

**4th BIOTA Training Workshop for Para Ecologists
held at the
Succulent Karoo Knowledge Centre in Kamieskroon /
South Africa**

(27th March – 13th of April 2007)

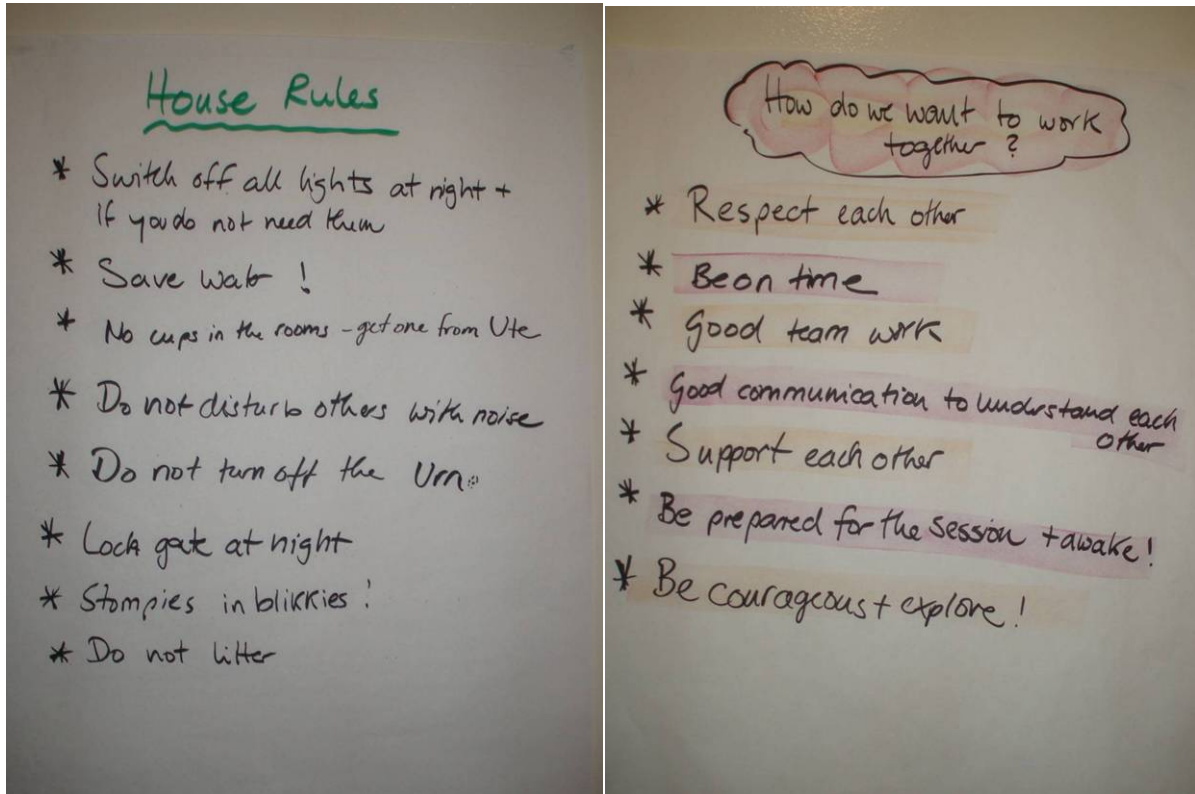


Training has been conducted by
Dr Ute Schmiedel, University of Hamburg / Germany
Bettina Koelle, INDIGO Development & Change / South Africa
Mr Vilho Snake Mtuleni, BioNasc / Namibia
with special contributions by
Annelise le Roux, Succulent Karoo Knowledge Centre / South Africa

Wednesday 28th March 2007

Opening: Facilitated by Bettina Koelle

House rules + How we want to work together?



Energizer: John Wayne and Easter Rabbit:

Exercise which we done for relaxation.

What is BIOTA?

General back ground information about BIOTA South in general and the new developments since 2007 (phase III). Presented with PowerPoint presentation by Ute.

Wetlands in Namaqualand. PowerPoint presentation by Nancy J:

Sharing success +Challenges of previous years:

What was the highlight and what was the low light during the previous year with regard to my work? We make drawings or pictures that showed what happened.



Figure: What I liked... (left), what was challenging (right).

Market in Marrakech. Exercise which we have done for relaxation

How do we communicate?

We have to understand that we do not only listen to what the other person says but that we at the same time see his / her facial expression and body language. Of all parts together we will make meaning. This also means that if we speak to somebody the rest of our body (face, body) is "speaking" at the same time. We have to make sure that our message is understood correctly (the way we want it to be understood).

The right side of the brain which is the side of our feelings and creativity, is controlling the left side of our body (hand/ leg etc.). The left part of our brain, which is the side for rational thinking, controls the right part of our body.

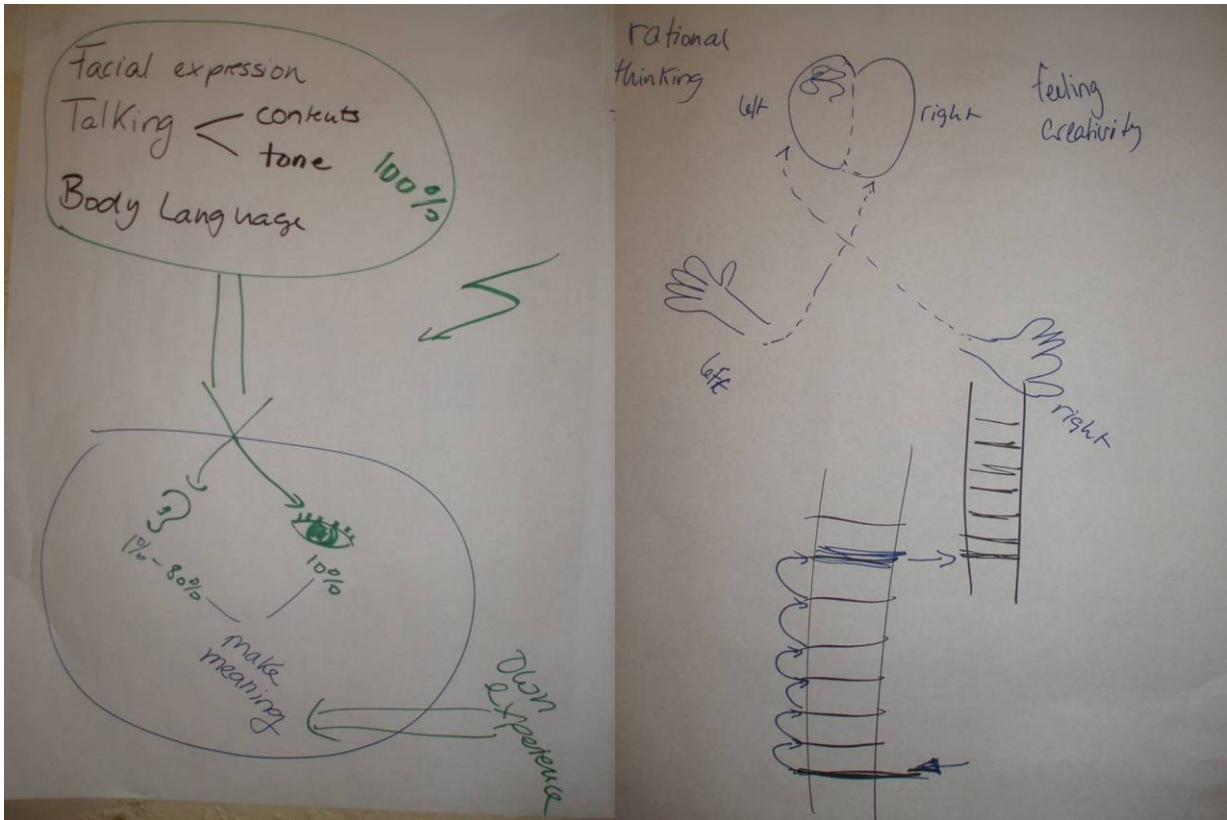


Fig.: Flipchart drawings on perception

Because we not only understand what we hear but also make meaning with many other components of the other person, we easily get involved in misunderstandings. We perceive that we understood what the other person wanted to say (maybe because we already had a bad experience with the person or persons related to this person). We respond accordingly to what has been said, the other person perceives it on her way etc. This is the spiral of misunderstandings or ladder of misperceptions. It is very important to interrupt this spiral if we want to develop a good (working) relationship with the other person. The way to interrupt is, is to always make sure that we fully understood what the person wanted to say and perhaps also why he/ she said it like it.

