

Climate, Nature and Planning





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Buidheann Nàdair na h-Alba



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Nature Crisis

24%

decline in
average
species
abundance

49%

of species
have
decreased
in
abundance

14%




decline in
species
distribution

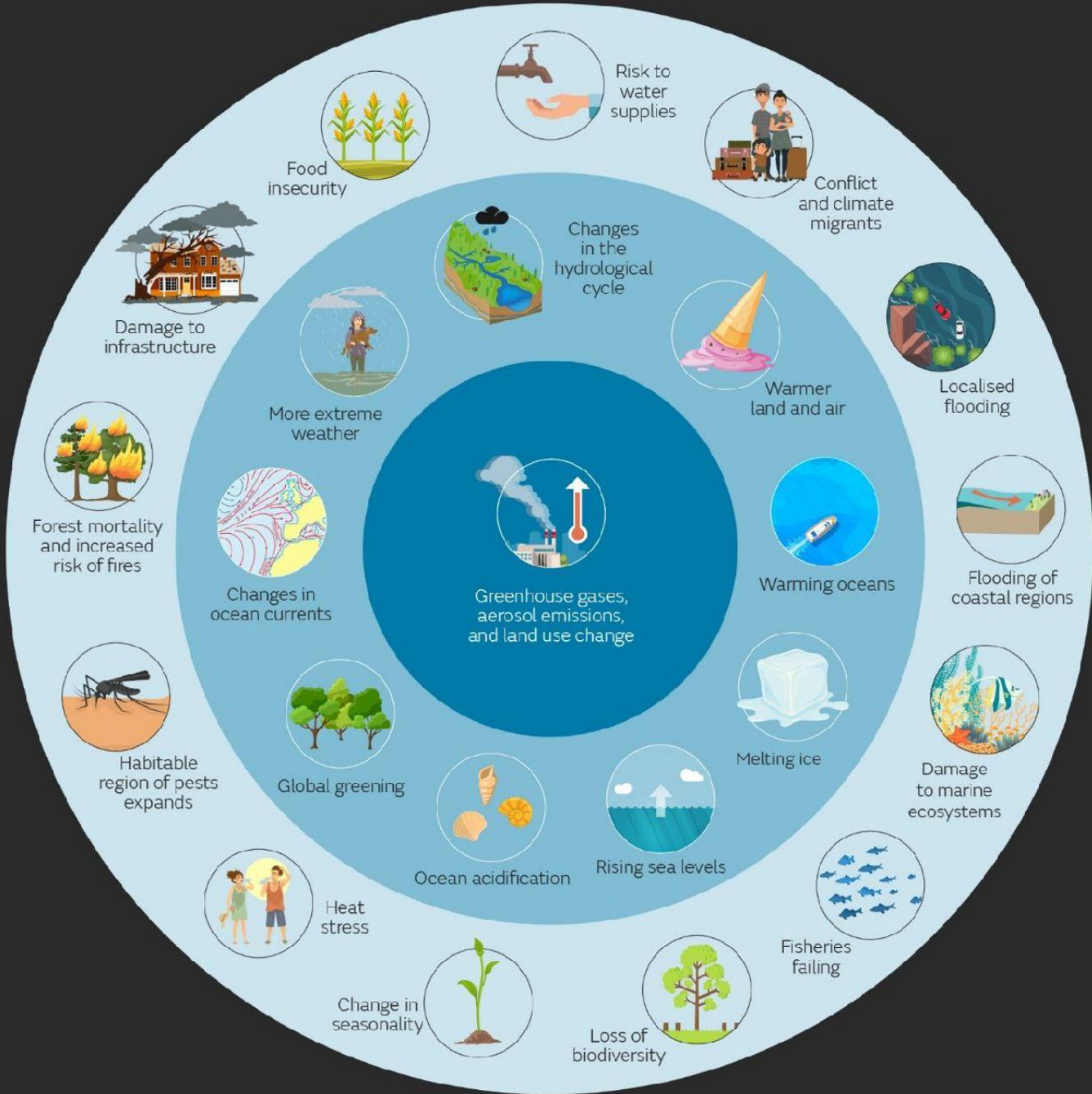


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Climate Crisis

-  Drivers of climate change
-  Changes to the climate system
-  Impacts



Climate and Nature

So, we have a **triple challenge** (or opportunity through **green recovery**...)

