness among personnel.
- Sharing ideas and experiences always leads to greater effectiveness.
- The practice of sound land-management policies over a large area will bring about environmental benefits for the area as a whole, and these are likely to lead to economic benefits in the long term.

Species Accounts

Blue Crane *Anthropoides paradiseus*

The gorgeous Blue Crane is South Africa's national bird – a fitting honour for such a graceful creature. It is also one of the largest birds in the region, and a species that is utterly dependent on the goodwill of private landowners, especially farmers.

Habitat and distribution

The natural habitat of the Blue Crane is open grassland and grassy Karoo veld. It prefers relatively short grass through which it can easily stride with its long, bare legs, and forage for food on the ground. Treeless habitats allow the birds enough room to take off and land, and provide uninterrupted views suitable for a species that must be wary of approaching predators on the ground and in the air.

At night, Blue Cranes usually return to a preferred roosting site. This is often a shallow vlei or shallow dam where the birds can stand together in the water, relatively safe from predators. Early in the morning, they disperse again to open grasslands to forage.

In the past, the species was largely restricted to the Grassland Biome of South Africa, and was therefore most common in KwaZulu-Natal, Mpumalanga, Free State, Gauteng, northern Eastern Cape, and the eastern parts of the Karoo in Northern Cape. However, the Grassland Biome is under severe threat in South Africa. Vast tracts of this vegetation type have been transformed by agriculture, forestry, mining and urban development. This is the primary reason for the decline of the Blue Crane within its former distribution range. However, the species has shown itself to be highly adaptable by learning to exploit croplands, which are, in fact, artificial grasslands. For this reason, the Blue Crane is now more common in the south-western Cape than anywhere else in the country, although it originally hardly occurred in this region at all!

Movements

Blue Cranes flock together during the winter non-breeding season, and are also quite nomadic at this time. However, there is little evidence of long-distance movements; such movements are probably rare and not regular in most areas.

Do look out for colour rings on cranes' legs. The SA Crane Conservation Programme is marking individuals with particular ring combinations in an effort to discover more about crane movements. Record the colour-ring combinations on each leg, recording right and left legs as if you were the crane. Report your sightings to the SA Ringing Unit (SAFRING) at the University of Cape Town (021-6502421).

Photo by Wicus Leeuwner.

Breeding

During the breeding season (August to April), the birds pair off and choose a breeding site.

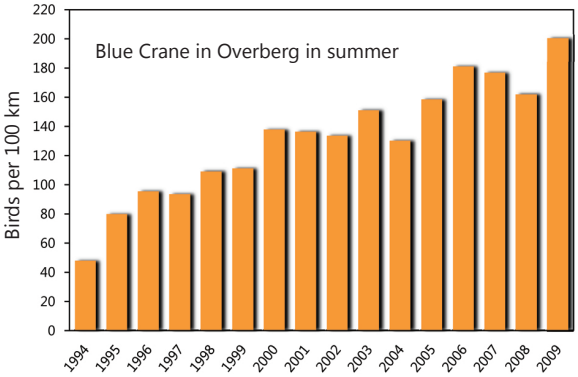
Spectacular "dances" take place before and during the mating period. The nest is a simple scrape, on dry ground or in a marsh. The parents take turns incubating the eggs, which takes approximately 30 days. There are usually two chicks in a brood. They leave the nest shortly after hatching, but are fed by the mother for the first two weeks. Chicks stay close to their parents until the next breeding season.

Diet

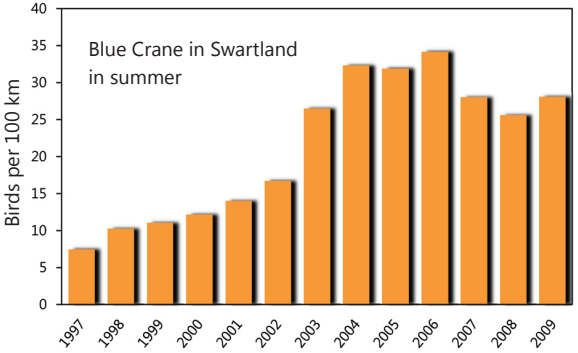
Blue Cranes eat both plants and animals. Plant matter is usually in the form of seeds, but seedlings, soft leaves, roots and bulbs are also eaten. Insects are pecked from the ground, and also small vertebrates, such as lizards and frogs.

Farmers are sometimes concerned about the degree to which Blue Cranes feed on newly-sown seeds and young seedlings in their croplands. It is true that they will take this food when there is little else available. However, CAR surveys show clearly that Blue Cranes generally prefer to forage in fields of stubble (the remains of harvested crops) or in pastures. In pastures, they will exploit feed that has been put out for sheep or cattle, especially in winter. Blue Cranes hardly ever enter fields of tall grain.

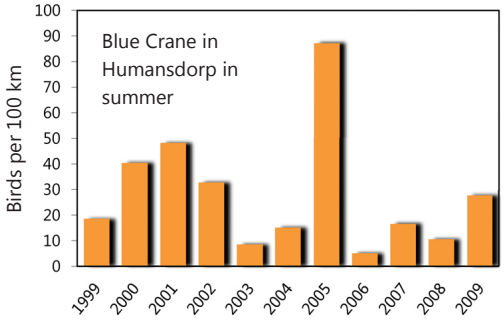
Flocks of Blue Cranes sometimes congregate at feedlots for sheep and may consume significant amounts of feed. Farmers who are concerned about this, or by damage to germinating crops, should experiment with ways to scare off the birds from those specific areas, without causing them harm. Farmers who have success in this regard should pass on the information to CAR or EWT's SA Crane Conservation Programme so that the advice can be shared with other farmers. In some areas field officers have gas cannons that are available for the short period while germinating crops are vulnerable. (Contact the Programme on 011-4861102 or



Blue Crane numbers in the Overberg, in summer. The counts show a three-fold increase over a 16-year period. The Overberg now has the highest densities of Blue Cranes in South Africa (and the world!).



Blue Crane numbers in the Swartland, in summer. The counts show a three-fold increase over a 13-year period. Although Blue Crane densities are still much lower in the Swartland than in the Overberg, the Swartland population appears to be increasing at an even faster rate. This may be because Blue Cranes moved into the Swartland relatively recently, and there is plenty of room for new birds to feed and breed. Alternative interpretations could be that birds are moving in from the Overberg, or that breeding success is greater in the Swartland. Possibly both! (Explanations for the observed trends are speculative at this stage.)