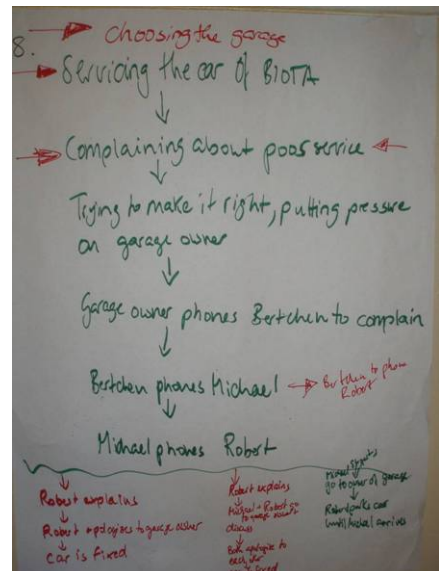
Stories of conflict + Detective

Reginald and Roberth shared with us their experiences where they got involved in conflict with either community members or with researchers. They stopped their explanation at the point where the conflict had developed and we try to develop options how the story might have continued. Afterwards they explained how the story in fact developed.

Reggie's story:

Skeppies Fund \$20.000

Quartz project



Paid in Ute's account (in Reggie name)
Piet buys bakkie (Good friend of Reggie)
Wyks committee calls up meeting with Reggy
Blamed for having used the money for Piet's bakkie

Equipment fare

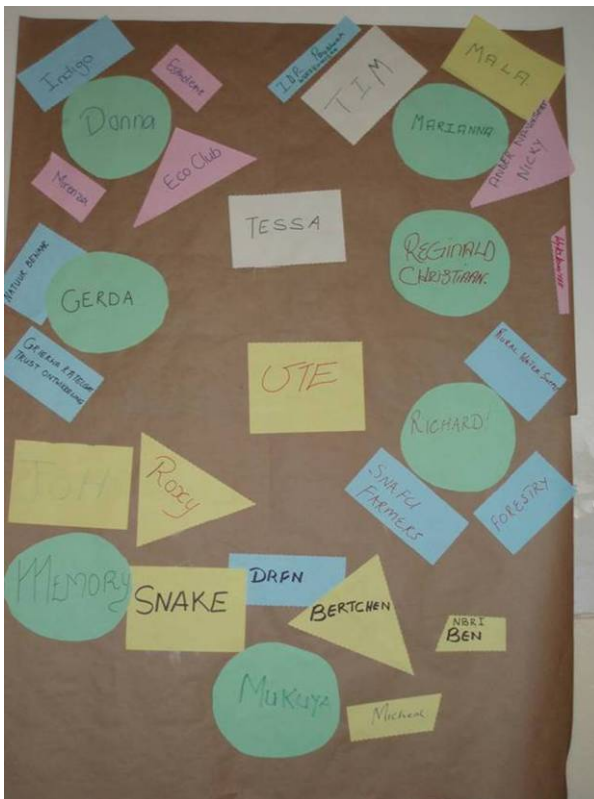
We brought all the equipment that we received to take inventory and receive more instruments and other equipment.

It was fun and great excitement to receive new and modern technologies, on the other side it mean that we have to look after all this equipment. And at the end of the day we have to work very hard because we have been equipped now we have to produce.

Thursday 29 March 2007

Recap of previous day

We repeated the topics from the previous day and evaluated highlights and what should be changed.



Communication Venn Diagramme

In the Venn diagramme we visualized the intensity of communication among the para-ecologists and between the para-ecologists and researchers or other work related contacts around.

Fig.: Communication Venn Diagramme

How to improve communication

We compiled new Cell and Telephone numbers to improve communication between Para Ecologists (see appendix).

What is BIOTA –do your own research

The Para Ecologists prepared presentation and shared with their colleagues the following topics:

- Aim of BIOTA Southern Africa
- What is a PE
- The transect and observatories
- The Succulent Karoo

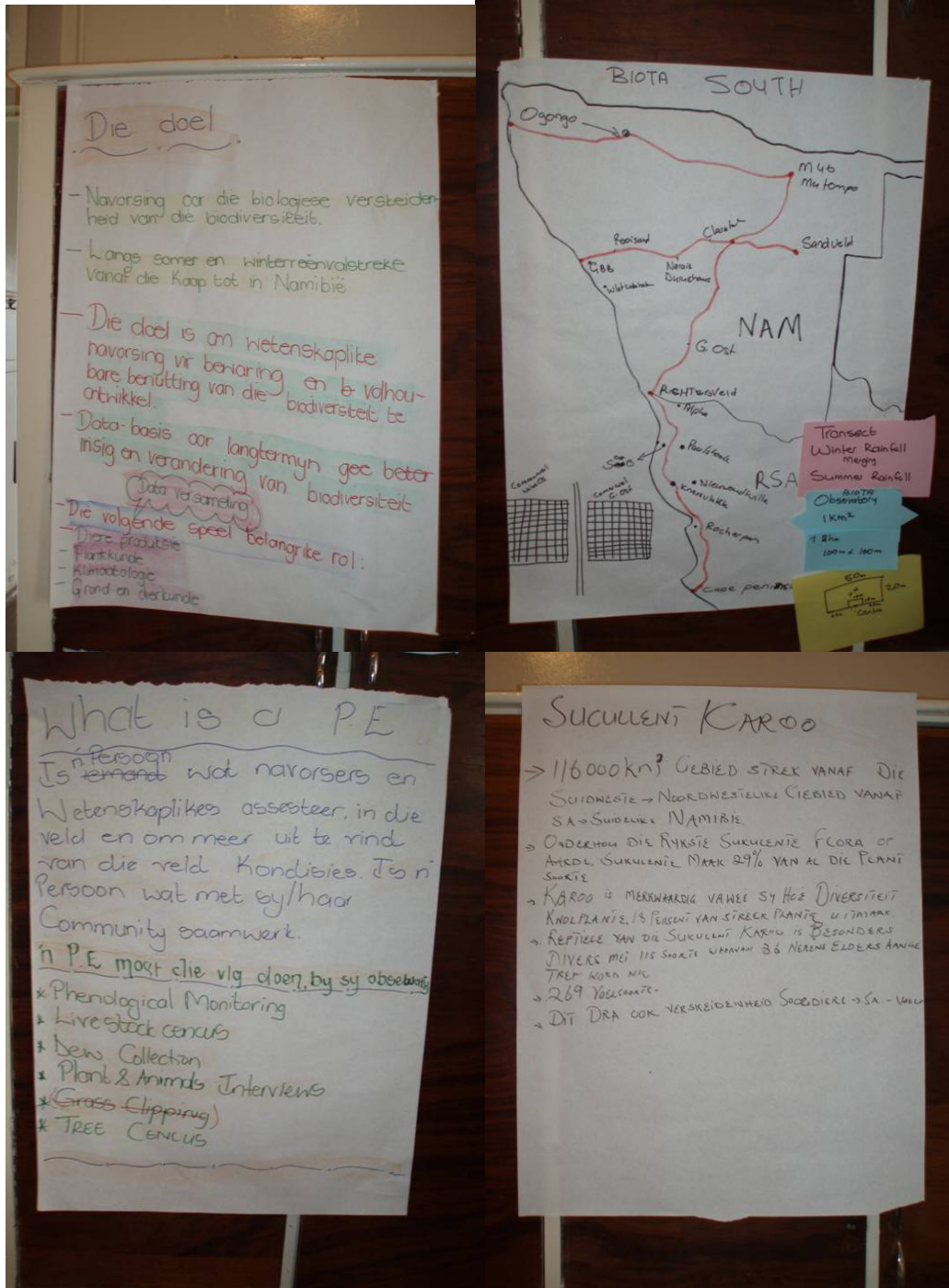


Fig.: Presentations by para-ecologists on different themes

The resource game

The resource game was a game to demonstrate how difficult it is to manage resources in a community sustainably. We harvested marbles ...

