

Bioamrywiaeth a'r amgylchedd

Biodiversity and the environment



Beth yw bioamrywiaeth?

What is biodiversity?

- Yr holl organebau byw oddifewn cynefin.
- All the living things in a habitat.



Bioamrywiaeth uchel – Llawer o wahanol bethau byw yn y cynefin. Mae bioamrywiaeth uchel yn arwydd o gynefin iach.

High biodiversity – Many different living things living in the habitat.
High biodiversity is a sign of a healthy habitat



Bioamrywiaeth isel

Low biodiversity



Dim llawer o wahanol pethau byw yn y cynefin.

e.e. Caeau ungnwd = bioamrywiaeth isel

Not many different living things in the habitat.

eg. Monoculture = low biodiversity

Pam mesur bioamrywiaeth?

Why measure biodiversity?

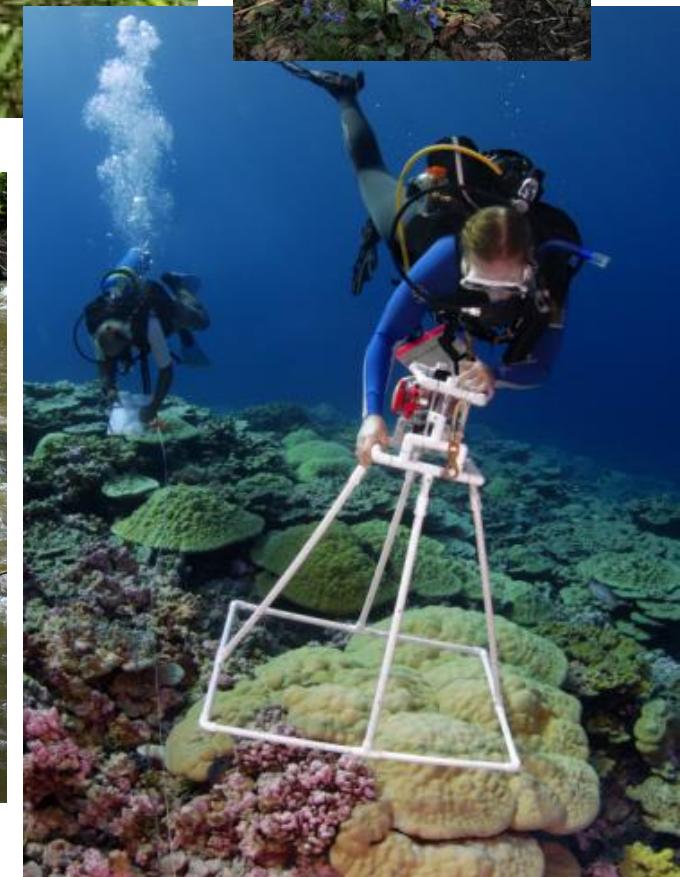
Mae'n bwysig i wyddonwyr allu mesur bioamrywiaeth mewn cynefinoedd er mwyn monitro er mwyn gweld os oes newid.

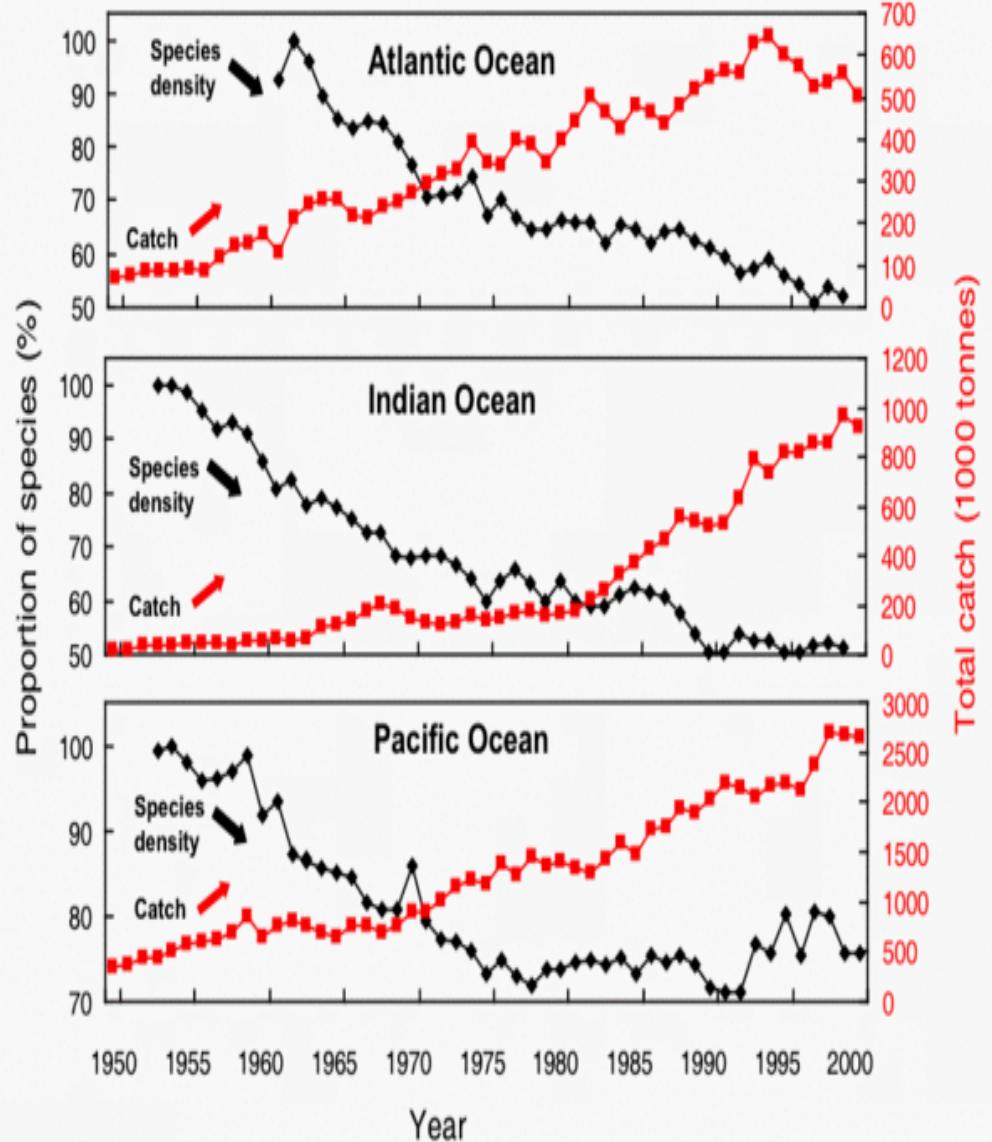
It's important for scientists to measure the biodiversity in habitats to monitor for any changes.



