



An tSeirbhís Páirceanna Náisiúnta  
agus Fiadhúlra  
National Parks and Wildlife Service

# Fire and peatland habitats



Barry O'Donoghue

# A bit about me and what I do

- Ciarraíoch go smúsach, mountain man, farming, managing land for nature, nature lover, ecologist, father
- Degree in Agriculture and Environmental Science, Master's and PhD on Hen Harrier (20<sup>th</sup> year of the IHHWS!)
- Wildlife Inspector Grade 1 with National Parks & Wildlife Service
- National remit including *inter alia* Agriculture
- Lifetime experience with burning

# Burning issue – no one stop shop

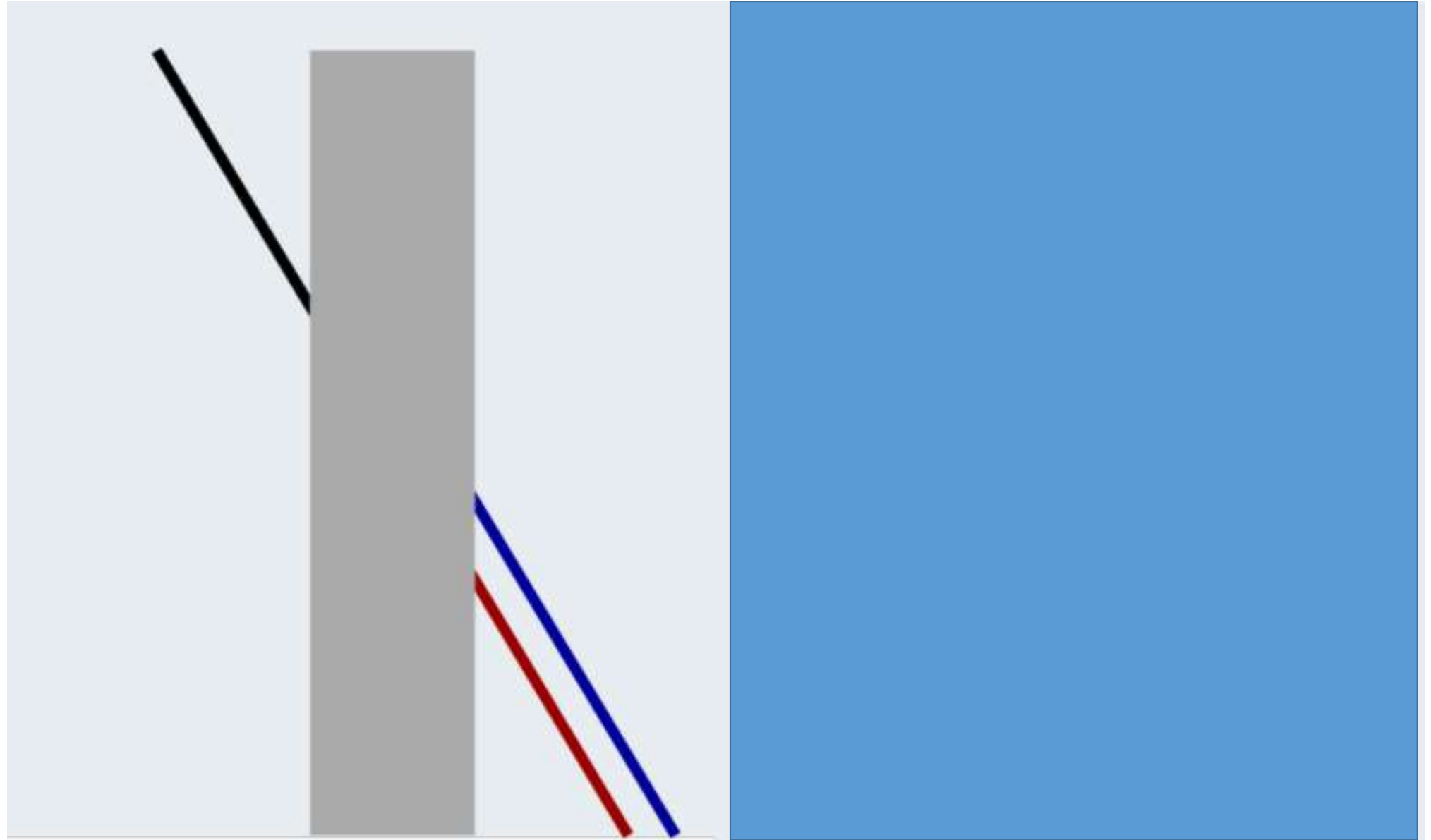
- Scientific Advice and Research – agriculture, uplands/peatlands, species interests
- Regional NPWS
- National Parks & Nature Reserves
- Licensing, Legislation and Guidance
- Wildlife Enforcement and Nature Protection
- Ecological Assessment Unit
- Ecological Guidance and Advisory Unit
  
- ...and that's just within NPWS (Míle buíochas le Caitriona Douglas; peatlands expert and photos)

## 'Farmers'

- Who are they?
- What do they do?