Managing your laptop

- Make sure it is safe
- Prevent dust from entering laptop keyboard
- Avoid any dampness
- Clean with a slightly damp cloth
- Look after your laptop
- Do not move your laptop while switched on
- Do not cover ventilation slots
- When near Power Supply remove battery

Energizer. Mad robots

Get together in groups of 3 persons – one person is the operator the other 2 are robots, going mad....

Organize your work

Time

- Ensure you work per contract (on average 40 hours per week)
- Plan your time
- Keep your diary
- Log in your diary what you did- helps with reports

Tasks

- Keep a list of tasks to do
- Monthly planning of tasks
- Be innovative
- Communicate and Network
- Get tasks done!

Reports

- Submit claims for transport etc (if agreed to)
- Submit time sheets every month
- Submit reports (use form!)
- Hand in reports in time

Computer training

We learnt how to save files and had an introduction to Power Point. Everyone made their own presentation as an exercise.

Friday 30th March 2007

Giving and receiving feed back

We repeated what feed back is and what is important when we give or receive feed back (see reader from para-ecologist training 2004) and we made an exercise where each of us gave feed back to somebody of the group we did not talk much to till than.

Energizer with sticks for relaxation.

Handling different types of conflicts:

What can be the source of conflict?

Jealousy (Frustration), Favouritism (Nepotism), Gossip, Misunderstanding (can also be due to different culture), conflict of interests.

Conflicts can be noisy or silent. The latter one is most difficult to deal with because the persons involved might not want talk about it which would be the way towards solving the conflict.

Energizer: circulating planets.

We sat in a circle and let one, later two balls circulate by moving them around on our feet.

Life after BIOTA

What we reach during our contract is very important for our life after BIOTA. It is particularly important to use the opportunities that BIOTA offers to develop your capacities in all fields and also to network with other groups, organisations and researchers that are active in the field BIOTA works or work in your area in order to learn from them but also to advertise yourself (make sure you give them a good impression).

My own project

How far did I get with my own project which I started / planned a year back during the previous training? Were did I get stuck, what were my experiences?

It turned out that is seems to be very difficult to start and carry on a project completely on once own. However, this is an important skill in order to become a professional para-ecologist.

Saturday 31st March 2007

We went to Springbok in the morning to do shopping and bank business etc. We all gave power-point-Presentations on where do I come from?

Sunday 1st April 2007

We went for the day to Soebatsfontein and further to Hondeklipbaai at the coast. It was very nice to be at the cool sea and see the coast and the fishermen.

Monday 2nd April 2007.

What is a Biodiversity Observatory?

It is a standardized biodiversity research and monitoring site where interdisciplinary (by different disciplines) monitoring of biodiversity takes place.

The aim is to

- assess the current state of biodiversity
- understand the processes of changing
- give evidence of changes
- to conduct long-term monitoring in order to be able to pick up changes that happen due to climate change and / or land use.
- use standards to be able to compare among different biodiversity observatories in the world

Biodiversity can be compared with



- weather stations (also measure according to standards, e.g. rainfall)
- star observatories (sterre wag) where people observe the movement of stars and planets in order to understand and become able to predict changes.

Like star observatories, biodiversity observatories can be used for awareness raising (because we understand very well what is going on at that site and can show changes that happened in the past etc.)

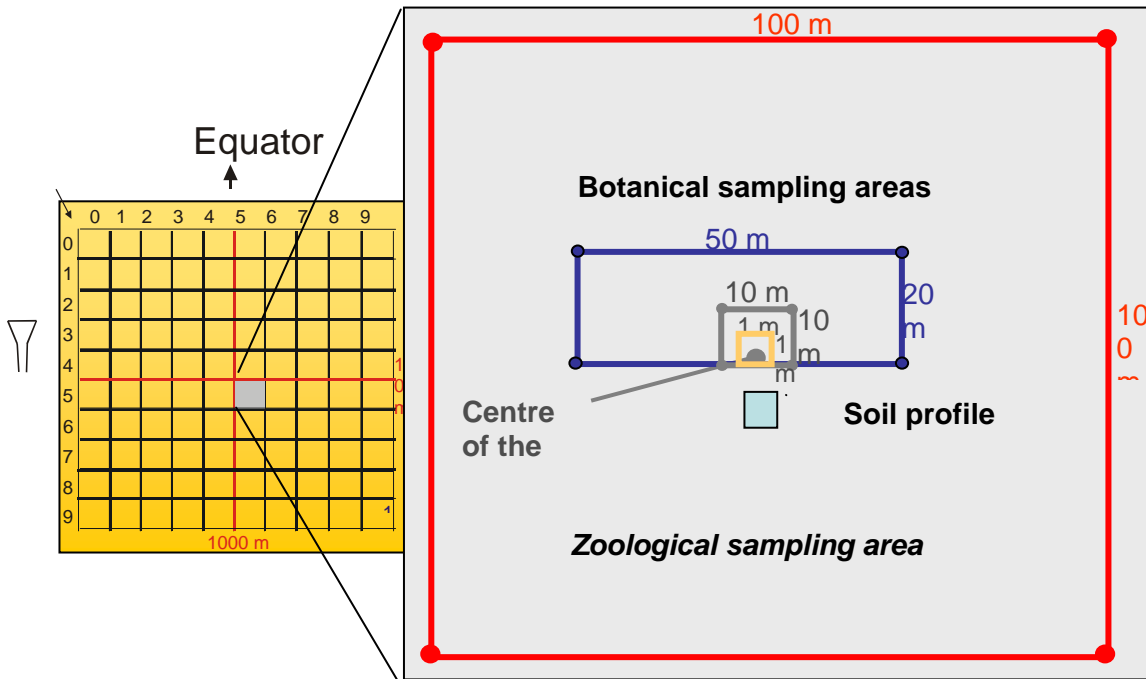
Observatories are put up along a rainfall gradient (also compare information in the readers of previous trainings).

Set up of Biodiversity Observatory

- An Observatory is 1 km x 1 km in size.
 - At many sites there are two observatories next to each other, each representing a particular land use type. Subdivided in a grid of 100 plots of 1 ha in size (i.e., 100 m x 100 m).
- Each ha is numbered from 0 – 99 (beginning in the NW corner)
 - Each hectare is marked with metal droppers and labeled with its number in the NW corner.
 - The hectares are ranked (by a computer programme) from ranking number 1 (most important) till number 100 (least important). The different group work on hectare

ranking 1 to as many as possible other hectares they can work on with regard to man power etc. The botanists work on 50 hectares per Observatory.

- Within the hectare the different disciplines work on different parts of the hectare to make sure they are close to each other and the results can be compared but that they don't disturb each other.
- For the setup within the hectares see figure below.



What is Biodiversity?