Mae gwyddonwyr yn gallu defnyddio'r gwybodaeth o fesur yr amgylchedd i weld os oes effaith ac gweld os oes ffordd i'w atal yn gynnar cyn fo gormod o niwed.

Scientists can use the measurements about the environment to see if there are any changes and respond to them early before too much damage is made.





Legend: Changes in species density (the number of species caught on a standard fishing line with 1000 hooks) and total catch of tuna and billfish by ocean.

Beth mae'r graffiau yma yn dangos i ni am effaith pysgota ar y nifer o rhywogaethau pysgod yn y cefnforoedd?

What do the graphs show us about the effect of fishing on the biodiversity of the oceans?

Sut mae mesur bioamrywiaeth.

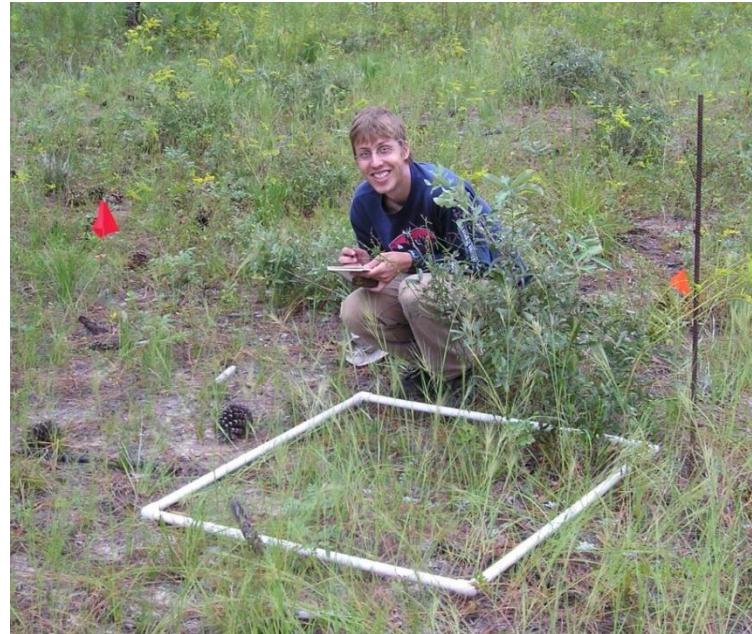
Measuring biodiversity



1. Dull quadrat / Quadrat method

Mae'r gwyddonydd yn rhoi swarz 1m x 1m ar y llawr a'i ddefnyddio i gyfri nifer y gwahanol bethau byw mewn 1m^2 .

Mae posib lloosi'r nifer o organebau mewn un metr swarz gyda arwynebedd y cynefin er mwyn cael amcangyfrif o'r nifer yn y cynefin gyfan



The scientist places a $1\text{m} \times 1\text{m}$ square on the floor and this is used to count the number of different living things in a square meter. It is possible to multiply the number of organisms in an area of 1M^2 with the total area of the habitat to get an estimate of the numbers in the whole habitat.

Dull cwadrat- Arbrawf teg?

Quadrat method- A fair test?

- Mae'n rhaid gollwng y cwadrat ar hap yn y cynefin .
- The quadrat must be dropped at random in the habitat.
- Mae'n rhaid ailadrodd y cyfri i'w wneud yn ddibynadwy.
- The test must be repeated in order to make the results more reliable.
- Mae'n cymryd fod y cynefin yr un peth ym mhob rhan.
- It assumes all parts of the habitat are the same