## 'Environmentalists'

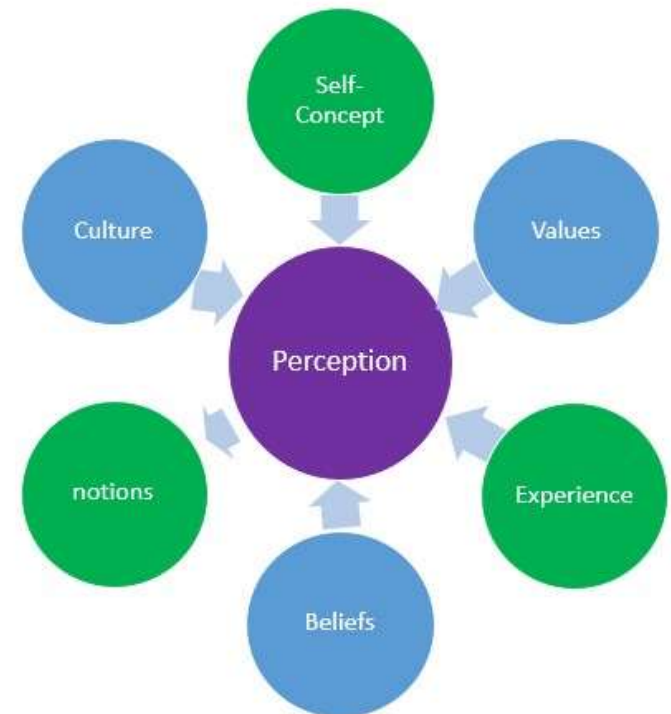
- Who are they?
- What do they do?





# Perceptions

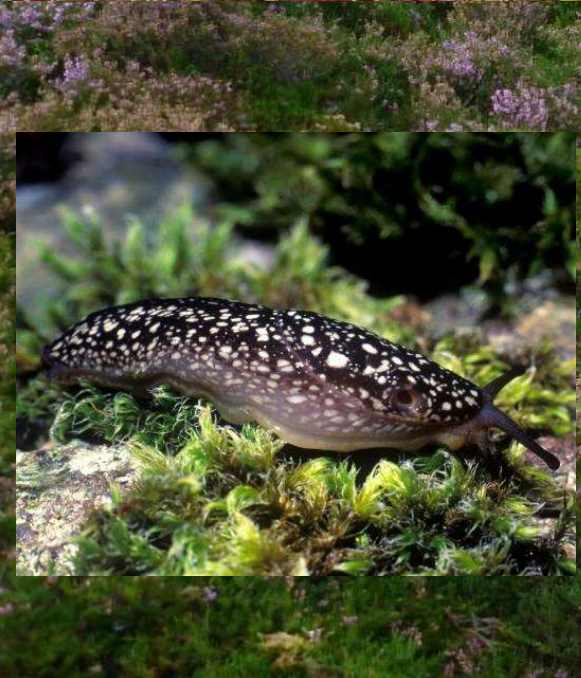
- (and science/sciences)



# Peatlands in Ireland

- Blanket Bog
    - Inactive and Active\* (\*Active bog (meaning those with significant areas of vegetation that is normally peat-forming) are accorded priority for protection however inactive areas are also have Annex I status as may be restorable)
  - Transition Mires and Quaking Bogs
  - *Rhynchosporion* depressions
  - Wet Heaths
  - Dry Heaths
  - Alpine & Boreal Heaths
  - Alkaline Fens
  - Petrifying Springs
  - Raised Bog
- (rare and threatened in Europe thus listed as EU Habitats Directive Annex I habitats)







# When is a Peatland in Favourable Conservation Status?

- Range & Area Stable or Expanding
- Characteristic Species Composition (flora/fauna)
- Characteristic Vegetation Structure
- Good Ecosystem Functioning (nutrient cycling; carbon balance; hydrology; etc)
- Good Future prospects



# Threats and Pressures

Peat Extraction

Forestry – c.300,000ha on peatlands

Unsustainable Grazing

Inappropriate Burning

Drainage

Reclamation

Climate Change, and the list goes on...

