

Ireland
8-9 March 2022

**Living Bog Closing
Conference
Clara Bog site visit**



An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

Clara Bog SAC (000572) (Co. Offaly) site visit

Topics:

- i. Raised bog habitat mapping & monitoring
- ii. Ongoing habitat losses
- iii. Setting of site-specific habitat targets

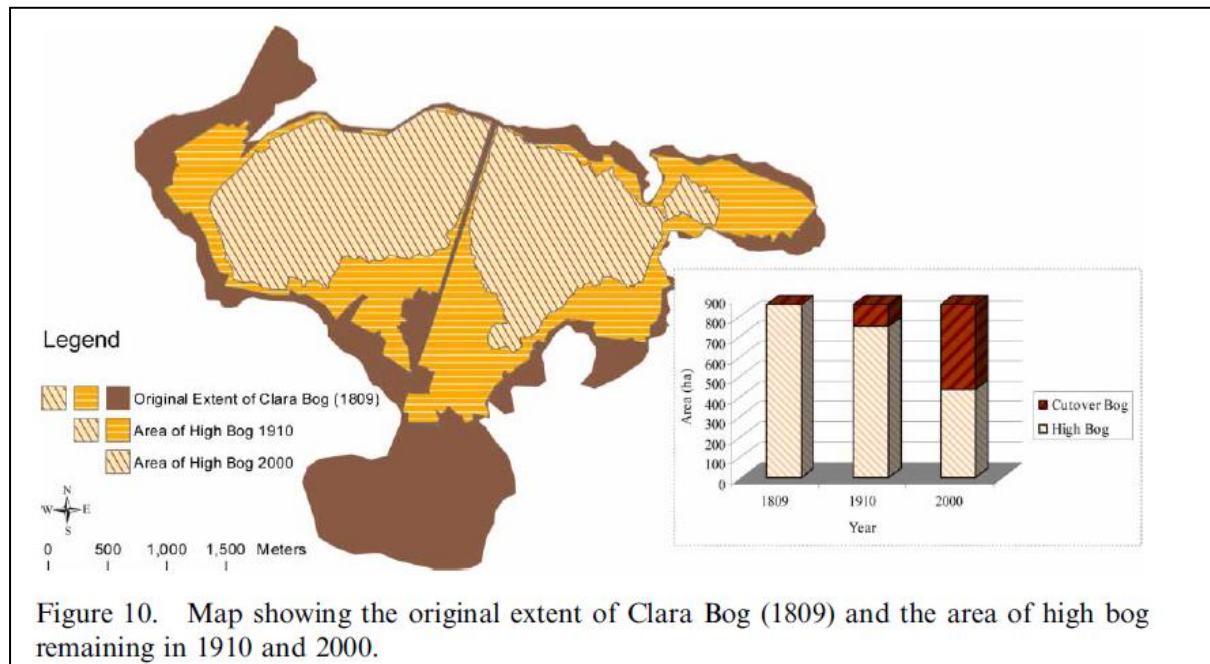
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Department of Housing, Local Government and Heritage