Dull Transect / Transect method

1. Samplu Llinell drawslun Line-intercept sampling

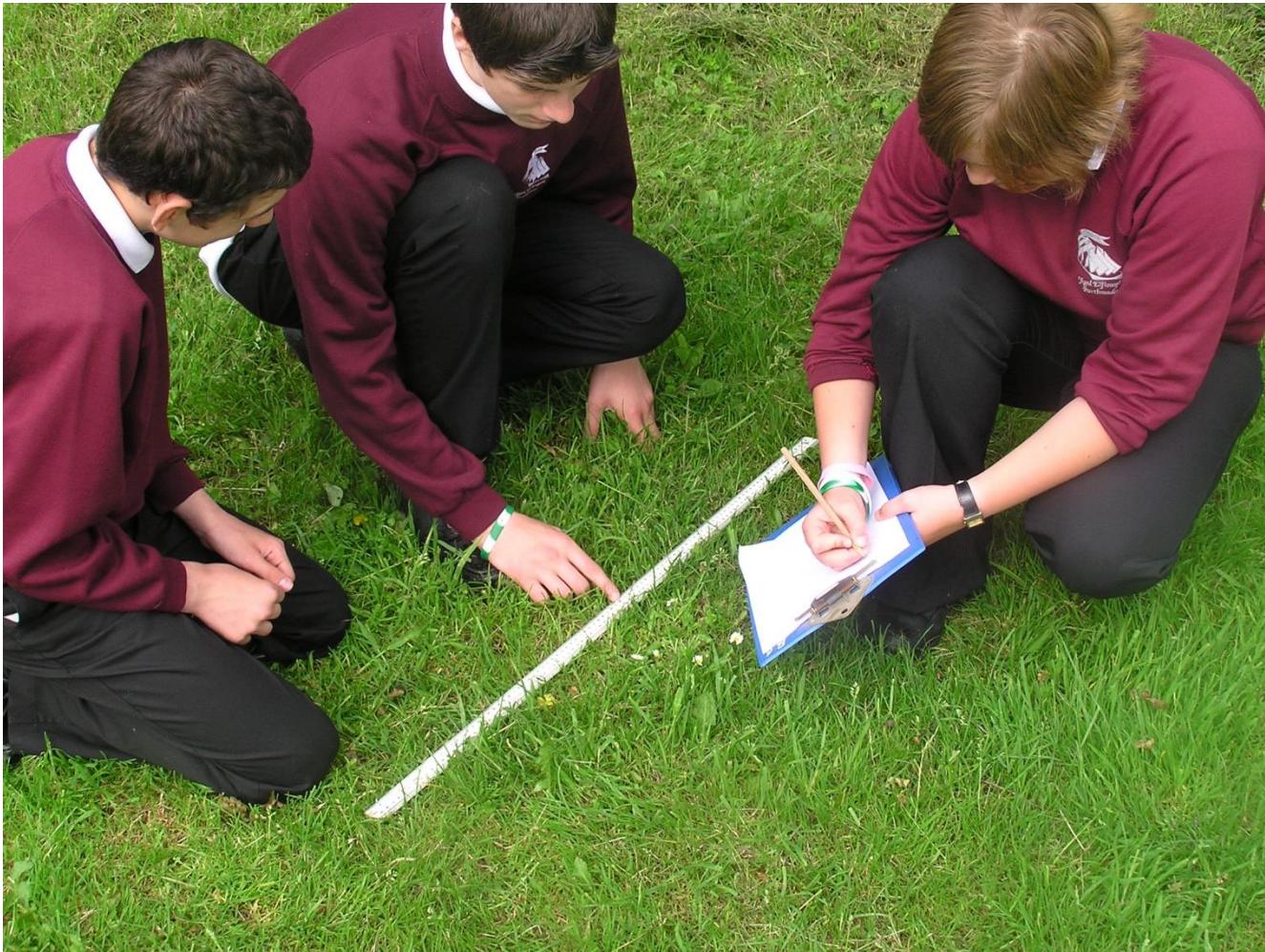


Transect	Transect 1	Transect 2	Transect 3	Average (Transect 1 + Tran- sect 2 + Transect 3) ÷ 3	% in the habitat $\text{Average} \div 30 \times 100$
Number plant A 					
Number plant B 					
Number plant C 					
Number plant D 					
Number of soil					