Blue Crane numbers in the Humansdorp precinct, in summer. No consistent trend is apparent over an 11-year period. This suggests that, unlike the Overberg and Swartland populations, the Blue Cranes in the Humansdorp region are more nomadic, moving in and out of the region as conditions become more or less favourable. While all Blue Cranes are more-or-less nomadic during the non-breeding season, the birds in the Swartland and Overberg appear to stay within those regions during the breeding season, but not so in the Humansdorp area. The same appears to be the case in the Little Karoo.

crane@ewt.org.za.) Flapping chevron tape has also proved effective.

Threats and conservation needs

The Blue Crane is a Threatened species (status: Vulnerable) because of steep declines in population numbers in grassland habitats.

The main threats to Blue Cranes that live on farmlands are:

- **Poisoning**, especially from poisoned seeds.
- **Collision** with overhead power and telephone lines, especially where these are situated near to roost sites.
- **Entanglement** with fences, baling twine, etc.
- **Drowning** of chicks in water troughs when trying to drink.
- **Disturbance** of nests and chicks by dogs and humans.

Photo by Wicus Leeuwner.

The most important things a farmer can do for the Blue Crane are:

- **Tolerate** these magnificent creatures on his/her lands.
- **Use poisons responsibly** so that they do not pose a threat to the birds.
- **Prevent disturbance** of nests and roost sites, especially wetlands.
- **Prevent chicks drowning** in water troughs by placing bricks or rocks in troughs.
- **Monitor areas under overhead wires** for carcasses and report dead birds to Eskom-EWT Strategic Partnership on 0860111535.
- See the **Useful contacts** section of this booklet for further advice.

Fortunately, most farmers in the Western Cape are concerned about the Blue Crane, with the result that populations of the species are growing steadily in both the Overberg and the Swartland. In the Little Karoo areas, local population trends are less clear.

Black-headed Heron
Ardea melanocephala

The Black-headed Heron is a large member of the heron family. It is seen away from water more frequently than other herons, including its close relative, the Grey Heron. It is for this reason that it is included here amongst other large, terrestrial birds.

Habitat and distribution

This heron is common and widespread but is often overlooked because it is nowhere abundant and is usually solitary when foraging. Also, it can be difficult to spot when standing dead still in grass. Black-headed Herons usually forage in open, grassy habitats, hence their association with farmlands where they are often seen stalking prey in fields. The distribution of the species is probably limited mainly by the availability of suitable sites for breeding and roosting.

Black-headed Herons gather in numbers to roost and breed, along with other heron species and colonial waterbirds such as cormorants and ibises. Mixed colonies of breeding herons and other species are called "heronries". Heronries are usually in tall trees or in reed beds, often in locations surrounded by water, such as on an island in a dam.

Photo by Johann Solomon.

Movements

Black-headed Herons are not known to be migratory, but as with many other birds, they are nomadic in response to changing conditions. For example, if a heronry is destroyed by fire or flood, they will search for a new site which may take them out of their previous home range. Seasonal abundance of food will also cause them to change their routine.

Every day they move between their regular roosting site and their foraging grounds. This may be a distance of several kilometres.

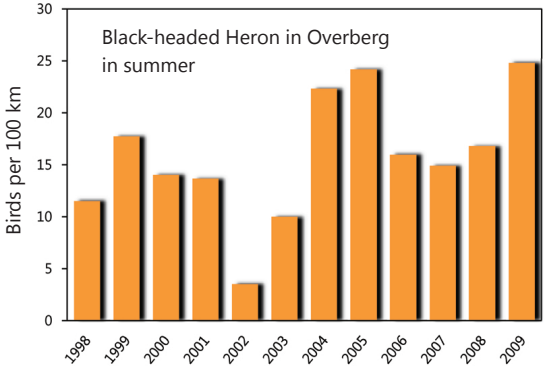
Breeding

As mentioned above, these herons breed in colonies called "heronries", along with other large waterbirds. The nest is an untidy structure of twigs, and many nests can be crammed into a small area, just out of pecking range of each other. Two to four eggs are laid, but the number of chicks successfully raised is usually not more than one per brood. In the Western Cape, the breeding season is extended, beginning in mid-winter and continuing well into summer.

Diet

Black-headed Herons are not specialized hunters of fish and frogs, as are Grey Herons, Purple Herons and Goliath Herons. Although they are quite capable of catching fish and frogs, and sometimes do, they usually forage in grassy habitats. In this respect they are more

Black-headed Heron numbers in the Overberg, in summer. The overall trend appears to be stable, but with marked fluctuations. This may be the result of large differences in breeding success in different years. Temporary conditions, especially related to rainfall, can cause major changes in food availability and this, in turn, can affect the numbers of chicks that survive. (Explanations for the observed trends are speculative and remain to be proven.)



similar to the Cattle Egret, but while the Cattle Egret walks actively while foraging for insects, the Black-headed Heron spends a lot of time standing and watching, or walking very slowly. It can afford to do this because it can handle much larger prey than the Cattle Egret. It will take large insects, such as locusts, but it will also take mice, rats, moles, mole-rats, lizards and snakes. Sometimes they will even grab unwary birds, such as doves! They kill their prey with stabs of their dagger-like bill, and swallow it whole.

On farmlands, it may be that these herons make as large a contribution to controlling rodent pests as owls and other birds of prey. The farmer should welcome them!

Threats and conservation needs

The Black-headed Heron is a common and widespread species (status: Least Concern), but its numbers are limited by a scarcity of suitable breeding sites.

The main threats to Black-headed Herons that live on farmlands are:

- **Poisoning**, especially from poisoned rodents.
- **Collision** with overhead power lines, especially where these are situated near heronries.
- **Persecution** by landowners who cultivate fish in dams.

The most important things that a farmer can do for the Black-headed Heron are to:

- **Refrain from persecuting herons:** There are more effective ways to protect fish from predation and, as explained above, the Black-headed Heron does not usually hunt fish.
- **Ensure that poisons are not used indiscriminately:** There are methods of poisoning which reduce the chances of poisoned rodents becoming available to predators, e.g., place poisoned grain for rodents deep down in their burrows so that poisoned individuals are unlikely to be taken by predators such as the Black-headed Heron.
- **Prevent disturbance** of heronries and roost sites.
- **Create islands and reedbeds** in farm dams to provide nesting sites for herons and other waterbirds.
- See the **Useful contacts** section of this booklet for further advice.

Most landowners in the Western Cape tolerate individual Black-headed Herons, but more landowners need to tolerate and encourage the establishment of heronries where these birds can breed.