- **Reduce emissions** for a net zero economy, which will require major changes in the use of the land and sea with consequences for the state of nature;
- **Adapt** to climate change that is already locked into the system, which will also require major changes in the use of the land and sea; and
- Improve the **state of nature** by tackling the main drivers of biodiversity loss, which include climate change.

**All three - over the same period of time (2020-2045)
and on the same areas of land and sea
= integration**

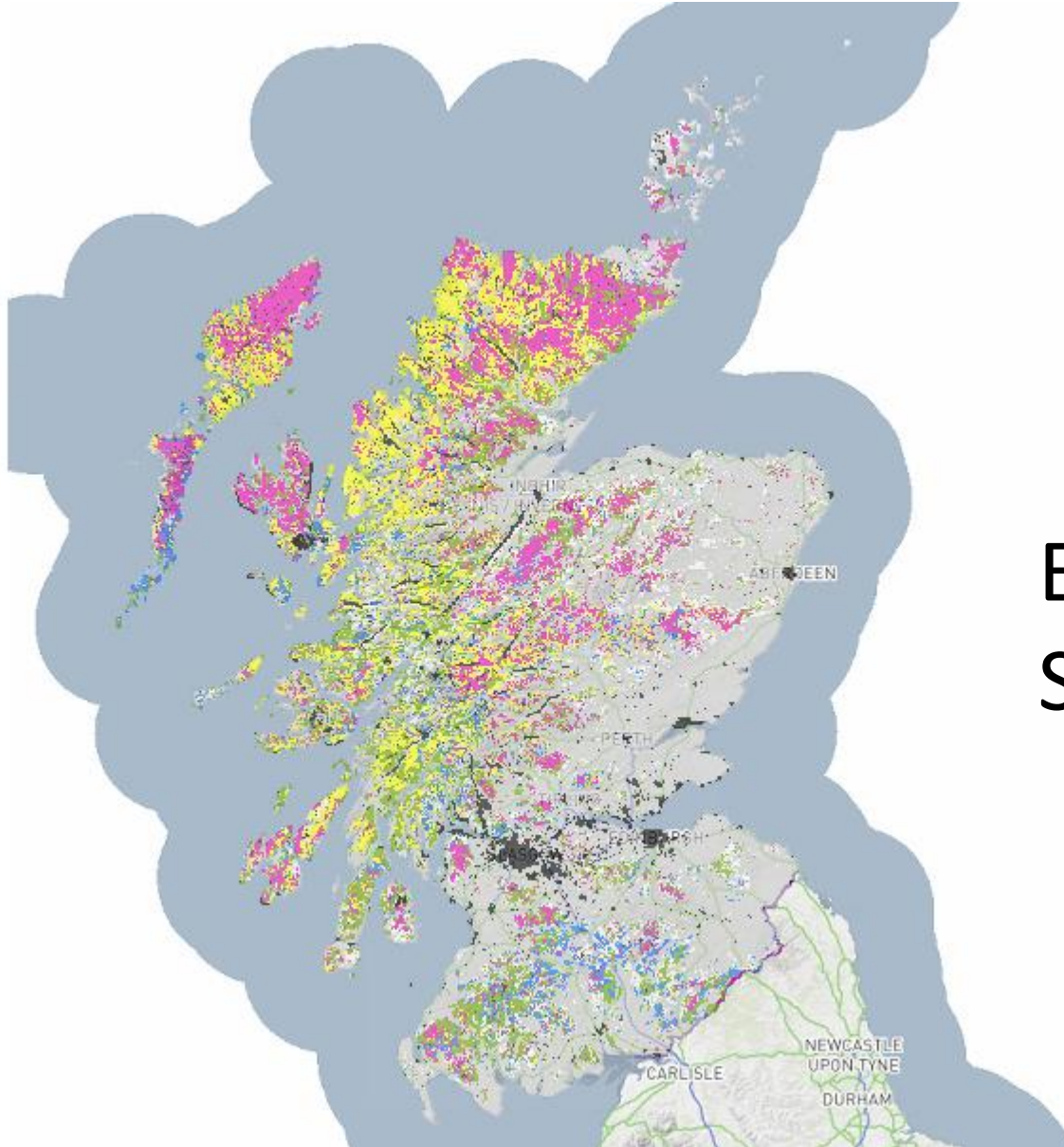


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Example of National
Soil mapping