Changed cultural and social landscape;

Intergenerational considerations

Changed physical landscape

What are we managing for? – objectives and context are crucial





# Potential Impacts of Fire on Peatlands

- Biodiversity (flora/fauna)
- Peat soil and seed bank
- Carbon store and sequestration capacity
- Ecosystem functioning (Nutrient cycling; hydrology; GHGs etc.)
- Water quality and surface run-off in peatland catchments
- Habitat recovery potential
- “Uncontrolled” fires v. “controlled” fires
- Appropriate vs inappropriate



# What the science says in relation to 'appropriateness'

- Blanket bog is a climatic climax ecosystem and where intact requires minimal management. Fire is not required nor recommended as vegetation recovery time is very slow; Sphagnum cover can be reduced; peat formation can be retarded; and peat erosion is also a high risk
- Wet heaths are akin to shallow blanket bogs and sensitive to fire and can become dominated by Purple Moorgrass after fire and this can dominance can persist
- Dry heaths are heather/grassland habitats and depending on many factors controlled fire may possibly be a management tool though there must be very long interval between any such controlled fires to prevent habitat degradation
- Fire can have in-combination impacts with other land use pressure on peatlands
- Many peatlands are still recovering from heavy impacts from the ewe headage years and these are vulnerable to further degradation from fire. Burnt areas can be selectively grazed which can retard recovery.
- Species requirements also need to be considered, in tandem with habitat requirements.

# Interactions between Fire & other Pressures

- **Drainage** - Interactions between peatland drainage and fire are likely to cause long-term carbon emissions to far exceed rates of carbon uptake, diminishing the northern peatlands' carbon sink as peat formation is slow in these bogs (c. 1mm/pa) and is not occurring where bogs are drained and desiccated.
- **Grazing** - Burning promotes young growth for grazing, but excessive grazing can eliminate regeneration completely, leading to the loss of dwarf-shrub heath and the spread of Purple Moorgrass (*Molinia*). This is because heather regrowth on newly opened habitat after a burn is preferentially chosen as food by grazing livestock. Heather that is re-growing from seed after over-mature heather stands have been burnt is unlikely to survive this selective grazing pressure.
- **Afforestation** – extensive plantations on peatlands; fragmentation and isolation; firebreaks; self-seeding conifers, invasives, hydrological impacts; effects on wildlife assemblage; linkages with fire
- **Climate change** - Can impact fire intensity by triggering new extreme situations that are defined by long drought periods and warm temperatures, which severely reduce moisture content of peatland vegetation e.g. heathers/grasses/bog cottons/sedges. Based on modelling climate change impacts accelerate carbon losses, where increased burn severity and burn rate reduced the carbon sink by 38% in intact peatlands and 65% in degraded, respectively, by 2100. However, the study demonstrates the potential for active peatland restoration to buffer these impacts.

# Future prospects

## **Reducing the effects of fires and increasing resilience e.g. through improved habitat management e.g.**

- **Improving Hydrology:** Rewetting can improve habitat condition and ecosystem functioning. It increases the moisture content of the peat and of the vegetation, making it less vulnerable to drought, and therefore also to fire. Wetter vegetation impacts fire behaviour by reducing flame length and spread rate. Despite re-wetting still allowing fire spread in aerial plant parts as these are not covered by water, it limits the spread from aerial plants to the peat and therefore can prevent or limit smouldering fires. (A bog in good condition, like a person in their best health, is likely to be more resilient in the face of stresses and strains).
- **Improving Grazing:** Appropriate management to achieve characteristic peatland species and physical structure of vegetation. This will reduce peatland susceptibility to degradation from weather extremes (drought or rainfall) and from the range of other pressures including fire.
- **Fire Risk Management:** Risk assessments, forward planning, pre-emptive works, infrastructure, response, etc.

# All Saints Bog





# Marrying modern and traditional



O'Donoghue, 2022. IWM 140  
[www.npws.ie](http://www.npws.ie)

# Is burning then a tool in the toolbox?

**Why?** ~~Clear objectives~~ **Chainsaws and bandsaws are great tools too!**

only where suitable alternatives are not possible.

**Where?** Not bogs or wetlands

How to ensure not damaged. Environmental Assessment in SACs where possible. History of the site.

Assess likely impacts of burning. Baseline recording to a minimum to inform Adaptive Management.

**When?** Seasonality dependent

**How?** Know-how (skills)

**Who?** Trained, Experienced

**Task Force?**



objectives of site and burning or grazing are not possible.

for Appropriate alternatives. No alternatives available.

em services. Ensure providing feedback to every site is different.

c.

ortive Eco-System