Denham's Bustard *Neotis denhami*

Males of this species (formerly known as Stanley's Bustard) weigh in at up to 8 kg, making them among the heaviest flying birds in the world. In southern Africa, the only species that is markedly larger is the male Kori Bustard. Denham's Bustard is a magnificent creature that deserves more attention as a flagship species for ecotourism and for conservation efforts on private lands.

Habitat and distribution

Denham's Bustard is restricted to the moist eastern and southern parts of South Africa, while its close relative, Ludwig's Bustard, is found mainly in the Karoo. The distributions of the two species overlap slightly in some inland districts of the Karoo and Free State.

Being a terrestrial forager, and a large one at that, Denham's Bustard prefers relatively open habitat which it can move through with ease. However, unlike the cranes, it does prefer there to be some bush around, probably because it likes to hide behind cover. The birds are often found on pastures and harvested fields, but usually not far from natural veld. Where they are found in natural settings, such as in Bontebok National Park, they choose areas with low or sparse growth, including recently burnt areas.

Movements

In the non-breeding season, nomadic movements in small flocks are typical. While altitudinal migrations do occur on the escarpments of KwaZulu-Natal, Mpumalanga and Limpopo provinces, this does not appear to be the case in the Western Cape.

Breeding

Most eggs are laid in October and November, in clutches of only one or two eggs. The nest is no more than a scrape on the ground, amongst vegetation that is tall enough to hide the incubating adult. The female is responsible for all incubation and care of the chicks. Nesting females appear to be sensitive to disturbance and tend to abandon a nest if they feel that it has been discovered.

Males put on an impressive display to attract mates. Males gather in a "lek" which is a regularly used display area. This is usually a hillside or flat plain where visibility is good over long distances. The display involves adopting a particular posture and puffing out white feathers of the neck and breast which are normally hidden, creating a striking, bright white "balloon" which can be seen from more than 2 km away. Females choose a male that impresses them, mate with him, and then create their nests within a kilometre or two of the lek.

Diet

Denham's Bustards are omnivorous, eating a variety of vegetable food such as seeds, berries, flowers and shoots, as well as insects and the occasional small vertebrate. These birds are not associated with any significant damage to crops. However, it is natural veld that provides reliable sources of food for these birds, in all seasons, whereas cultivated habitats are attractive only at certain times.

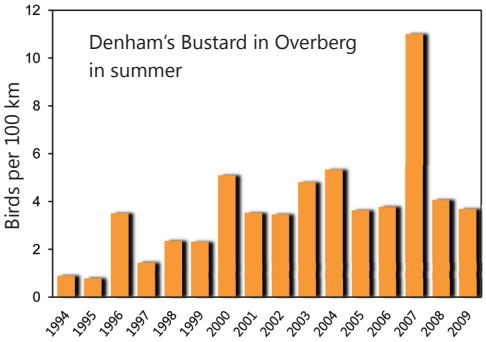
Photo by Wicus Leeuwner.

Threats and conservation needs

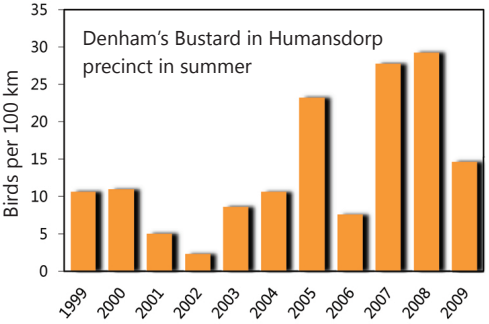
Denham's Bustard is an uncommon species with a relatively restricted distribution range (threatened status: Vulnerable).

The main threats to Denham's Bustards that live on farmlands are:

- **Disturbance**: These birds are wary of humans, and human activity can easily disrupt breeding activities.
- **Collision** with overhead power lines.
- **Hunting and trapping:** Bustards make good eating and have been extensively hunted in the past, but are now protected. Nevertheless, some are illegally hunted or caught in traps set for other species, such as guineafowl.
- **Habitat destruction:** Although they are able to make some use of farmlands, Denham's Bustards are at least partially dependent on the availability of natural veld and are not found in areas where no natural vegetation is left.
- **Predation of chicks by dogs:** It is not known whether this is a frequent occurrence, but it is certainly possible where dogs are allowed to roam without control.



Denham's Bustard numbers in the Overberg, in summer. Numbers are low, but there is an indication of an increase over a 16-year period – perhaps as much as a two-fold increase. A probable factor is a more protective attitude towards these birds on the part of farmers. (Explanations for the observed trends are speculative and remain to be proven.)



Denham's Bustard numbers in the Humansdorp precinct, in summer. Numbers are higher than in the Overberg, but there is an indication of a similar increasing trend. Quite marked fluctuations in numbers, in both regions, suggest that one should be cautious in interpreting these stats, but if numbers really are increasing, it would be a very positive development for this threatened species.

The most important things a farmer can do for Denham's Bustard are to:

- **Preserve** remaining patches of natural veld.
- **Protect the birds** against hunting and trapping, especially by farm workers.
- **Prevent disturbance,** especially in areas where the birds display and nest.
- **Monitor** areas under overhead power lines and report dead birds to the Eskom-EWT Strategic Partnership on 0860111535.
- See the **Useful contacts** section of this booklet for further advice, pages 38–40.

Little is known about where Denham's Bustards regularly breed. Landowners should try to find out if they display and nest on their lands, and inform CAR if they do. Landowners can make a great contribution to the conservation of this species by providing safe, undisturbed breeding areas.

Spur-winged Goose
Plectropterus gambensis

The Spur-winged Goose is South Africa's largest duck (it is actually a duck, not a true goose) and also one of the largest birds in the region with males often weighing more than 5 kg. Along with the Egyptian Goose (also a duck), it has learned to exploit farmlands for food and has become increasingly common on farms in the Western Cape, hence its inclusion in this booklet.

Habitat and distribution

The natural habitat of this species is wetlands, floodplains and flooded meadows. It is in these moist habitats that it normally forages and breeds, but it will also feed in adjacent dry grasslands. Croplands are similar to its natural habitat in many ways, and it is therefore not surprising that it has learned to exploit croplands for food. However, Spur-winged Geese will usually not wander very far from wetland habitat and will usually return to it every night to roost. In the absence of large wetlands, they will sometimes use dead trees, pylons and rocky outcrops as roost sites.

Movements

As with most resident waterbirds, Spur-winged Geese are nomadic in response to rainfall and food availability. In the Swartland and Overberg, their presence on farmlands is most noticeable in winter when they move around in flocks, looking for the best sources of food to prepare themselves for the spring breeding season. In late summer to early winter (in the Western Cape), they gather in numbers at large bodies of water to moult, during which time they cannot fly for about seven weeks.