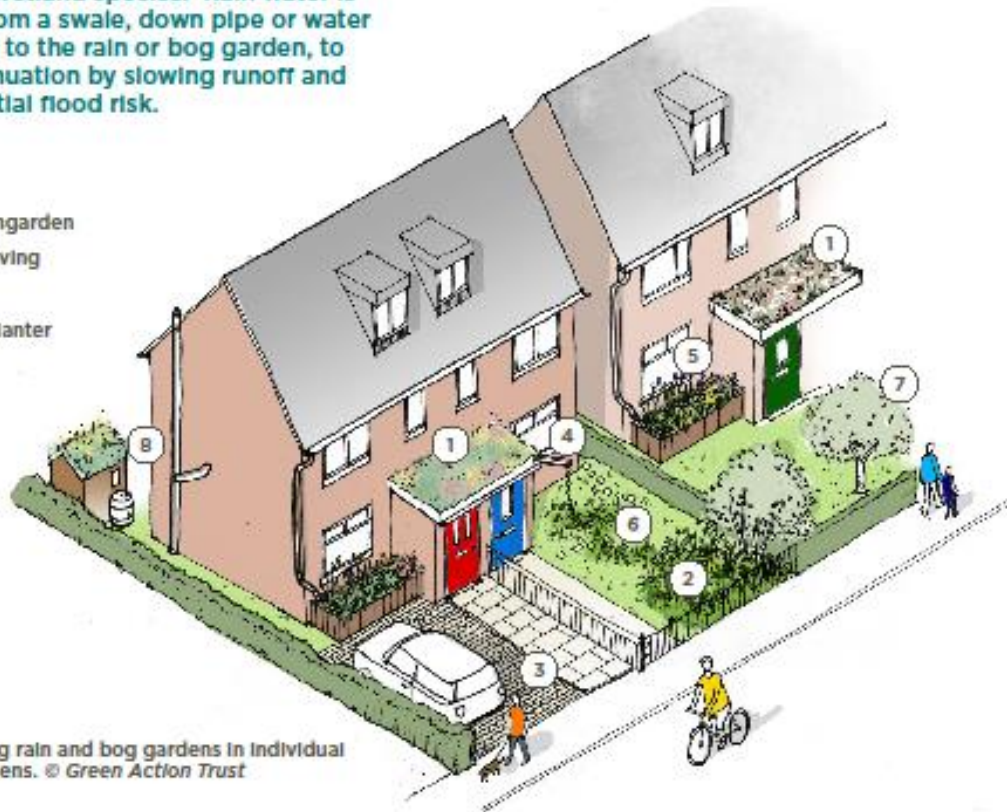
Measure 19: Rain garden

These features channel water for the purpose of water control but are designed and managed in a way to provide for wildlife.

Rain and bog gardens for Buildings

Rain gardens consist of planters and low lying garden areas, planted with wet loving or tolerant plants that temporarily retain water for slow release into the surrounding area. The bog garden is similar, lined to increase water retention if necessary, and planted with water loving wetland species. Rain water is channelled from a swale, down pipe or water butt overflow to the rain or bog garden, to increase attenuation by slowing runoff and reduce potential flood risk.

1. Green roof
2. In-ground raingarden
3. Permeable paving
4. Rain chain
5. Raingarden planter
6. Swale
7. Trees
8. Water butt



Ideas for creating rain and bog gardens in individual houses and gardens. © Green Action Trust

Rain gardens for streets

Street rain gardens incorporate swales and road kerbs to channel runoff from roads, parking areas and paths. Designed to absorb larger volumes of water they are usually planted with trees and shrubs for greater take up of water. Some include deep hidden wells dug along the street edge with a tree planted on top.



© Lorne Gill/NatureScot

Nature benefitted

- The damp or wet habitat areas created support many invertebrate and amphibian species. These areas can be especially beneficial to pollinators as the availability of water in dry weather can help increase nectar production.
- With their enhanced water storage capacity the plants and trees planted in the rain garden can remain healthier, providing more shelter and a better food source for invertebrates.