Gwaith maes Ecoleg



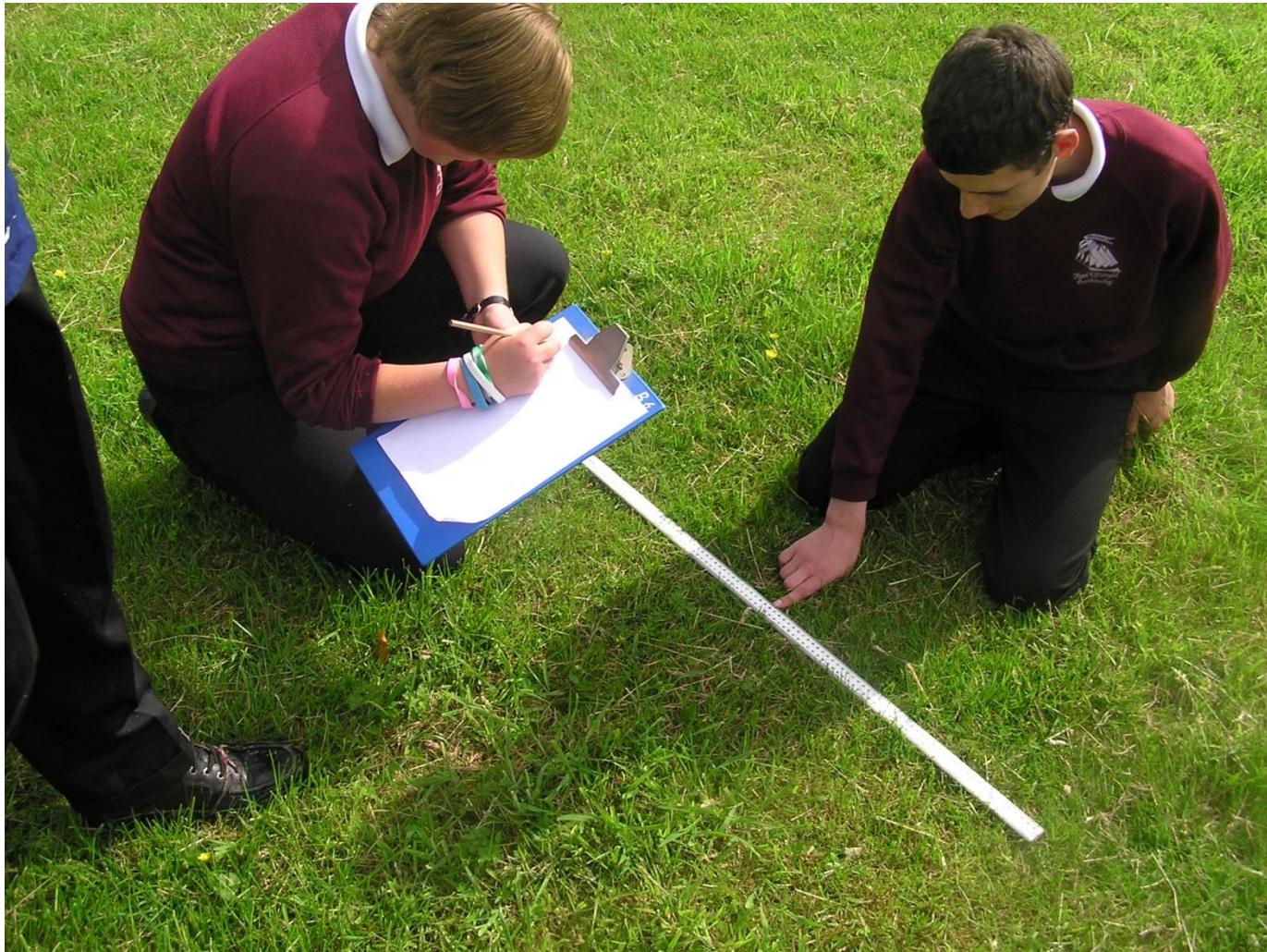
Mae llawer o wahanol blanhigion yn byw ar gaeau'r ysgol. Mae posib mesur faint o wahanol blanhigion sydd i'w cael trwy ddefnyddio pren mesur medr.



Rhowch y pren mesur i lawr ar hap yn y cynefin i'w ymchwilio a chofnodwch beth sy'n cyffwrdd y pren mesur ar bob centimedr.

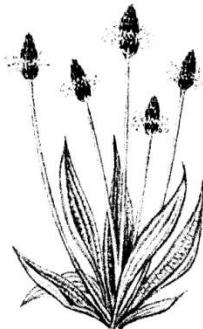


Wedyn gwnewch yr un peth mewn rhan
arall o'r cynefin.



Dyma rhai o'r planhigion mwyaf cyffredin ar gaeau'r ysgol

Llwynhydd



Llysiau'r Gingroen



Llygad y Dydd

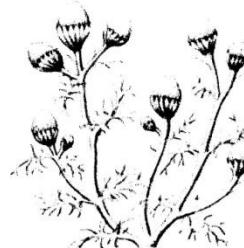


Llysiau Tryfal



Rhaid gwarchod
pethau byw. Peidiwch
â chasglu'r blodau.

Chwyn Afal Pinwydd



Meillionen



Dail Tafol



Blodyn Ymenyn



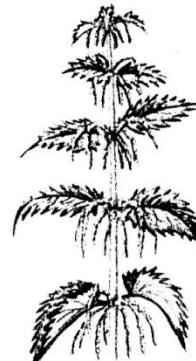
Helyglys Hardd



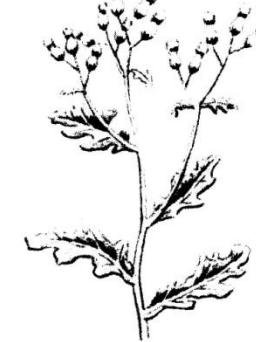
Dant y Llew



Danadl Poethion



Greulys



Llygaid y dydd





Dant y llew



Llwynhidyd

Meillion





Blodyn menyn

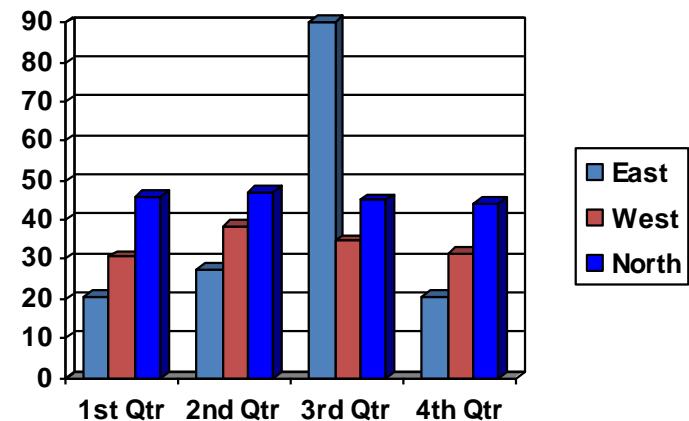
Mae'n syniad da cael tabl i gofnodi'r canlyniadau cyn dechrau

Safle	% Gwair	% Pridd	% Llygad y dydd	% Uwynhîd y dd	% dant y llew
Gol					
Hanner					
clawdd					
Llwybr					

Mae rhannau o gaeau'r ysgol yn cael eu defnyddio mwy nag eraill i gerdded neu i chwarae gemau.