Short presentations by participants on the following topics around biodiversity (compare with previous readers)

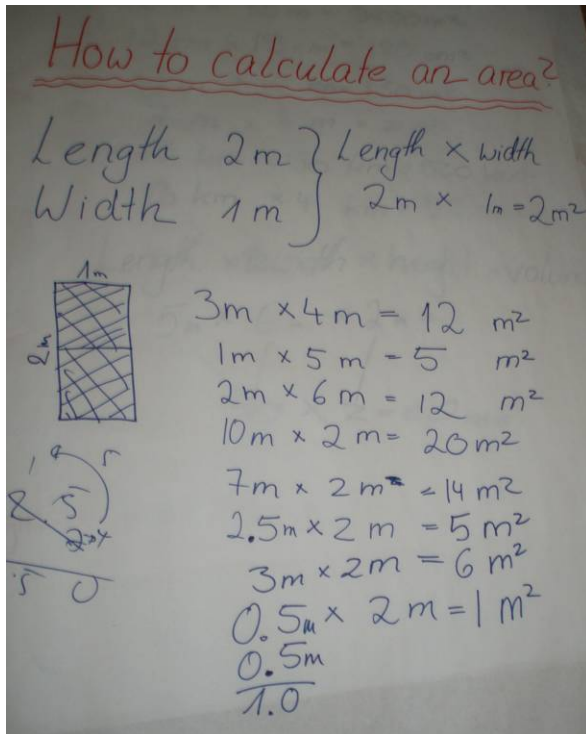
- What is Biodiversity
- What is biodiversity important?
- What impacts / drives biodiversity?
- What is a biodiversity hotspot?

Defined by Conservation International - CI, an US American Non-Governmental Organisation (NGO).

Biodiversity Hotspots are characterised by

- a high number of endemic plant species (more than 1500 species)
- a high degree of disturbance (70 % of the area)

(Succulent Karoo is a biodiversity hotspot)



How to calculate an area

It was a very difficult part of the day, we were getting a little bit confused but in the end of the day we learnt something.

To get the size of an area, you have to multiply the length by the width ($L \times W = \text{area}$)

Fig.: Calculations (examples)

Tuesday 3rd April 2007

Competition of plant species names

We had a competition of who of the para-ecologists knows most scientific (and local) plant species names. The winner was Gerda she knew 44 species names and one genus name. The second winner was Reginald who knew 35 species names and 5 genus names. The winner won a T-shirt of the AETFAT conference in Cameroon 2007. Next time, we will repeat the competition and we expect an even hotter fight.

What is a species and what are scientific species name?

We repeated why scientific species names are used (see below from report in 2004)

What is a species?

- plants / animals / fungi / bacteria etc. of one species look similar: with respect to flowers, fruits, leaves, shape of the plant etc.
- there are however, small differences between young and old plants / animals or plants / animals that grow in different habitats (for instance plants growing in the shade and or in the open sunlight)
- individuals that cross-pollinate or mate with each other successfully under natural conditions

Several species that are closely related form one genus (plural = genera)

Many genera that are closely related form one family (for instance the Aster-family = Asteraceae)

- Different languages have different names for the same plant or animal species
- People in different areas have different names for the same plant or animal species
- Local names do not give insight whether or not the species are related (for instance Soetdoring, Kameeldoring, Swarthaak are all Acacia species but you can't tell from their Afrikaans name)
- Different species often have the same local name (for instance at least two different plant species are called "knoppie-stinkkruid" in the Namaqualand)

Where do the names come from?

It started off with scientists describing the plants (in latin) for instance ("tree with long, dark green leaves and yellow flowers"). Carl von Linné, a Swedish biologist, then suggested about 200 years ago to only use two words to name a plant or animal, one name for the entire genus (see above) and one for the species.

For instance: *Acacia erioloba* = Kameeldoring (Acacia is the name for the genus, there are many species in that genus that have this name. *Acacia erioloba* is the name for the species, only the Kameeldoring is named like that)

Scientific names today either

- describe the species, for instance *Osteospermum* = ("bone-seed") *oppositifolia* ("opposite leaves")
- or are named after the area they come from (*Acacia karoo*)
- or are named after a person (typically biologists) *Welwitschia amabilis* (named after Mr. Welwitsch)

What is a para-ecologist?

Ute gave input on what a para-ecologist is:

Para-ecologists

- are members of local communities where BIOTA works in
- are fulltime employed & trained by BIOTA (Job creation, asset for the communities)
- have no academic background (but may decide to study at a later stage)
- are supervised by a BIOTA researcher

Para-ecologists are not only field assistants!!

Tasks of para-ecologists are

- to support researchers in the field
- conduct work during the absence of the scientists
- multiplier in the community (develop capacities that might be helpful/ useful for the community)
- contact persons in the community (community - BIOTA)
- help to communicate research with land users and vice versa (the needs for research to the researchers)
- similar to para-medics, para-vets, parataxonomists
- are unique!!

Wednesday, 4th April 2007

What is local level monitoring?

A method where the farmers, extension officers or other field workers can monitor livestock condition, fodder availability, rainfall with the aim to determine animal condition and to adapt management practices in time if necessary.

Steps:

Every month look at condition of 25 randomly selected animals (sheep, goats or cattle) and determine their condition (1 – very poor to 5 – very good, compare with pictures in the booklet). Calculate average (of 1-5) for the heard (sum up all single number and divide it by 25). Count number of animals that were very poor (i.e., 1 & 2). Use form for this. If the condition of the condition of the animal is getting poor, look at fodder availability. If fodder availability is good but animal condition poor, the herd might be sick. Measure rainfall every morning after it rained and note figures in form.

Measurements and units

0.1 cm = 1 mm

10 mm = 1 cm

1 m = 100 cm

1 km = 1000 m

-> divide mm by 10 to get centimetre

-> divide cm by 100 to get meters

-> divide m by 1000 to get kilometres.

How does a plant look like? What are the tasks of the different organs?

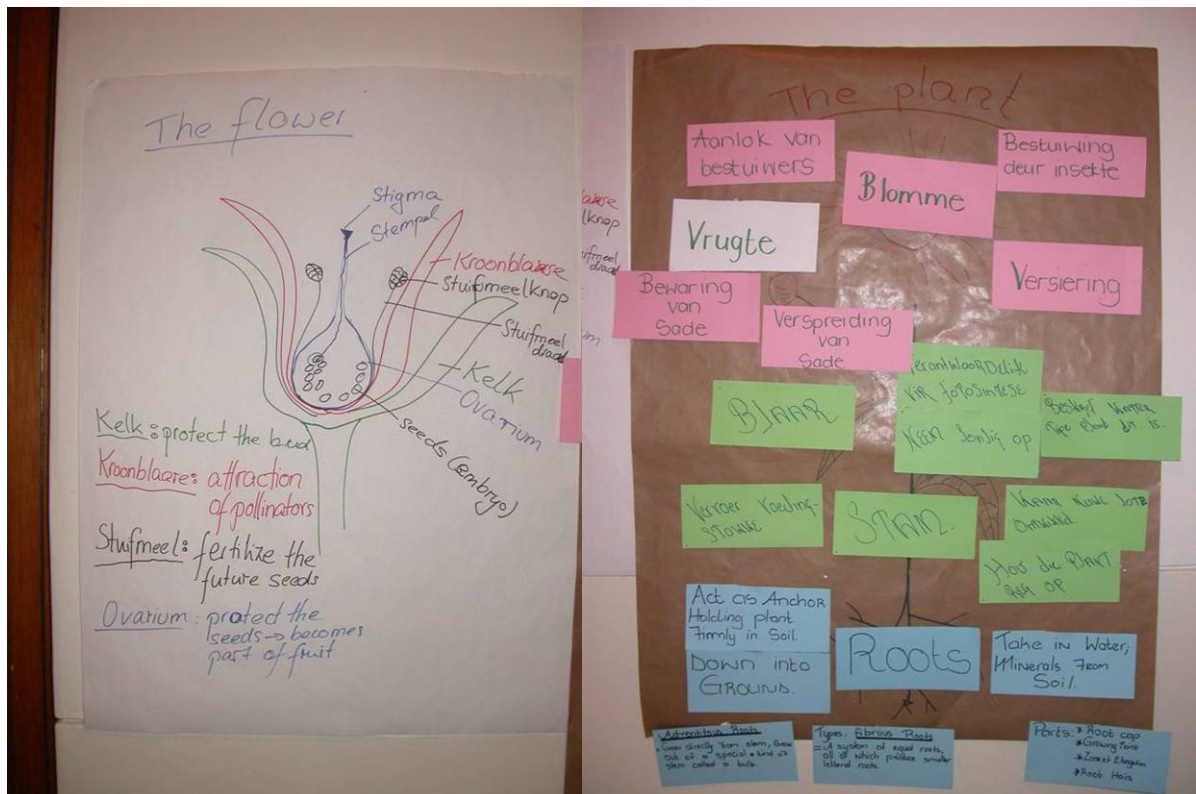


Fig.: Organs of plants and their tasks

Use of GPS (see separate manual)