Breeding

The nest is made on the ground, or sometimes in a tree, in or near to a wetland. Occasionally, nests are made in croplands. Clutches have up to 14 eggs, but the number of chicks raised per clutch is usually much fewer. Incubation takes a month and is done by the female alone. In the winter-rainfall region, egg-laying has been recorded throughout the year, but mainly in spring, August to November.

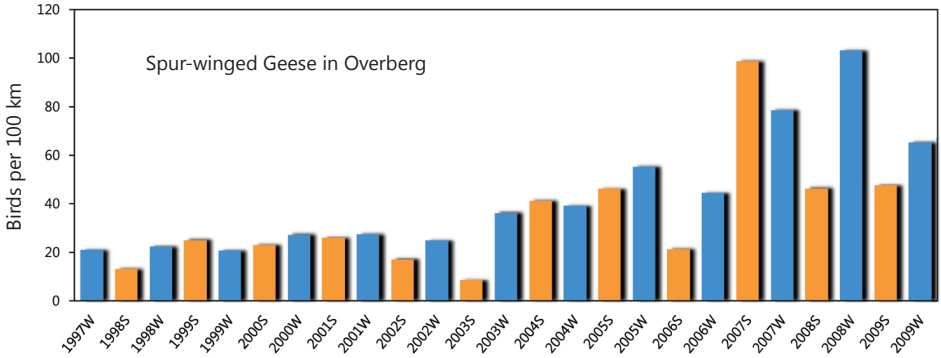
Diet

Spur-winged Geese are mainly vegetarian and will eat grain, water weeds, and fresh grass, including young grain crops. Some invertebrates are also eaten. Like the Egyptian Goose, which usually occurs in much greater numbers, it is capable of doing significant damage to young crops. The amount of harvested grain taken is probably not significant because the numbers of birds are not large enough to have a noticeable impact on the huge quantities of food available. However, there have been reports that trampling of harvested grain by the birds does reduce the yield.

Threats and conservation needs

The Spur-winged Goose is a common and widespread species (status: Least Concern).

Photo by Nico Myburg.



Spur-winged Goose numbers in the Overberg. Summer and winter numbers both indicate an increase over a 12-year period. However, there are also marked fluctuations in numbers, reflecting movement in and out of the region with changing conditions, e.g., relatively wet and dry periods. The increasing trend suggests that this species may be becoming increasingly dependent on crops as a source of food. (Explanations for the observed trends are speculative and remain to be proven.)

It may be legally hunted, with a permit from the relevant provincial nature conservation authority.

The species is not threatened by farming, but, to some extent, it presents a threat to the farmer by damaging crops. As such, the farmer needs to assess whether the damage is significant and, if it is, decide how he will respond. Possible responses are:

- **Tolerance:** The damage may be at a level that is considered acceptable and not worth the effort of control.
- **Scare tactics:** Measures to scare the birds off the lands may include such things as gas canons and ribbon tape that flutters in the wind. Disturbance of sensitive species, such as bustards and cranes, should be avoided.
- **Hunting:** The Spur-winged Goose, as well as the Egyptian Goose, may be hunted with a permit. The birds make good eating and are a suitable quarry for wing-shooting enthusiasts. If numbers on the land are sufficient to provide a sustainable harvest, wing-shooting may help to both control numbers and provide a supplementary income stream for the landowner.

Measures that the farmer should avoid are:

- **Poisons**: Poisoned grain is notorious for affecting non-target species, such as cranes and bustards, and is therefore not recommended. It is also illegal.
- **Damaging wetlands:** The fact that Spur-winged Geese and Egyptian Geese use wetlands can not be an excuse for destroying wetlands. Wetlands are too valuable an ecological resource and scarce a habitat type to destroy.
- See the **Useful contacts** section of this booklet for further advice, pages 38–40.

Farmers have legitimate concerns about the damage done by problem animals, including the Spur-winged Goose. However, the "*boer-maak-'n-plan*" attitude should prevail in finding solutions that are effective, but not damaging to other species or the environment.

Southern Black Korhaan *Afrotis afra*
Karoo Korhaan *Eupodotis vigorsii*

Korhaans are small bustards and share many characteristics with their larger cousins, such as Denham's Bustard. The Southern Black Korhaan is a striking and distinctive species of the Western Cape, while the Karoo Korhaan is less striking in appearance and is typically found in Karoo habitats, but it does also occur in the central parts of the Overberg. Both species have characteristic, loud calls which advertise their presence from a distance.

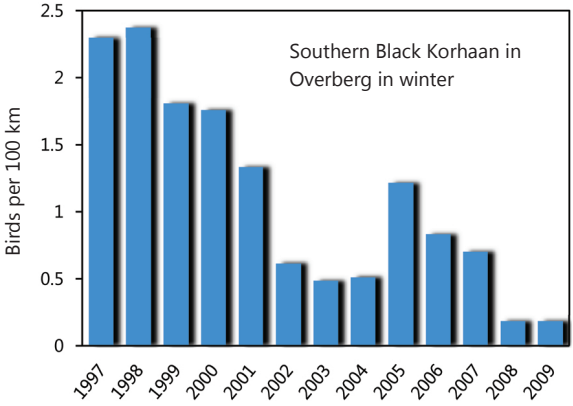
Habitat and distribution

The Southern Black Korhaan is found in habitats along the west and south coasts and adjacent interior. The species is entirely dependent on the natural lowland vegetation of the south-western Northern Cape, Western Cape and south-western Eastern Cape, namely strandveld, renosterveld, fynbos, and, to a lesser degree, succulent and Nama Karoo veld. It is largely restricted to lowlands and does not occur in mountainous or rocky areas. Where suitable habitat occurs on farms, Southern Black Korhaans may be found, but CAR observations show that they rarely make use of croplands and other altered habitats.

A similar-looking close relative, the Northern Black Korhaan, occurs in the other provinces of South Africa in the grassland and savanna biomes of the region.

Because of extensive transformation of lowland habitats for agriculture, the range and population of the Southern Black Korhaan have declined in historical times. On the other hand, the Karoo Korhaan appears to have moved into the Overberg to exploit the more open habitats created by agriculture (as did the Blue Crane), and is usually associated with croplands and pastures in this district. The Karoo Korhaan is unlikely to have occurred in this area originally, but would have been found in the Karoo veld of the nearby Little Karoo. The Southern Black

Southern Black Korhaan, male and female. Photos by Wicus Leeuwner.