Raised bogs in Ireland basic statistics

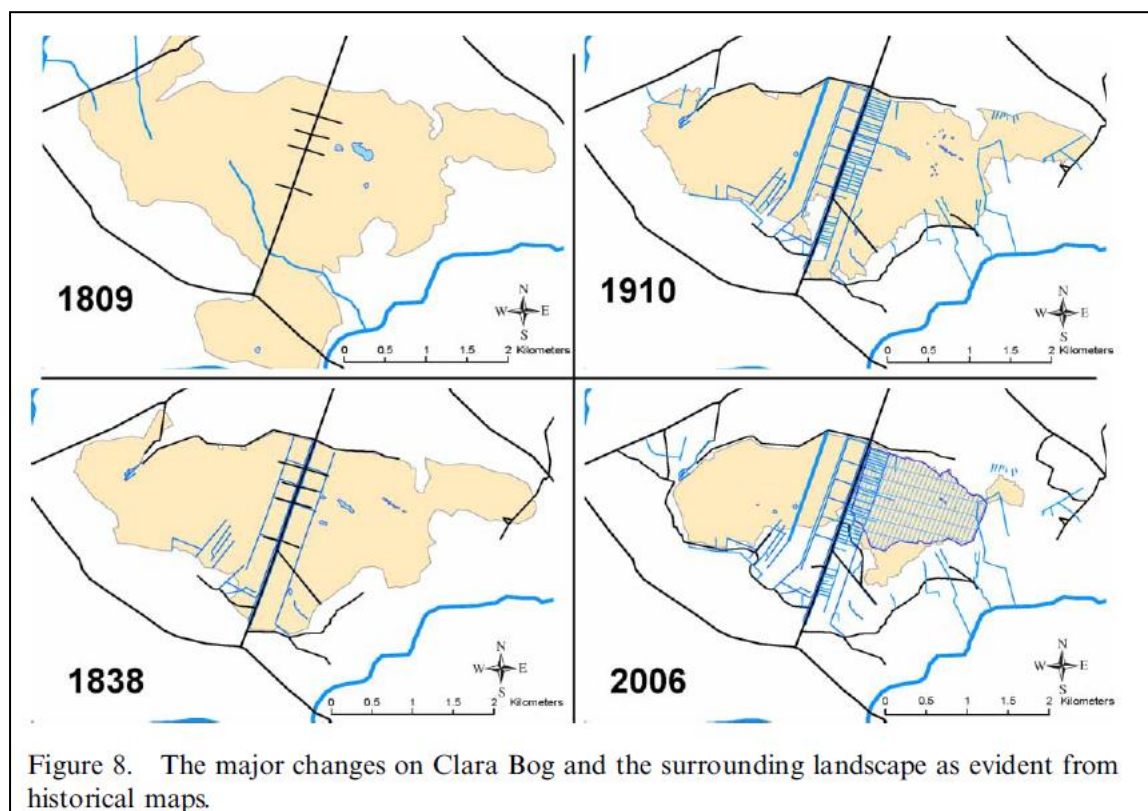
	Ireland 50% of remaining EU oceanic raised bogs	
	310,000 ha 1800s raised bogs resource	
	6% original resource within designated sites	
0.5% (1,659 ha) original resource currently active		c.a. 1% (3,600 ha) Active Raised Bog national target
1,014 ha Clara Bog 1800s extent	443 ha Clara Bog current high bog extent	102.1 ha currently active
Active Raised Bog 0.5 t CO₂ /ha/yr sink		Degraded Raised Bog 1.5 – 2.0 t CO₂ /ha/yr source

EU Habitats: 1) Active Raised Bog (7110); 2) Degraded Raised Bog (7120); 3) Bog woodland (91D0) & 4) Rhynchosporion depressions (7150)





Area of uncut bog – Original – unknown; 1809 – 1,014ha; Current - 443ha (44%)















The changing landscape of Clara Bog: The history of an Irish raised bog (Crushell et al, 2008)



i. Raised bog habitat mapping & monitoring- Ecotopes mapping

Not a typical floristic classification - physical characteristics (such as acrotelm depth) and hydrological attributes		
Five main ecotope types: <ol style="list-style-type: none"> 1. Central (7110) 2. Sub-central (7110) 3. Sub-marginal 4. Marginal 5. Facebank <div style="text-align: center;">  wetness </div>	Ecotopes	
	Community Complexes	
	Vegetation communities	
Advantages: <ol style="list-style-type: none"> 1. Monitoring - quantification of changes in habitat extent & quality 2. Setting of site specific and national targets 3. Impacts assessment 4. Assessment of GHG emissions (CO2) & assessment of changes in emissions 		

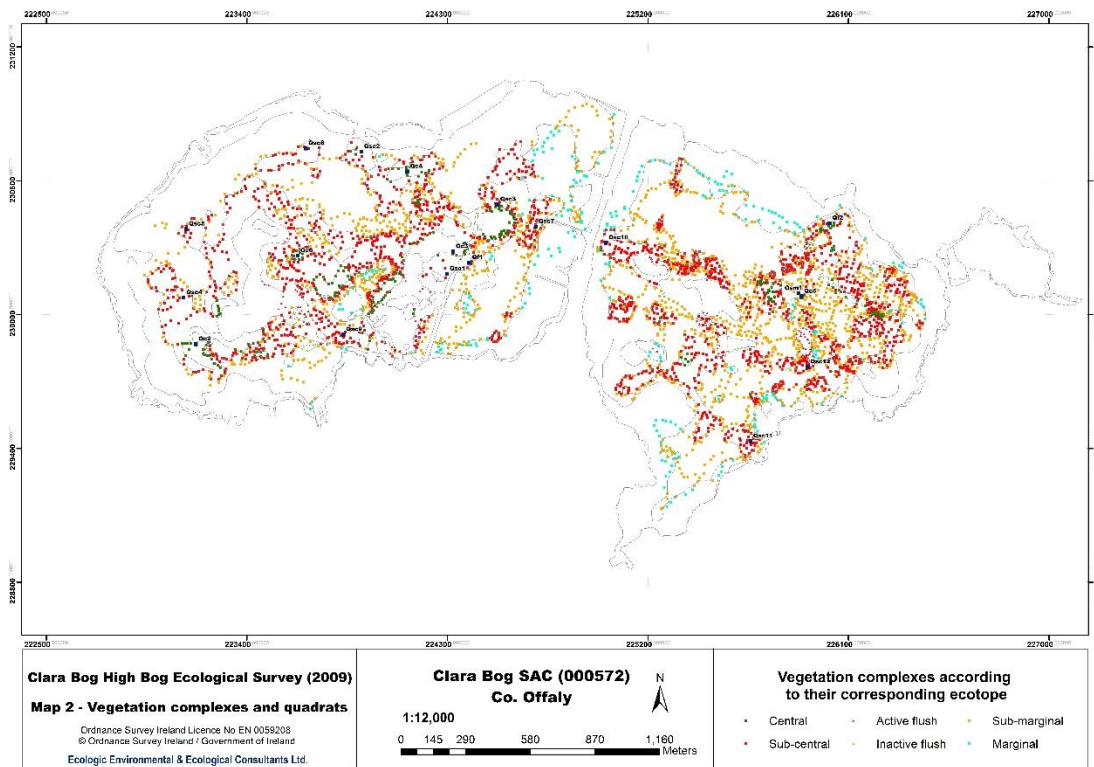
Concept developed by **Kelly (1993)**. Expanded by **Kelly & Schouten (2002)** and modified by **F. MacGowan** and published by **Fernandez *et al.* (2014)**.