Thursday, 5th April 2007

What are fungi, algae, mosses, lichens, biological soil crusts?

Fungi (mushrooms, swamme)

Fungi are a group of its own, neither plants nor animals. They can have the shape of a mushroom (with a little stem and a “roof”) but they can also look very different, have all sorts of shapes. The colour can be white, cream, flesh-like, brown, red, black etc. Some mushrooms are edible others are very poisonous. You should know mushrooms very well if you want to eat them.

A big group of mushrooms are parasitic (living on and from other plants or animals). They are often very specialised on a certain host. They often are problematic for humans because they harm their corn and other crops. A typical type of fungi we often see is the mould / skimmel. The parasitic fungi are very small and shapeless, they consist of hyphens (like thread / garn)

b) Algae

Plants that typically grow in water but can also be found outside the water in humid places (like biological soil crusts). They can have all sorts of shapes (from only one cell to big plants), the colour can be green, red, brown, black, etc.).

c) Lichens (Klipbloom)

A lichen is a symbiotic (relationship) between fungi and algae. This two different organisms depends on each other for survival. The algae manufacture its own food by photosynthesis, the fungi on the other hand lives off other organisms.

The lichen is different in appearance from its two components. The lichen adapts to environment in which neither the algae nor the fungi could survive on its own. The algae provide sugar and other food stuff to the fungi. The fungi provide a protective covering and moisture to the algae.

There are about 18 000 known species of lichen, each with its own characteristic shape, size and colour.

Distribution: Lichens have successfully adapted to almost every habitat on earth but they are most abundant where there is often humidity in the air (along coasts, in the mountains). They are often found on rocks or stems of bushes and trees but also on walls and roofs of houses. They can survive without water for a long time but they are only active (photosynthesis, growing etc.) when they are wet.

d) Mosses

Small, primitive (simple) plant that looks like a small cushion. It can be green, grey-green or brown (if it is dry). They can survive without water for a long time but they are only active (photosynthesis, growing etc.) when they are wet. They can typically found on places which are wet at least from time to time.

e) Seed plants

Seed plant is the name for our “normal” plants that surround us and which provide most of our food (grasses, herbs, bushes, trees etc.)

f) Biological soil crust

Is a soil layer on top of the soil surface, which can be removed in pieces.

It can be either formed by components of the soil itself (salt, gypsum) or by biological (living) organisms like fungi, algae, lichens, mosses. Biological soil crusts stabilise the soil and add nutrients to the soil. They can have various colours like brown, black, reddish, whitish, light brown etc.

Calculation exercise: Percent

Percent means “per hundred”. It is used if we want to explain how much of the total (set as hundred) is meant. Example: 100 kids were invited want to go for a soccer game and they decided to all wear the colour of their favourite team (blue). At the game 20 of the kids did not wear blue shirts, that means 20% of the group forget to wear the blue shirt. If there are 200 kids and of them 20 kids forgot the blue shirt than it is 10% of the group that did not wear a blue shirt.

Annelise Le Roux gave a presentation about CREW (Custodians of Rare and Endangered Wildflowers)

Permits

Research permits are a prerequisite (pre-condition) to collect plants or animals or do any experiments with them. In South Africa each province has its own permit office and for the National Parks we have to apply for a separate permit. In Namibia all permits are applied for at the Ministry for Environment and Tourism (MET) in Windhoek.

Permits are specific that means they are issued for a specific group of people, a specific place or area, for a specific group of plants or animals and for a specific duration. Make sure that you always have a valid permit for the area you work in.

Annelise Le Roux gave input on how to take good pictures of plants.

Friday, 6th of April 2007

Field work

We did vegetation relevés on Tantjie Poppies farm just opposite the national road. The plots were 10x10 m in size. We first made a list of plant species that occurred in the plot and then counted the abundance of individuals per species. The second step was to estimate the cover for each species in different height classes: 0-50 cm, 50 -100 cm, 100-200 cm, 200-500 cm. Finally GPS reading and plot photos have been taken.

How to press plants

We collected 3 species per person from the veld and identified it by using photo field guides. Afterwards the herbarium specimen form has been completed (yellow for South Africa and green forms for Namibian) and the plants put into a plant press to be dried.

GPS session II

GPS readings were given on paper and each of us entered two readings into the GPS and used the GOTO command to find the place. This was to learn how to use the GPS to find a special place of which we only have a GPS reading.

Saturday, 7th of April 2007

Produce poster on PowerPoint

We learnt how to produce a poster with MS Power Point and what are criteria for good posters: A poster should give interesting information on a project, place, problem etc. The normal size of a poster is 80 cm x 100 cm.

It should be inviting, make people curious to read the poster and to learn more about the topic, should be readable within 5 minutes and have thus little text but rather pictures, graphs, tables which are briefly explained in the text and have titles, they should be easy to understand. The headline of the poster should be readable from 2 m distance. Below the headline comes the name of the author, his / her affiliation (e.g., BIOTA South), Address.

Quartz fields in Southern Africa. Ute gave a presentation on what quartz fields are and what so special is about them.

The afternoon was for relaxation for all of us.

Sunday, 8th of April 2007

Field trip to Paulshoek. We visited Marianna's family and went to the field where we took pictures of plants and downloaded the weather station.

Slide show

In the evening Ute showed slides from different places in Africa: Morocco, Ethiopia, Kenya, Cameroon.

Monday, 9th of April 2007

Plant families

How to recognise the following six plant families: Asteraceae, Crassulaceae, Euphorbiaceae, Fabaceae, Mesembryanthemaceae, Zygophyllaceae. Technical terms

Annual, perennial, biennial, bulb (geophyte), shrub / struik / bos, tree, succulents, climbers.

Check reader of training 2004 for explanation.

Asteraceae

Growth form: Annual, biennial, perennial herbs, shrubs, trees, lianas, succulents ...

Composed flowers: Head that combines many very small flowers; the central flowers in that head have no flower leaves (kroonblare), the flowers at the fringe often have one long flower leaf (makes the flower head look like one single flower).

The bottom of the flower head (involucre) has characteristic shape for each of the genera

Fruit: 1 seed (such as sun-flower seeds), the seeds often have wings (*Osteospermum*, *Tripteris*) or hair (*Senecio*) or wool (roosmarijn) to make them fly.



Crassulaceae

Growth forms: Herbs, shrubs, small trees, typically succulents

Leaves: simple, roundish or egg shaped

Flowers: 4 or 5 flower leaves, flowers sit in groups or are sometimes solitary (single).