Southern Black Korhaan numbers in the Overberg, in winter. There is an indication of a decline over a 13-year period. This species is dependent on natural veld. The decline may reflect a reduction in the amount of renosterveld available in the region, or a decline in the condition of the remaining patches of renosterveld. (Explanations for the observed trends are speculative and remain to be proven.)

Korhaan does also occur in Karoo habitats, but relatively marginally and mainly in transition zones between fynbos and Karoo veld types.

Movements

Korhaans are resident species that do not move long distances.

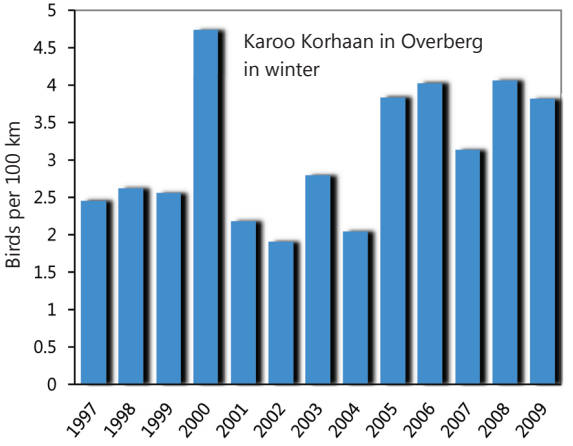
Breeding

Korhaan nests are a mere scrape on the ground, amongst sheltering vegetation. Clutches have one or sometimes two eggs, which are incubated by the female only in the case of the Southern Black Korhaan. Pair bonding takes place in Karoo Korhaans, but not in Southern Black Korhaans.

In the winter-rainfall region, breeding takes place in spring; further east, where rainfall is not clearly seasonal, breeding is in early summer. Male korhaans call and perform display flights to attract mates more frequently during the breeding season. This makes their presence much more noticeable than during the rest of the year.

Diet

As with Denham's Bustard, korhaans are catholic feeders, taking a variety of vegetable and animal food, although they are too small to capture vertebrates larger than small reptiles. It is important to note that, while cultivated fields and pastures sometimes provide an abundance



Karoo Korhaan numbers in the Overberg, in winter. In contrast to the Southern Black Korhaan, Karoo Korhaan numbers, although low, appear to be relatively stable over a 13-year period. In the Overberg, this species lives in open agricultural lands and is therefore not likely to be as affected by any trends in the quantity or quality of local renosterveld. (Explanations for the observed trends are speculative and remain to be proven.)

of food which korhaans are able to exploit, there are other times when they provide nothing that is suitable. Natural veld, on the other hand, always has some type of food to offer.

Threats and conservation needs

The Southern Black Korhaan is a locally common to scarce species, endemic to the Cape Floral Region. While it has the status of Least Concern, it has experienced large reductions in its range as a result of agriculture, especially in renosterveld areas, and further reductions need to be avoided if this species is to be kept off the list of threatened species. The Karoo Korhaan is widespread and relatively abundant in the Karoo.

The main threats to korhaans that live on farmlands are:

- **Habitat destruction** as a result of transformation of natural veld into croplands.
- **Hunting and trapping** for the pot.
- **Disturbance and predation** by dogs and humans.
- **Disturbance and degradation** of veld by livestock.

The most important things a farmer can do for korhaans are to:

- **Preserve** all remaining patches of natural vegetation.
- **Ensure that korhaans are not hunted** on the land, especially not by means of poisoned grain.
- **Prevent excessive disturbance of natural veld by livestock.** (The Karoo Korhaan may benefit from a degree of grazing pressure, but this is less true of the Southern Black Korhaan.)
- See the **Useful contacts** section of this booklet (pages 38–40) for further advice.

Landowners in the Western Cape tolerate korhaans, but many do not realize how important conservation of natural veld is to the survival of these charismatic and typically South African birds.

Karoo Korhaan, male and female. Photos: Nico Myburg.

White Stork *Ciconia ciconia*

Among the species described in this booklet, only the White Stork is a long-distance migrant. Its breeding grounds lie in the northern hemisphere, in Europe. When you see a White Stork, show some respect for this brave and seasoned traveller who regularly completes a round trip of more than 20 000 km!

Habitat and distribution

Most parts of South Africa are visited by White Storks, but the moister eastern and southern parts of the country (including the Overberg) much more so than the drier western parts (such as the Swartland). However, they usually avoid the most tropical coastal parts of KwaZulu-Natal and the Eastern Cape.

White Storks prefer open habitats, hence their liking for agricultural landscapes. As with the Blue Crane, their occurrence in the Overberg is probably a relatively recent phenomenon, in response to agricultural transformation of natural vegetation.

Photo by Nico Myburg.

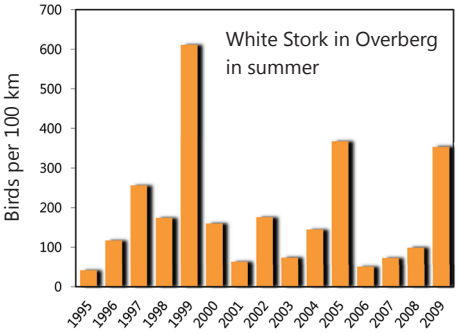
Movements

As mentioned above, our White Storks are migrants from Europe. Rings recovered from birds in southern Africa show that these birds originated in Spain, Germany, the Netherlands, Denmark, Austria, Hungary, Poland, former Yugoslavia, the Czech Republic, Estonia, Lithuania, Latvia, Greece, Bulgaria, Romania, Ukraine, Russia and Israel. A very small population of White Storks has even given up the migrating way of life altogether and breeds in South Africa (a few in the Overberg and a few in the Boland).

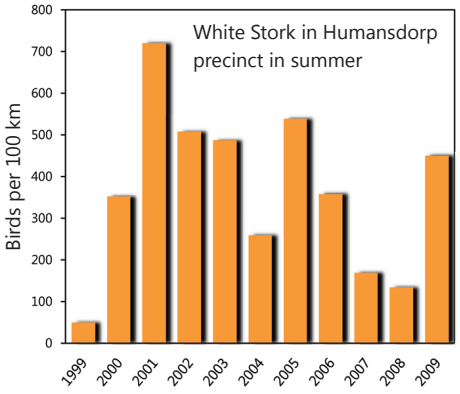
Satellite tracking of migrating birds has shown that they travel over land through the eastern parts of Africa, and cross into Europe via the Middle East. The journey (one way) takes 4–8 weeks, with many "refuelling" stops along the way. Most White Storks arrive in South Africa in November and December and leave again in March and April, but there is considerable variation in the time of arrival because conditions elsewhere in Africa vary from year to year. The time of departure is more definite because the birds need to arrive at their breeding grounds at the right time of year for successful breeding.