Cynlluniwch a gwnewch arbrawf teg i ddarganfod beth yw effaith dyn ar fioamrywiaeth caeau'r ysgol.

Wedi gwneud yr arbrawf ysgrifennwch adroddiad o'r hyn yr ydych wedi ei ddarganfod gan gynnwys dulliau graffigol effeithiol i ddangos eich canlyniadau.

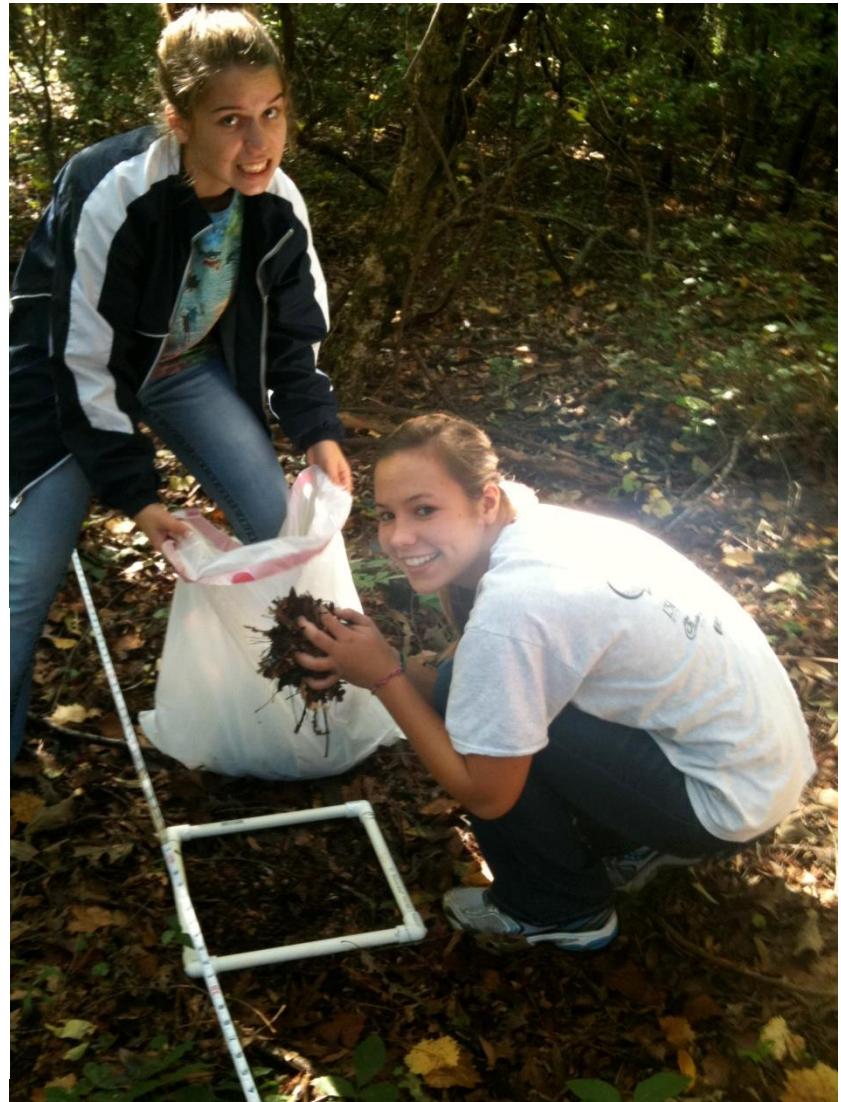
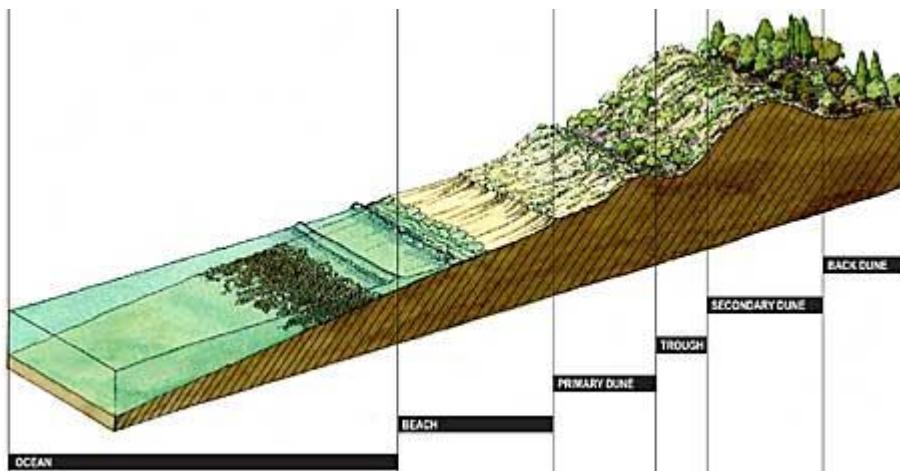


Belt transect

Cael ei ddefnyddio i fesur sut mae
cynefin yn newid gyda phellter.
Ee gwahanol bethau byw ar wahanol
rannau o'r traeth

Belt transects can be used to
measure how habitats change over
distance.