Fruits: small seeds surrounded by four calyx leaves (kelkblare)



Fabaceae

Growth forms: Trees, shrubs, climbers, lianes or herbs

Leaves: typically afwisselnd, pinnate or finger-like

Flowers: typically ship-like (boat with sail)

Inflorescence: in groups (longish or cluster)

Fruit: 2 parts form a pod („bean fruit“)

Seeds: various, often pea-like (roundish or kidney-shaped)



Zygophyllaceae

Growth forms: Herbs or shrubs

Leaves: mostly opposite, simple, forming two sub-leaves (leaflets).

Flowers: 1 or 2 together, (4-) 5 flower leaves (petals)

Fruits: a capsule, often forming 5 parts, sometimes with wings!!



Mesembryanthemaceae (vygies)

Growth form: Annual or perennial succulents, dwarf shrubs, shrubs

Leaves: Opposite, free at base or closely combined with each other

Flowers: single or in groups, flower simple, sometimes having a little pyramide in the centre

Fruits: capsule, mostly woody, open 4 to many „kammers“ when wet

Seeds: kidney-shaped, very small



Euphorbiaceae (Melkbos)

Growth form: herbs, shrubs, trees, sometimes succulent

Leaves: alternate (alternatief), often reduced (very small)

Flowers: male and female in separate flowers, look differently, bracts (special leaves) often sticky

Fruits: typically capsules, roundish

White milk (but also in other plant families!)



Phenological monitoring

How does a plant change over the year?

New shoots are produced and grow. New leaves (look fresh-green, are soft and smaller and are typically found at the top of the branch) are produced, they grow and are shed later (if the plant is not evergreen).

Flower buds become flowers and later fruits, which are first immature (non-ripe), than mature (ripe) and finally disperse the seeds or the entire fruit gets dispersed.

New shoots are growing out of the axle (at the base of the leaf) of a leaf.

Why do we do phenological monitoring?

- to understand the growth of plant, what happens when (in the year) and why (what triggers it)
- What part of the plant is eaten when
- To manage veld by protecting target plants species during a phenological phase when they are particularly fragile (e.g., flowers eaten by goats / sheep).
- To understand impact of climate change on plant phenology.

We repeated how to do phenological monitoring by going through the instruction in group work and reporting back to the group and then did the practical exercise.

Job Interviews

We discussed questions during that are typical asked during job interviews and explained why they are asked. Typical questions that are asked are about

- candidates motivation to apply for the job
- how the candidate would describe himself /herself and what are his / her strongest points and weakest points.
- the candidate's philosophy how to go through his / her life and particularly bad times
- how the project / employer would benefit from the candidates skills etc.
- What kind of working experiences the candidate already had
- How the candidate handled difficult situations and takes responsibility for tasks
- The candidates engagement in the community

Always give good examples and elaborate a bit more on your points than just saying yes or no.

Self-assessment

A form has been handed out which shall help the para-ecologists to think about and discuss the far reaching aim, where they want to be in 3 years (when the contract ends) and which steps can help to reach their goals. The steps can be (self-)evaluated after 8 months (with one evaluation in between) with regard to success.

Tuesday 10th April 2007

Publications in Ons Kontrei and Veld & Flora

Reginald plans to write a little article about the PE programme of BIOTA and asked for contributions from the others on the topics "What is my personal vision for the programme" and "What means the training for me?". The contributions shall be gathered on two flipchart

papers in the hall. Ute would like to use this information also to write an article on the same topic for Veld & Flora.

Plant family competition

We made a competition who recognised first the highest number of plant families of plants on slides. Reginald was the winner with 25 correct and -5 wrong identifications, Gerda was second with 10 correct and -5 incorrect identifications.

Livestock census

Livestock census is the assessment of numbers of stock. We gather stock numbers from farmers that farm on and around the BIOTA Observatories in order to

- understand the impact of land use on veld
- to get background information on the farming system in the surrounding
- to understand economy of farming

We use forms for the interviews that have been explained again (compare with previous years' readers).

Challenges with regard to livestock census: Farmers don't want to give numbers a) because they want to be paid for their time and b) because stock numbers are like bank stats.

Interview farmers about special plants, animals, biological soil crusts

We interview farmers and other knowledge holders about special plants and animals (compare reader from 2005) with the aim to

- facilitated knowledge sharing among farmers
- learn from the farmers which plants are important for them in terms of grazing, medicinal use, building, fire, cultural purposes.
- produce a booklet on that information for the different places for the farmers and their future generations.

There are different kinds of questions in interviews

- a) closed questions (Example: Have you visited the doctor in the past 12 months? Yes / No, if yes, how many times 1, 2, 3, 4-5, 6-10, more than 10)
- b) open questions (Example: What is the most interesting thing about your new job?)

If we do interviews, we have to remember

Before the interview:

- Make appointments
- Explain the reason of the interview
- Bring forms and paper and pen / pencil

During the interview:

- Write notes as detailed as possible
- Be curious, ask further
- Make sure you know which plant / animal species the person is talking about
- Take sample and photo
- Thanks you for the time!!!

After the interview:

Rewrite immediately, make it complete, check Name of interviewed person, date, etc.

How to store photos and other files on your computer

We learnt how to make folders and subfolders in order to store our picture and other files on our computer without losing them.

Wednesday, 11 April 2007

Insects and spiders

How can one distinguish an insect from a non insect ?

- the only invertebrates which have wings.
- they have 3 pairs of legs.
- have pair of antennae.
- the body is divided into three body parts (head, thorax and the abdomen).

Examples of this are: beetles, ants, termites, crickets etc.

Insects are classified into orders and families according to differences in their anatomy. It is therefore important to note the differences in mouthparts, legs, wings and abdominal appendages.

It will be useful and necessary to use a hand lens to see some of these details, particularly in the smaller species.

The colour and general shape are very unreliable features to use when identifying insects.

Before starting to identify the various orders and families of insects, we should of course know which animals are insects and which animals are not.

All the insects belong to a large group Arthropoda that are animals without an internal skeleton, but with a tough skin composed of moveable segments.

Relatives of Insects

Scorpions and spiders are not classified as insects as they lack the above mentioned characteristics. The most distinct one is that they lack 3 pair of legs.

Scorpions have a head and the thorax is not separated and it has 8 legs.

Spiders have a head, thorax not separated and 8 legs.

What role does insects play in life?

Ecological importance.

- they form part of the food chain.
- they break down dead plant and animal materials into organic matter (decomposers).
- well known plant pollinators.
- can be used as an indicator.
- they are used as a biological control agent by farmers.
- they are responsible for changing landscapes.
- they transmit diseases (e.g. mosquitoes transmit Malaria).

Economic importance

- food for human (e.g. honey).
- Pollination of crop plants
- used by Bushmen as a poison for their arrows.

How do people in your community control pest?

- they use chemicals.

NB. > most chemicals are not species selective, in other words they do not only kill the target insects, but also the none targeted once. In a long run this will have environmental problems.

Use of maps

There are different types of maps:

Road maps, street / City maps, topographic maps, aerial photos (ortho photos), satellite photos, thematic maps, tourist maps

We learnt how to use maps by exploring topographic maps (1:150 000) of South Africa.

Soil (= edaphic) features

- a) pH value (acidity – alkalinity) 1 = very acid, 7 = neutral, 14 = very alcalic
- most plant species prefer soil at around pH 7
 - some quart field specialists brow at pH 4
 - Acid soils are fertile because the minerals are more easily washed out at acid soils

b) salt content (salinity):

- salt takes water up and holds water (that is, the plants can't take it up)
- high salt content in the soil reduces plant growth

c) Humus content (organic material like old (dead) plants, leaves etc., dead animals etc.

- provides nutrients for the new plants
- helps to absorb water
- crumb structure (krummelstruktuur)
- helps air can get into the soil

d) Texture (Size of particles and their composition)

- coarse sand: 2.0 – 0.2 mm
- fine sand : 0.2 – 0.02 mm
- silt: 0.02 – 0.002 mm
- clay: 0.002 – smaller
- Loam is a mix of 50% sand, 30% silt, 20% clay.