Within its non-breeding range in Africa, the White Stork is extremely nomadic, moving to wherever the pickings are good, often being the first to follow behind a ploughing tractor. Food availability is largely dependent on moisture, so rainfall is a major factor in determining movements within South Africa. They are often attracted to sites of temporary disturbance, such as ploughing or fires, because this helps to expose their prey.

Although White Storks are largely absent during our winter, one does occasionally see a bird who appears to have forgotten to migrate. Such birds are probably youngsters, not yet old enough to breed, or birds in poor condition, who are taking a season off to fatten up nicely before making the long flight back to Europe.



White Stork numbers in the Overberg, in summer. The statistics show huge fluctuations in the visiting population. This is fairly typical of species that migrate long distances and opportunistically seek out the best feeding grounds within their non-breeding range.



White Stork numbers in the Humansdorp precinct, in summer. Comparison with the statistics for White Storks in the Overberg shows that the two regions do not show the same pattern. This is what one would expect of a species that moves around in search of the best feeding opportunities, such as outbreaks of caterpillars, locusts and other abundant insects.

Breeding

Fewer than ten pairs breed in South Africa.

Diet

The diet of White Storks should be music to a farmer's ears, because they are largely insectivorous, with a special liking for pests such as locusts, caterpillars and termites. Outbreaks of these pests, especially in the Karoo, sometimes attract many thousands of storks and other birds (including Ludwig's Bustards) which help to control the extent and severity of the plagues. White Storks have been observed to eat six Brown Locusts per minute, per bird! Other pests that they feed on include American Bollworm and African Armyworms. Small vertebrates, such as mice, are also taken.

Threats and conservation needs

The White Stork is a common and widespread species (status: Least Concern), but its numbers are believed to have declined significantly in recent times.

The main threats to White Storks that live on farmlands are:

- **Poisoning,** possibly as a result of chemical control of locusts, caterpillars and rodents.
- **Collision** with, and **electrocution** by, overhead power lines.
- **Hunting and trapping** for the pot.

The most important things a farmer can do for the White Stork are to:

- **Exercise care** and circumspection in the use of insecticides and rodenticides, and adhere to correct procedures when using them.
- **Monitor** areas under overhead power lines for carcasses and report dead birds to the Eskom-EWT Strategic Partnership on 0860111535.
- **Encourage** farm workers to protect and value storks and other wildlife.
- See the **Useful contacts** section (pages 38–40) of this booklet for further advice.

Farmers with outbreaks of insect pests on their lands are encouraged to monitor the response of wildlife, especially large birds such as storks, before taking action. If large flocks of birds move in to feed on the insects, it might not be necessary to apply insecticides, but rather let the birds do the job, for free!

Secretarybird
Sagittarius serpentarius

The Secretarybird is a raptor, like an eagle or a hawk, but a very unusual one, in that it spends most of its time on the ground, and forages on foot, rather than on the wing. It is an exceptionally large bird in terms of height and wingspan, and also quite heavy at around 4 kg.

Habitat and distribution

The Secretarybird is a very widespread species and can be found in virtually any part of South Africa, but is scarce outside of protected areas (status: Near Threatened). The South African population is believed to have declined markedly in historical times.

Open, flat and dry habitats are preferred. In agricultural landscapes, the Secretarybird is associated with rangelands, pastures and croplands that have been harvested (stubble).

Movements

The Secretarybird does not migrate, but it does move around nomadically, sometimes over quite long distances.

Breeding

A monogamous pair sets up a large breeding territory which is usually 50–60 km^2, and defends it against other Secretarybirds. Elaborate courtship displays take place. Both parents build a large nest on top of a tree, usually one of the thorny acacias. Pairs tend to return to successful breeding sites for several years.

Usually two eggs are laid. The female does most of the incubation, which takes six weeks, and the male brings her food to the nest. The young are fed by both parents, and this continues even after the chicks have fledged and left the nest. The fledging period (period from hatching to growth of proper flight feathers) is lengthy at two to three months.

The long period of parental care indicates the importance of a safe breeding site that is relatively free of disturbance.

Diet

The Secretarybird forages by walking steadily through the veld and scanning the ground. It captures most prey with its beak, but larger and potentially dangerous prey, such as snakes, are killed with strong, effective kicks. Prey are also flushed out of cover by stamping on the ground.

The Secretarybird feeds on large insects, especially locusts and crickets, and a variety of small vertebrates, including mammals, reptiles, amphibians, birds and their eggs.

Threats and conservation needs

The Secretarybird is a widespread species, but is uncommon to rare outside of the larger nature reserves, such as Kruger National Park. Its numbers are limited by a scarcity of suitable breeding sites.

The main threats to Secretarybirds that live on farmlands are:

- **Habitat degradation** from overgrazing, bush encroachment and excessive use of pesticides.
- **Lack of suitable, undisturbed nest sites.** Outside of protected areas, this is probably a major factor.
- **Poisoning,** especially from poisoned rodents.
- **Collision** with overhead wires, and **electrocution**.
- **Drowning** in sheer-sided water reservoirs.

The most important things a farmer can do for the Secretarybird are to:

- **Preserve the quality of rangelands** by preventing overgrazing and bush encroachment.
- **Preserve patches of natural veld** which will provide potential breeding habitat for Secretarybirds and other wildlife.
- **Ensure** that poisons for rodents are not used indiscriminately. There are methods of poisoning which reduce the chances of

Photo by Wicus Leeuwner.

poisoned rodents becoming available to predators. (Consult agricultural extension officers or Endangered Wildlife Trust's website *www.ewt.org.za*: select Wildlife Conflict Mitigation Programme, or call their Helpline on 0824634104.)

- **Exercise care** and circumspection in the use of insecticides, and adhere to correct procedures when using them.
- **Monitor areas under power lines** for carcasses and report dead birds to the Eskom-EWT Strategic Partnership on 0860011535.
- **Prevent disturbance** anywhere near nesting sites.
- **Equip** all sheer-sided reservoirs with floating planks or branches to prevent drownings.
- See the **Useful contacts** section of this booklet for further advice.

Predators carry a message about the condition of the land. Predators are indicators of the availability of wild prey. If farmlands are sterilized of all wildlife by transformation of all natural habitats, and the excessive use of pesticides, there will be no food for Secretarybirds or any other predatory species. The presence of predators is usually an indication that natural systems are still functioning, and that the landowner can take pride in his/her stewardship of the land.