E.g. the different living things that
live on different regions of the
seashore



Belt transect

- Rhoi tap ar hyd y cynefin.
- Place a tape along the habitat
- Rhoi cwadrat ar y llawr bob mesur penodol. E.e. bob 1 metr neu 5m neu 100m
- Place a quadrat at specific distances along the tape e.g. every 1m or 5m or even 100m
- Cofnodi canran y pethau byw ar bob pellter.
- Record the percentage of the different living things at each distance.



Rocky Shore Zonation

Splash Zone

High-Tide Zone

Mid-Tide Zone

Low-Tide Zone

Intertidal Zone

Faunal Turf

Anemones

Mussels

Hermit Crab

Limpets

Barnacles



Periwinkles

Spiral
Wrack

Bladder
Wrack

Saw
Wrack

Kelp Forest

Benthic Invertebrates

Dull dal/ailddal

Mae'r dull yma yn cael
ei ddefnyddio i
amcangyfrif nifer o
anifeiliaid mewn sefyllfa
lle mae'n amhosib eu
cyfri i gyd.

This approach is used to
estimate the number of
animals in a situation
where it is impossible to
count them all.



Cam 1 / Step 1

Gosod trap i ddal nifer o'r anifeiliaid- eu cyfri a'u marcio (M)

Set a trap to catch a number of animals- count them and mark them. (M)



Cam 2 / Step 2

Eu rhyddhau yn ol i'r cynefin.
Release them back into the habitat.

Cam 3/ Step 3

Disgwyl am gyfnod
wedyn ail osod y trap.

Wait a while then re-lay
the trap.



Cam 4/ Step 4

Cyfri faint o falwod wedi eu marcio sydd wedi eu
ailddal (R) a chyfri y cyfanswm ailddalwyd (C)

Count the number of marked snails that are
recaught (R) and count the total that are
recaught (C)

$$\frac{\text{Number marked in second sample}}{\text{Total caught in second sample}} = \frac{\text{Number marked in first sample}}{\text{Size of whole population (N)}}$$

$$R/C = M/N$$

$$N = \frac{MC}{R}$$

N = Estimate of total population size
 M = Total number of animals captured and marked on the first visit
 C = Total number of animals captured on the second visit
 R = Number of animals captured on the first visit that were then recaptured on the second visit

Manteision ac anfanteision y dull dal/ailddal

Advantages and disadvantages of the capture /release method.

- Anfantais y dull hwn yw ei fod yn cymryd yn ganiataol bod unigolyn wedi'i farcio gyda'r un cyfle o gael ei ail-ddal a unigolyn heb ei farcio.
- Gall unigolion a gafodd eu dal unwaith fod mwy gwyliadwrus o drapiau, neu gallant chwilio am drapiau gan eu bod wedi dysgu fod trapiau'n darparu bwyd.
- A disadvantage of this method is that it assumes that a marked individual has the same chance of being trapped as an unmarked individual.
- Individuals that were trapped once may be wary of traps, or they may seek traps since they have learned that traps provide food

Astudiaethau o'r effaith amgylcheddol

Environmental impact studies

Cyn dechrau adeiladu ffyrdd ac yn y blaen mae'n rhaid i'r asiantaethau amgylcheddol wneud astudiaeth o'r effaith amgylcheddol.

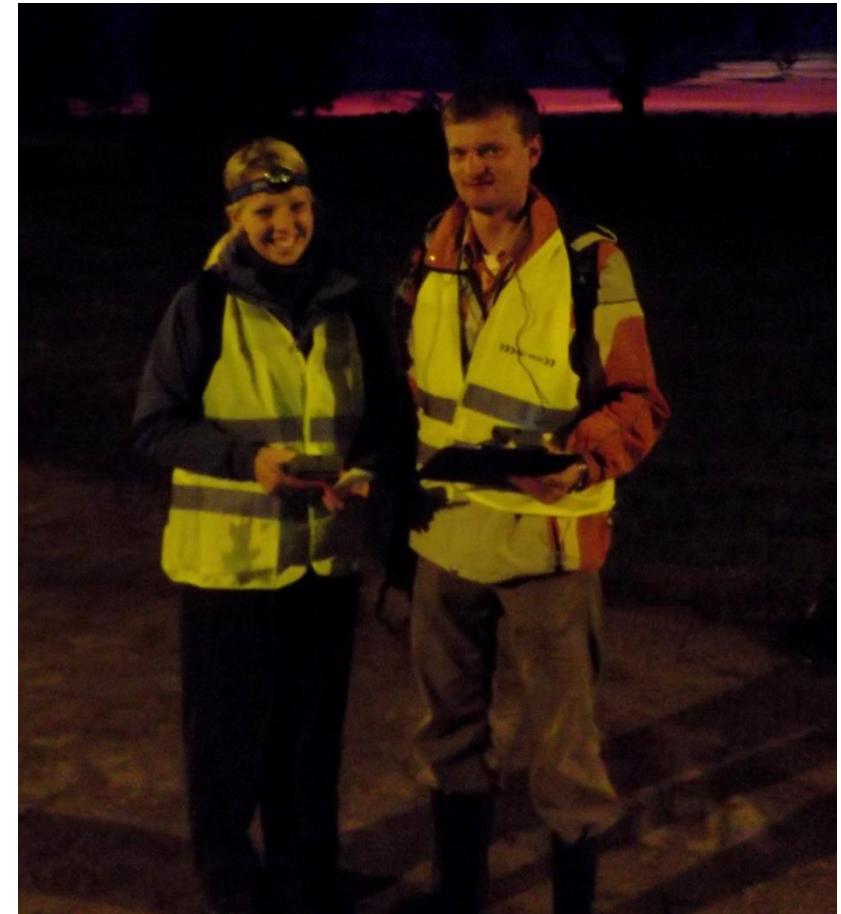
Before any new building project the environmental agencies must carry out an environmental impact study.