Properties of different types of soil textures

Properties	Sand	Loam	Clay
Feeling	rough	semi-smooth	very smooth
Formable	impossible	forms nicely	forms nicely
Water holding capacity	Low	good	Very good

Reading graphs

We learnt how to read graphs (compare reader of 2006).

Plant photo competition

We got the results of the competition for the best plant photograph. The first prize went to Reginald with his picture of *Cheiridopsis robusta*, the second prize went to Memory for her picture of *Cheiridopsis denticulata* and Randall got the prize for the most esthetical plant picture. The judge was Annelise le Roux.



Fig.: Prize winning photos by, from left to right: Reginald, Memory, Randall

BIOTA Para Ecologist Contact List

South Africa

(from Namibia dial 00 27)

Reginald Christiaan

Home: 027 6721040 (Mo- Sun 7 am – 10 pm)

Office municipality: 027 6721130

Cell: 072 6942977 (voice mail – check once per week)

Randall Joseph

Home: 027 851 7494 (evenings)

Office Richtersveld Conservancy: 027 851 7082 (Speak to Oom Gert)

Cell: 078 6030770 (only voice mail)

Donna Kotze

Office: 027 218 1148 (Mon- Fr 8.00 – 17.00)

Cell: 083 7449354 (Voice Mail)

Gerda Kriel

Home: 027 2133494 (on weekends after 6pm)

Cell: 083 7408601 (voice mail)

Marianna Lot

Home: 027 5411540 (6 pm – 10 pm)

Office Municipality: 027 5411077

Ute in South Africa

Cell 082 4201458

Ute in Hamburg

Office: 00 49 40 428 16 548

Home: 00 49 40 386 19754

(Phone and Ute will phone back!)

Bettina Koelle

Office: 027 2181148

Cell: 079 5243916

Home 027 2181147

Tessa Oliver

Cell: 083-5183 506

Tel: no office number yet

Namibia

Code to dial from South Africa: 00 264

Memory Dausas

Office Gobabeb 064 694995 (Mo- Fr 8-17.00)

Richard Isaacks

Cell: 081 3079357 (voice mail)

Home: 061 223527 (only weekends or beginning of month or around 25 – payday)

Roberth S. Mukuya

Cell 081 2981672 (voice mail)

Snake Vilho Mtuleni

Cell 081 2326843 (voice mail)

Office DRFN: 061 377504 (leave message)

Bertchen Kohrs

Home: 061 227913 (8 – 10 am)

Cell: 081 293 8085

INSTRUKSIES VIR OLYMPUS 6.0 MILLION PIXELS CAMERA.
REGINALD CHRISTIAAN

- Hou die kamera water vry
- Verwyder enige stof van die lens
- Hou die battery sterk
- Hou die kamera so stil as moontlik
- Kyk vir die regte graad vir n' goeie in fokus foto, regte agter grond
- Moet nie aan die Memory Card onnodig met die hande in aanraking kom nie.
- Moenie die lens venster oop en toe skyf nie.
- Herlaai die battery na elke gebruik

Zoom knoppies

Heel bo - aan die regter kant van die kamera

W - zoom uit

T - zoom in

OPSIES WAT GEBRUIK KAN WORD:

Sorg dat die fokus gesluit is wanneer jy 'n foto neem 'n groen liggie sal flash.

Kies die opsies vir die neem van foto. Scene knoppie aan die bo kant van die kamera

Vir plante bo 50cm gebruik opsie 1+ die plant teken sonder die S - teken aan die linkerkant van die ronde sleutel

Vir baie klein plante - die plant teken aan die linkerkant van die ronde kant van die ronde sleutel, die plant met S -teken - zoom funksie gaan nie werk nie.

Om funksie te deaktiveer -gebruik weer stap een en twee en kies die of(af) opsie.

Wanneer fotos geneem word as die wind waai kies, opsie - 18 -Shoot & Select, 1 of Shoot & Select 2 - gevind aan die linker kant van die kamera onder die zoom knoppies druk OK as jy op dit is.

Om die foto te sien druk die 3de knoppie onder die screen knop een keer 'n groen kaart is langs dit, om uit te gaan druk die knop langs die Power on/of een keer.

Stel van lig:

By die plus minus teken aan die bokant van die ronde sagte sleutel.

Plus en minus gaan verskyn (GEEL van kleur) met plus bo, minus onder, om die lig te verswak gebruik minus, stop by -2 nie geskik by die neem van plante.

Om die lig te verbeter gebruik die plus teken aan die bokant van minus, stop by +2.0

As die regte lig opsie te gekies druk OK in die middel van die ronde sleutel.

Gebruik opsie 0.0 vir enige foto wat geneem word

Om foto's te Erase (delete) kies foto druk die knop aan die onderkant van die ronde sleutel een keer, YES/NO gaan verskyn gaan tot op YES, druk OK.

Om fotos te lock

Gaan tot op die foto druk OK dit is bo, MODE MENU TUSSEN EDIT; calendar gaan na edit gaan na die word play wat aan die linker kant is ,gaan een regs tot op die sleutel,gaan weer een regs off/on gaan verskyn druk twee keer op On n groen sleutel gaan verskyn aan die onder kant van die foto. Om dit te unlock herhaal stap 1 kies Of, druk net eenkeer

Druk die OK knop een keer – gaan na MODE MENU, druk linkes.

Stel van inkomende lig:

Druk die OK/Menu knop gaan na mode menu

Camera,Card, Setup gaan verskyn gaan tot op Setup gaan een links gaan af tot op die screen gaan een links n blou staffie aan die regter kant gaan verskyn + is bo –is onder ,moenie stel as dit nie nodig is nie.

Stel van grootte van fotos

Druk OK/Menu

Gaan na die pyl aan die linker kant van mode menu

Die volgende groottes gaan verskyn

SHQ 2816 x 2112

HQ 28116 x 2112

SQ1-1600 x 1200

SQ2 640 x 480

Gaan na SHQ dit gaan geel word druk OK

Gebruik SHQ vir alle fotos wat geneem word ,die kwaliteit van die foto sal baie goed wees vir beide plant of ander fotos

Die kwaliteit wat gekies word is aan die onderkant van die kamera te sien

Formaat hoe om aktiwiteit aan te bied (Donna Kotze)

STAP 1

- Kry sillabus van elke skool Hoërskool en Laerskool.
- Stel annual programme op waar volgens jy gaan werk.
- Gaan na die skoolhoof en verduidelik hoe jou annual programme by die skool se kurrikulum inskakel en wat is die doel van jou aktiwiteit.
- **BYVOORBEELD**
- Hoekom is dit belangrik om kinders bewus te maak van ons omgewing en die Biodiversiteit.
- Hoekom is dit belangrik om dit te bewaar.
- Tot watter voordeel kan dit vir die onderwysers wees.
- Hoekom dit belangrik is dat aktiwiteite in binne skool ure aangebied word.
- Besluit ook op geskikte datums in die maand.

STAP 2

- Gaan gee presentasie by die skool oor wat jou werk behels en wat is die doel van jou werk en hoekom is dit belangrik.
- Maak seker dat jou presentasie verstaanbaar is.
- Om 'n paar fotos te wys is goed om kinders te win.

STAP 3

- Besluit op onderwerp vir jou aktiwiteit.
- Klassifiseer ouderdom groep sowel as watter graad.
- Hoërskool of Laerskool kinders.
- Maak plakkaat of advertensie met die volgende inligting daarop.
 - Naam van aktiwiteit
 - Datum
 - Tyd
 - Plek waar dit aangebied.

STAP 4

- Doen goeie navorsing oor jou aktiwiteit.
- Volg op met skool 'n dag voor jy die aktiwiteit gaan aanbied.
- Baie belangrik moenie die groepe te groot kies nie, sodat jy seker maak jy het almal se volle aandag en samewerking.
- Besluit watter materiaal jy gaan gebruik om jou aktiwiteit te fasiliteer bv. Flipcharts papier, kaarte, sketse ensovoorts.