For further information about these species and other species monitored by the CAR project refer to the eight-year report: **Big Birds on Farms: Mazda CAR report 1993–2001** edited by D.J. Young, J.A. Harrison, R.A. Navarro, M.D. Anderson & B.D. Colahan. The report summarises the CAR results from counts in six of the South African provinces and is available from the ADU.

Useful contacts

Predators and pests on farms

Donnie Malherbe, **CapeNature** for advice regarding chasing predators or birds off crops or demonstration of chasing devices. ☎ 022-9312900, *gmalherbe@capenature.co.za*

André Theron for **Jackal Chaser**, a solar powered device that makes a loud noise and flashes lights at different intervals to chase jackal, antelope, baboons and birds off crops ☎ 0833382025, ☎ 02062 ask for 1604 Merweville, *asco@mtnloaded.co.za*

Nest boxes: Gerry Cassidy makes owl nest boxes in the Overberg. Owls are very effective in controlling rodents without using poisons that affect the whole ecosystem. ☎ 028-3163412, *gcassi@netactive.co.za*

Oxpeckers, ectoparasites and farmers. A manual for farmers and landowners. *oxpecker@ewt.org.za*

Pest and disease control using environmentally-friendly commercial, home and garden products: *biogrow.co.za*

***Predators and Farmers* booklet** available from Endangered Wildlife Trust ☎ 011-4861102.

Predators on Livestock Farms. 2008. Landmark Foundation by Dr Bool Smuts. Booklet with practical advice regarding methods of chasing off/protecting livestock from predators without harming the predators. Currently out of print, but is being reprinted.

Willi Ekermans for **SunGun One** device, a series of prisms that disorientates and influences the landing capacity of birds. It has also been used to chase away mammals e.g. baboons and small antelope from crops, and jackals from merino sheep. ☎ 0838830778, *innoventek@webmail.co.za*

Wildlife Conflict Mitigation Programme of the Endangered Wildlife Trust (EWT) ☎ 011-4861102. Specific aspects include: responsible problem animal management, problem birds in agriculture management, integrated pest management, responsible use of agrochemicals, national agricultural pest management, farm workers education and awareness, and combating the negative impacts of agrochemical misuse.

Electricity

Powerline collisions: report to Eskom-EWT Strategic Partnership ☎ 0860111535 or 011-4861102 (part of EWT's Wildlife & Energy Programme).

Saving energy: *earthlife.org.za*

Sustainable Energy Africa (SEA): promotes sustainable energy approaches and practices in the development of South Africa and Africa. *sustainable.org.za*

Further useful websites and resources

Alien wattle control: Stumpout available from the Plant Protection Research Unit, Stellenbosch. Contact Gwen Samuels ☎ 021-8874690, *samuelsG@arc.agric.za*

Animal, Vegetable, Miracle: Our year of seasonal eating by Barbara Kingsolver – very informative, inspiring and amusing account about a family who choose to live more sustainably and grow much of their food. *animalvegetablemiracle.com*

Biodiversity and Wine Initiative: *bwi.co.za*

Biodiversity Citrus Initiative Report: *capeaction.org.za/uploads/Report_Citrus_Industry_Baviaanskloof.pdf*

BirdLife South Africa: *birdlife.org.za*

Birds on Farms. Ecological management for agricultural sustainability. Geoff Barrett Supplement to *Wingspan*, vol. 10, no. 4, December 2000. Birds Australia.

Botanical Society of South Africa: *botanicalsociety.org.za*

Cape Action for People and the Environment: *capeaction.org.za* See the section: *Biodiversity Economy*.

Cape Gateway: *capegateway.gov.za/eng/* access to government information and services for citizens of the Western Cape.

CapeNature: *capenature.org.za* Click on *Resources* for useful guides with contact details e.g.: ● *The Landowner and Fire Protection Associations* ● *The Landowner's Guide to Soil in Renosterveld* ● *A Landowner's Guide to Managing Climate Change: Facts, Threats and Solutions* ● *A Landowner's Guide to Managing Biodiversity in an Agricultural Landscape* ● *A Landowner's Guide to Managing an Ecological Approach to Restoration or Revegetation in Rural Landscapes* ● *Guidelines for the Establishment of a Conservancy* ● *You and Environmental Management in the Western Cape* (practical introduction to Environmental Impact regulation in the Western Cape).

CapeNature Stewardship Programme Kerry Purnell *kpurnell@capenature.co.za* ☎ 021-8505266 or Garth Mortimer ☎ 023-3496755.


Wicus Leeuwner

Department of Agriculture: Western Cape *elsenburg.com,* ☎ 021-8085111.

Endangered Wildlife Trust: ☎ 011-4861102, *ewt.org.za*

Guidelines to Conservation Farming is a CD produced by the Dep. of Agriculture. Copies available from Brigitte van den Berg ☎ 021-8085340, *BrigittevdB@elsenburg.com*

Good Agricultural Practices: Department of Agriculture Downloads from CAR webpage (*car.adu.org.za*) available on various topics. Click on *Farming Practices*.

Green Choice: Partnership between World Wildlife Fund and Conservation International that aims to support sustainable agriculture and fisheries production by driving best practices across supply chains. Visit the URL that has **links to best practice in the different agricultural sectors**, e.g. potatoes, rooibos, citrus, ostrich and meat: *capeaction.org.za/index.php?C=bio&P=4,* ☎ 021-7998832, fax: 021-7615462, *info@greenchoice.org.za*

Greenspace: a directory of environmentally preferable products and services available in South Africa. *greenspace.co.za*

Herpetological Association of Africa: *web.wits.ac.za/Academic/Science/APES/Research/MWLab/HAA/Home.htm*

Karoo Landowner Conservation Guidelines Nama Karoo Foundation: *namakaroo.org, info@namakaroo.org*

LandCare Services: ☎ 021-8085111, *elsenburg.com/srm/landcare.html*

Organic farming: *organicsouthafrica.co.za*

Poisoning: Please inform the EWT-WCPG Wildlife Poisoning Report Line: ☎ 011-4861102.

Potatoes South Africa: Sean Ranger ☎ 0832948776, *sean.ranger1@gmail.com*

Presentations: Illustrated talks by Mike Jarvis, *mjarvis@iafrica.com*, on the topics: • waterfowl management and conservation • problem birds in crops • eagles and their conservation on farms.

South African Crane Conservation Programme: *ewt.org.za* ☎ 011-4861102.