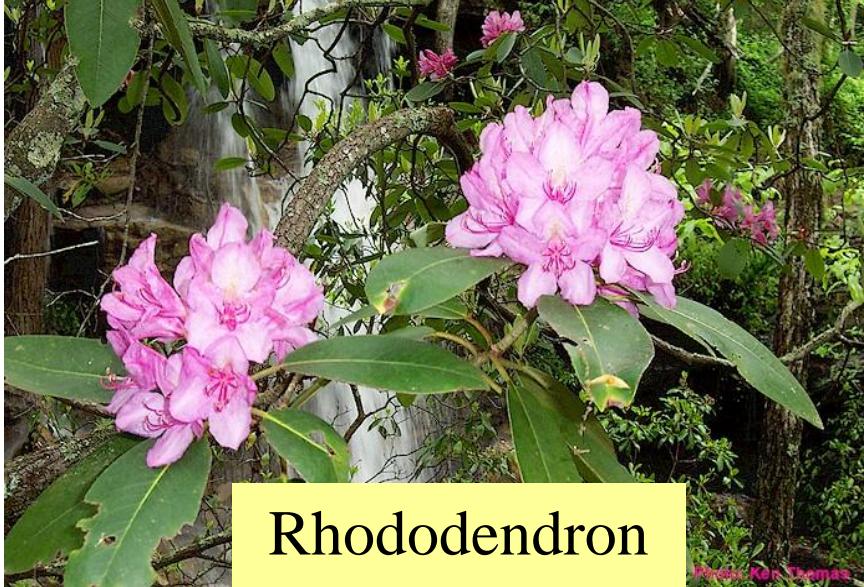
Pam parhau wedi'r gwaith?

Why carry on after projects are completed?

- Sicrhau nad oes effaith tymor hir 'r amgylchedd.
- To ensure there are no long term effects on the habitat



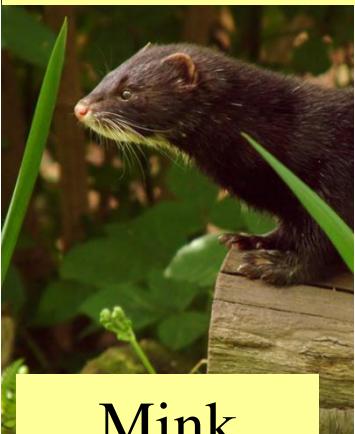
Organbau estron / *Alien species*



Rhododendron
ponticum



Japanese knotweed



Mink



Grey squirrel

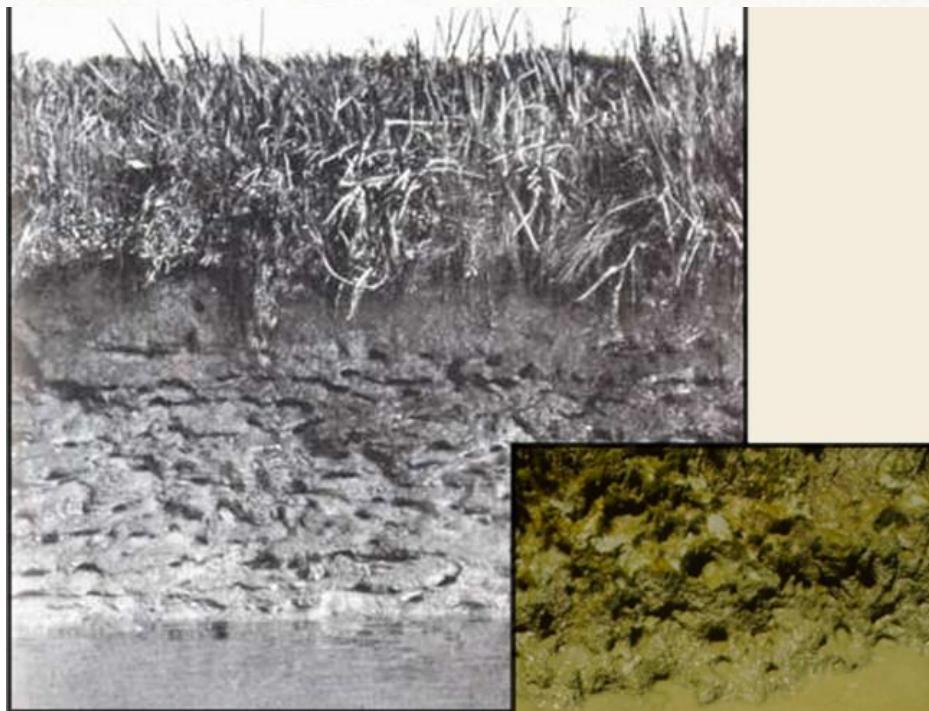


American slipper
limpet

Organebau estron / *Alien species*

- Mae organebau estron yn gallu tyfu allan o rheolaeth oherwydd diffyg gelynion naturiol.
- *Introduced species can grow out of control due to not having any natural enemies.*
- Maent yn cystadlu gyda organebau prydeinig am fwyd neu golau ac yn gallu arwain i leihad yn nifer yr pethau byw gwreiddiol.
- *They can compete with British organisms for food or light and so reduce their numbers.*
- Maent yn newid y cynefin fel bod pethau byw Prydeinig yn methu goroesi
- *They can change a habitat so that British species cannot survive.*