STAP 5

- Bied aktiwiteit aan
- Bied praktiese aktiwiteit aan na teoretiese aktiwiteit.
- Gee opdrag aan leerders wat hulself kan doen of in groepe kan werk wat deur die fasiliteerder of onderwyser gemonitor gaan word.
- Daardie taak sal deur die klasonderwyser gemerk en bepunt sal word. Wat ook sal tel vir 'n jaarlikse punt.

GLOBAL POSITIONING SYSTEMS (compiled by Vilho Mtuleni)

1.2 Basic principles

The Global Positioning System (GPS) is a hand held unit, which can determine its location anywhere on the earth.

The GPS is based on a system of 24 satellites orbiting the earth at a very high altitude. To determine a position the GPS must continuously see three to four satellites, which circle, and transmit information to Earth.

1.2 What can a GPS do?

Some of the features that a GPS can perform

Once the GPS is switched on, it automatically gathers information from overhead satellites and then displays its location (position fix) as X and Y coordinates.

The GPS shows the accurate time, and when moving, constantly updates its position and displays the speed and direction of the travel. It serves as a watch, compass and speedometer.

A GPS store a large number of position fixes (waypoints), it can calculate the distance and bearing between pairs waypoints, or between its present position and a waypoint.

It can record precisely the route (track) that is being followed.

In resource survey work, a GPS is an essential tool for making new maps of ground features (e.g. water points, villages roads etc.), or for locating them on existing maps or geo-referenced aerial photos.

Similarly, a GPS a GPS can be used to navigate to ground features whose coordinates have already been determined from a map or geo- referenced aerial photo.

1.3 Introduction to Garmin GPS 12 (12 channel)

There a many different makes and models of GPS, and the instruction manual should be read carefully to ensure correct usage of the unit. The model use in this course is the Garmin GPS 12 (12 channel).

Once the GPS is turned on, the Garmin welcome page appears while the unit conducts a self-test.

After the testing is complete, the welcome page is replaced by the satellite page and the GPS starts to gather information from the satellites needed to get a position fix.

1.3.1 Getting a position fix

The GPS will automatically provide a position fix.

You will notice this when the unit automatically changes from the satellite page to the position page (see below)

In order to get a position you need to have a clear view of the sky. If there are large buildings or big trees nearby, the receiver may not be receiving enough satellite signals to calculate a fix.

If you are using a GPS in from the car, make sure the unit is placed on the dashboard or where it has the clearest possible view of the sky.

1.3.2 Storing a position fix (waypoint)

Once you have obtained a position fix:

Press Mark default 3 digit waypoint name, highlight save and press enter.

If you wish to change this name see the instructions in Annex1 section 3.1

1.3.3 Finding a stored position fix

Once a position fix is saved as a waypoint it can be retrieved:

Scroll through the GPS “pages” (by pressing the pages button) until you get to the menu page.

Highlight menu item WAYPOINT LIST Press Enter

Highlight the waypoint you wish to view Press Enter

The coordinates for the selected waypoint will appear.

If you wish to rename the waypoint: Highlight RENAME Press Enter

Rename the waypoint following the instructions in Annex 1 section 3.1

ANNEX1: USE OF GARMIN GPS 12 (12 Channel)

1. The Garmin GPS 12 (12 Channel): unit features

Insert GPS Photo

2. Initialising the receiver

If the GPS has not been used for a very long period more than 5 months, or the batteries have been replaced, or the unit has been moved more than 800 Km from its last fix, it should be re-installed:

- Press and hold power key
- Press Enter
- Highlight Selected country, press Enter
- Set GPS in open area
- Fix obtained (GPS initialised) when Satellite Page changes to Position Page (if Position Page has not appeared after 10 min, switch the GPS off momentarily and then back again)

3. Waypoints

3.1 Mark and name present position as a waypoint

Switch on GPS and obtain position fix

Press Mark default 3digit waypoint name

Highlight name field, press enter

Enter waypoint name/number (max.6 characters)
Highlight blank spaces for waypoint name, press Enter
Enter first character using keypad (characters are in sequences A to Z and 0 to 9, so press key up to advance and press key down to go back)
Press keypad right to move to next character position and enter character; repeat process until name complete
Press Enter

3.2 Check for Individual waypoints

Press page repeatedly until menu appears
Select Waypoint List, press Enter
Select waypoint to be checked, Press Enter
You will be provided with the selected waypoint details

3.3 Delete individual waypoints

Menu, select Waypoint to be checked, Press Enter
You will be provided with selected waypoint details
Select Delete, Press Enter
Select Yes, Press Enter

3.4 Create waypoints manually (or edit existing waypoints)

Menu, Select Waypoint, Press Enter will display waypoint page
Select New, press Enter
Enter the new waypoint name and/or number (maximum 6 characters)

- Highlight blank spaces for waypoint name, Press Enter
- Enter first character using keypad (characters are in sequence A to Z and 0 to 9, so press key up advance and press key down to go back)
- Press keypad right to move to next character position and Enter character; repeat process until name complete
- Press Enter will present S & E coordinates highlighted
- Press Enter S or E highlighted
- Press keypad to change E to S (if necessary)
- Press keypad right to enter (or edit) the S coordinates and then the E coordinate
- Press Enter, highlight Done, press Enter

3.5 Create a new waypoint by referring a stored waypoint or the present position

Obtain position fix
Press Page repeatedly until menu appears
Select Waypoint, press Enter
Highlight New, press Enter
Enter destination waypoint name/number (as in no), Press Enter
Highlight New, Press Enter
Highlight REF, Press Enter
Enter name/number of reference waypoint OR LEAVE BLANK IF YOU WANT TO USE PRESENT POSITION AS POINT OF REFERENCE, press Enter

Enter estimated bearing (degrees) and distance (km) of destination waypoint from reference waypoint

Press enter, highlight done, press Enter

3.6 To use the GPS to go to a stored waypoint

Press GOTO

Select the waypoint you want to navigate to, press Enter

Press Enter again, there will be two options (High Way or Compass) chose the appropriate, e.g. if you select compass, the compass will guide you by means of an arrow.

The following features will appear on the GPS screen:

- Bearing to destination
- Distance to destination
- Name of destination waypoint
- Ground track bearing (while moving)
- Ground

Select ETE, field

Highlight ETE, press Enter

Use keypad to scroll through options

ETE – Estimate time to destination based on based on present speed and track

ETA - Estimate time of arrival

CTS - Course to steer

XTK – Distance of course

VMG – Velocity made good

ANNEX 2: CONFIGURING THE GPS

The first step with using the GPS is to check the configuration settings for map datum, units, position format and operating mode.

1. Switch on this GPS (press and hold power key for 1 second)
2. Press page repeatedly until main Menu appears
3. Select Nav. Setup, press Enter
4. Select Position, press Enter
5. Toggle through alternatives and select as required (e.g. **hddd°mm'ss.s"** For degrees, minutes and seconds)
6. From Nav Setup menu select Datum, press Enter
7. Toggle through alternatives and select **WGS 84**, press Enter
8. From Nav Setup menu select units, press Enter
9. Toggle through alternatives and select Metric, press Enter
10. Press page until main menu appears

11. Select System Setup, Press Enter
12. From System Setup menu select Mode, Press Enter
13. Select Battery Saver Mode, press Enter
14. From System Setup menu select Offset
15. Enter time offset in relation to UTC (GMT) i.e. +02.00 in summer and + 01.00 in winter (N.B. date and time are derived directly from the satellites and cannot be changed by the user, except for altering the time offset) press Enter.
16. Press Page repeatedly until the Status appears, continue with data collection.