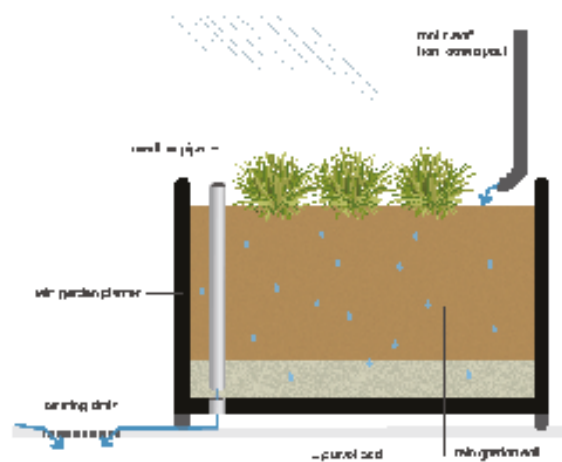
Plants can provide a better food source for invertebrates. © Lorne Gill/NatureScot

Key requirements



Rain and bog gardens can be relatively small areas, incorporated in to any scale of development as long as any excess water can be safely diverted away. The area needs to be of a gradient that allows water to sit or slowly pass through and not run off immediately (a bog garden requires a dip in the landscape), with soil not so free draining to allow some accumulation of water. A bog garden may require a liner if the ground is very permeable.

Rain gardens for streets can be accommodated in developments with a paved street or communal area from where water can be channelled. Careful consideration of the volume of water that the landscaped area can absorb is required, with a suitable overflow into further features in case the volume of water exceeds its capacity.



How to create a bog garden in a planter
© www.raingardens.info

Future management

Regular but low level maintenance is required to ensure the feature and vegetation within it are functioning correctly.

- Ensure water can flow freely in to the rain garden and also from the outflow, without eroding the soil. Debris can be easily washed in and should be regularly 'litter' picked.
- Trees and plants within the rain garden require checking to ensure the wet conditions are suitable, and regular weeding to prevent any invasives becoming established or other species dominating.

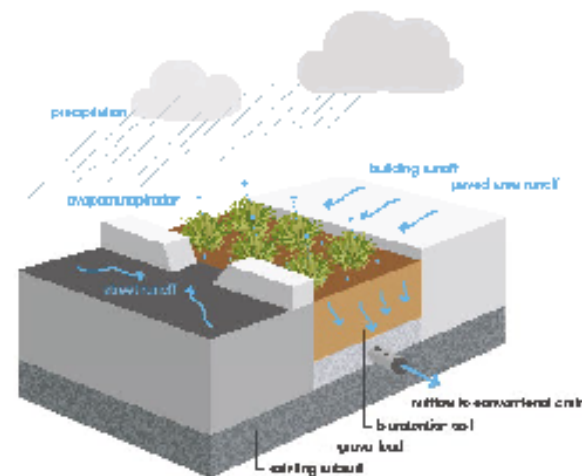
Complementary measures

Rain gardens can be planted with a range of suitable wildlife and pollinator friendly plants (measure 1). Wildlife swales and ditches (measure 20) can be used to channel water into a rain garden, and provide for its overflow, and can link to SuDS ponds (measure 21).

Bug hotels and log and leaf piles (measures 11 and 8) can be placed in rain gardens, providing a damper environment that is particularly beneficial to invertebrates and amphibians in dry weather.

Nature notes

By retaining water these features reduce the risk of flooding both on site and downstream of the development. These areas will remain damper for longer periods than the surrounding area which can be important for invertebrate species, especially amphibians during periods of exceptional dry weather. As with all vegetated areas they contribute to urban cooling.



How to create a pavement-side rain garden
© www.raingardens.info

Further information

- On creating a rain garden see the *Rain garden guide*, Green Action Trust's *10,000 raingardens for Scotland* campaign and the *Royal Horticultural Society website*
- On creating a bog garden see The Wildlife Trust's *How to make a bog garden*

Appropriate measures format



- ❖ Description
- ❖ Nature benefitted
- ❖ Key requirements (to be successful)
- ❖ Future management needs
- ❖ Complementary measures
- ❖ Nature notes
- ❖ Sources for further information



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In summary

- Nature is essential BOTH in the transition to net zero AND to maintain it
- This means ALL uses of the land and sea need to change
- AND it means simultaneously reducing emissions, adapting to a changing climate and enhancing the state of nature.
- Finer scale integration = more diversity = more resilience
- Requires realistic system of valuing that includes acknowledgement of natural capital



*“Yes, the planet got destroyed.
But for a beautiful moment in time we
created a lot of value for shareholders.”*