Chinese mitten crab



Distribution of the
Chinese mitten crab

● Sightings



MarLIN

Killer shrimp-*Dikerogammarus villosus*



Wedi dod i'r wlad o'r Môr Du ar waelod
llongau.

Cystadlu yn erbyn a lladd cramenogion
brodorol a bwyta wyau pysgod.

[video](#)

I'w gael ym mae Caerdydd



Himalayan balsam



New Zealand flatworm



Zebra mussel

UF

Beth yw rheoli biolegol?

What is biological control?

- Mae dyn yn defnyddio gelynion naturiol y pla i'w rheoli.
- E.e. Defnyddio buchod goch gota i rheoli llyslau mewn tai gwydr tyfu tomatos.
- *Man uses the natural enemies of the pest to control it.*
- *E.g. Using ladybirds to control the greenfly in greenhouses that grow tomatoes.*



Rheolaeth Biolegol

Biological control

- Mae defnyddio plaladdwyr yn ddrud ac yn dinistrio'r amgylchedd, felly mae gwyddonwyr yn defnyddio dulliau rheoli biolegol i geisio rheoli pla.
- *Using pesticides is expensive and harmful to the environment, so scientists use biological control methods to try to control pests*

Enghreifftiau o rheolaeth biologol.

Examples of biological control.

Problem y gellygen bigog yn awstralia.

The prickly pear problem in Australia

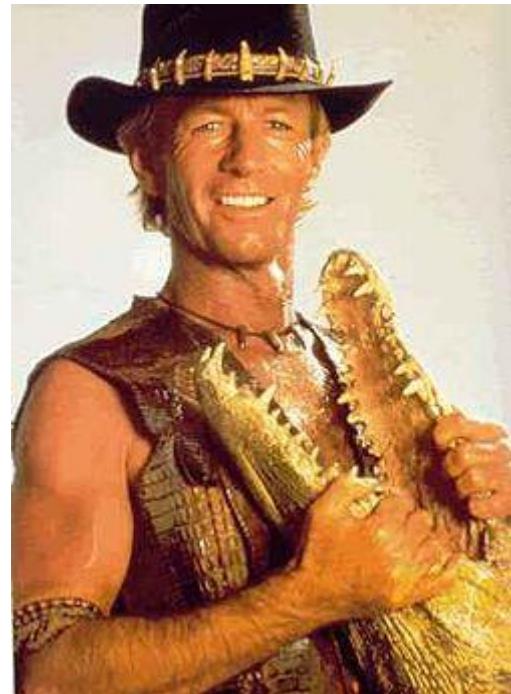




Cane Toad



- Cane Toads are considered a pest in Australia because they:
- poison pets and injure humans with their toxins
- poison many native animals whose diet includes frogs, tadpoles and frogs' eggs
- eat large numbers of honey bees, creating a management problem for bee-keepers
- prey on native fauna
- compete for food with vertebrate insectivores such as small skinks
- may carry diseases that can be transmitted to native frogs and fishes



http://www.australiagift.com/toad_shop.htm

Llysiau'r dial

Japanese knotweed



Llysiau'r dial

Japanese knotweed

- Mae gwyddonwyr wedi darganfod pry psyllid o'r enw *Aphalara itadori* sy'n sugno'r maeth o'r planhigyn yma ac yn ceisio cael caniatad i'w rhyddhau i'r gwylt ym Mhrydain.
- Scientists have found an psyllid insect called *Aphalara itadori* that sucks the nutrients out of the plant and are trying to get permission to release it into the wild in Britain
- Maent wedi arbrofi ar y pry i sicrhau nad yw'n bwyta planhigion brodorol.
- They have experimented with the insect to ensure that it does not eat British plants.

Manteision Rheolaeth biolegol.

Advantages of biological control.

- Dim yn defnyddio cemegau sy'n mynd i'r gadwyn fwyd.
- Rhad!
- Dim rhaid ail drin y pla – mae'r gelynion yn bridio!
- Does not use chemicals that get into food chain.
- Cheap!
- No need to re-treat the pest- The predators breed themselves

Anfanteision rheolaeth iolegol

Disadvantages of biological control

- Mae'n cymeryd amser- Mae rheolaeth cemegol yn gyflymach
- Nid yw'n cael gwared o'r holl creaduriad pla- mae ychydig ar ol bob amser.
- Gallu mynd allan o rheolaeth!
- *It takes time to work- Chemical control is much quicker.*
- *Does not get rid of all the pests- some will remain.*
- *Can get out of control!*

Mae'n rhaid bod yn ofalus cyn defnyddio dulliau rheoli biolegol!

- Astudio'r cynefin yn ofalus o flaen llaw.
- Astudio'r cadwyn fwyd.
- Sicrhau nad yw'r organeb estron yn bwyta pethau eraill ayyb