South African National Biodiversity Institute (SANBI): *sanbi.org*

South African Rooibos Council: Gerhard Pretorius ☎ 0824502571, *gcppretorius@gmail.com*

Sustainable living: *footprintnetwork.org* helpful in working out how much nature we have, how much we use and who uses what.

Sustainability Institute: in Stellenbosch, works with communities to encourage sustainable living: *sustainabilityinstitute.net*

Vegetables: a gardening method that will use: 67% to 88% less water, 50% less purchased organic fertilizer, while creating a 100% increase in soil fertility! *growbiointensive.org*

Wildlife and Environment Society of Southern Africa (WESSA): *wessa.org.za*

Wetlands: *wetlands.org.za* Mondi Wetlands project that has very practical, illustrated guides to conserving and re-habilitating wetlands e.g. *Wetland Fix Part 6 Alien Plant Control Guide*.

Working for Wetlands *wetlands.sanbi.org/wfwet* See especially the *Resource Centre.*

Provincial conservation agencies: web sites/address	
Western Cape	CapeNature: ***capenature.org.za***
Eastern Cape	Parks: ***ecparks.co.za***
KwaZulu-Natal	Ezemvelo KZN Wildlife: ***kznwildlife.com***
Free State	Dept of Economic Development, Tourism and Environmental Affairs: ***detea.fs.gov.za***
Gauteng	Dept of Agriculture and Rural Development: ***gdard.gpg.gov.za***
Limpopo	Dept of Economic Development, Environment and Tourism: ***limpopo.gov.za***
Mpumalanga	Parks Board: ***mpumalangaparksboard.com***
Northern Cape	Dept of Environment and Nature Conservation: **Christine Pienaar, Private Bag X6102, Kimberley 8300**
North West	Dept of Agriculture, Conservation, Environment and Rural Development ***nwpg.gov.za/Agriculture/***

Report the **breaking of environmental laws:** refer to your local conservation agency or information can be left anonymously at ***capenature.co.za***

Acknowledgements

Many people have contributed their knowledge and experience to this booklet and we have appreciated the way in which this has been generously shared. Through the Coordinated Avifaunal Roadcounts (CAR) project and the Big Birds on Farms (BBOF) project we have interacted with many farmers, conservationists, agricultural businesses, as well as the Department of Agriculture, AgroMet, LandCare, the South African National Biodiversity Institute (SANBI), Cape Action for People and the Environment, BirdLife South Africa (BLSA), provincial nature conservation agencies and the EWT's South African Crane Conservation Programme, Wildlife & Energy Programme and Wildlife Conflict Mitigation Programme.

We are hesitant to use names, as there are too many to include here, but some people have made particularly significant contributions and we would like to thank the following farmers: Wicus Leeuwner, Mick D'Alton, Pieter Albertyn and Stuart McLennan; agriculturalists: Hennis Germishuys, Francis Steyn, Mireille Lewarne and Toni Xaba; conservationists: Mark Anderson, Brian Colahan, Sue Milton, Ingrid Nänni, Kevin Shaw, Jon Smallie, Tim Snow and Jaco van Deventer. We would also like to thank all those farmers who were interviewed and completed questionnaires and those who attended the workshop in the early stages of the BBOF project.

Without all the observers who have taken part in the CAR counts twice a year since 1993, this booklet would not have been possible. They have voluntarily driven many miles gathering the bird and habitat information along bumpy roads through farmlands. About 50% of these counts are conducted by farmers themselves and most by bird club members. Thanks to the members of Cape, Hermanus, Somerset West, St Francis Bay, Tygerberg and West Coast bird clubs, principal and learners of Teslaarsdal Primary School, learners of Laerskool Overberg and J.J. Viljoen NGK Primêre Skool, CapeNature, Western Cape Crane Conservation project, and the Breede River, Groot Vaders Bosch and Walker Bay Fynbos conservancies.

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Donella and James
(July 2010)

Please send us your response to this booklet: email *Donella.Young@uct.ac.za* or complete the questionnaire at *car.adu.org.za*. Thank you!

LANDCARE SOUTH AFRICA

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Animal Demography Unit

CRITICAL ECOSYSTEM PARTNERSHIP FUND

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Everyone depends on Earth's ecosystems and their life-sustaining benefits, such as clean air, fresh water and healthy soils. The **Critical Ecosystem Partnership Fund** is a global leader in enabling civil society to participate in and benefit from conserving some of the world's most critical ecosystems. We provide grants for nongovernmental and private sector organizations to help protect biodiversity hotspots, Earth's most biologically rich yet threatened areas. The **CEPF** is a joint initiative of *l'Agence Française de Développement*, Conservation International, the Global Environment Facility, the Government of Japan, the MacArthur Foundation and the World Bank. A fundamental goal is to ensure civil society is engaged in biodiversity conservation.

SANBI **(South African National Bioversity Institute)** started the Birds and Environmental Change Partnership to focus South Africa's bird research, monitoring and conservation more strongly on the impacts of environmental change drivers, especially climate change and land use changes. The Partnership underwrites citizen-science monitoring projects and long-term datasets and conducts focused research on climate change vulnerability and adaptation.

The **McDowell Trust** for the Protection & Conservation of Fauna and Flora was founded on a bequest made by Dr J.J.H. McDowell, mainly for local application. This fund is devoted in part to saving threatened natural biota and systems as well as select "domestic" categories, within the ecologically well-endowed Fynbos Biome. Conservation has focused on those "Cinderella" lowland Cape Floral remnants most prejudiced by escalating urban and agricultural pressure. The **Trust** vision spans system-to-species-to-individual and also includes some human cultural overtones.

The conservation of natural resources in the Western Cape is vital for the agriculture industry and all inhabitants of the province, who rely directly and indirectly on these resources. The sub programme: **LandCare Services** of the Department of Agriculture: W Cape, concentrates on the conservation of the soil resource, which is the precious foundation of this industry and the key to all life. Our mission is to rebuild, maintain and improve the natural resources in the W Cape by promoting efficient conservation practices.

JAH Environmental Consultancy: striving to find middle ground where both economic and conservation imperatives are acknowledged and become mutually beneficial through appropriate planning.
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The **Animal Demography Unit** (*adu.org.za*) is based at the Department of Zoology, University of Cape Town. The unit curates, analyses, publishes and disseminates information about changes in animal populations to contribute to their conservation. Citizen scientists gather information key to the success of the unit's projects. The Coordinated Avifaunal Roadcounts **(CAR)** project involves many farmers, conservationists and bird club members in counting big birds on farmlands.




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