Active Raise Bog		Non-active Raised Bog	
			
			
			

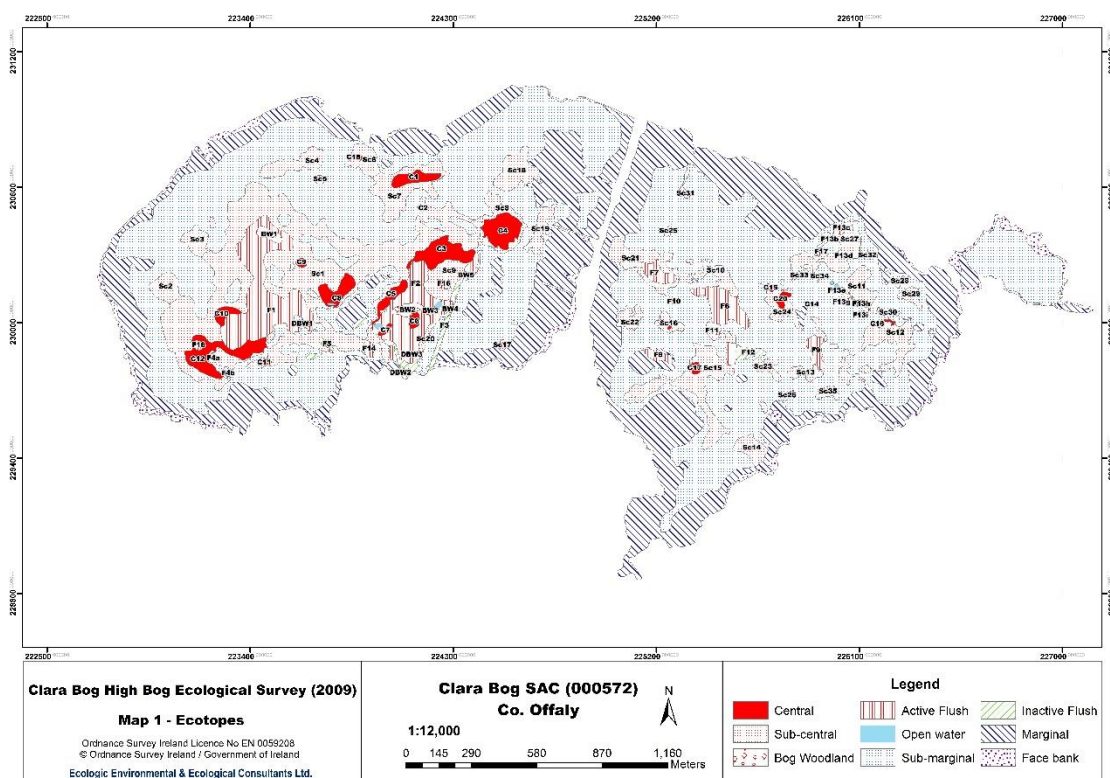
Survey specifications:

- Use of submeter accuracy GPS handheld computers
- Baseline data on the background
- Recording of community complexes point data; ecotope boundaries point data
- Quadrats (4 x 4 m); invasive species; impacting activities; photographs.

Clara 2009 vegetation survey – community complexes



Clara 2009 vegetation survey – ecotopes



ii. Ongoing habitat losses

Challenges:

- **Standardisation of surveys:** vegetation interpretation on the ground and of previous surveys data.
- **Essential to understand how impacting activities impact on the vegetation.** Always question whether the change is real or not.
- **Support assessment** with hydrological monitoring data (if available).

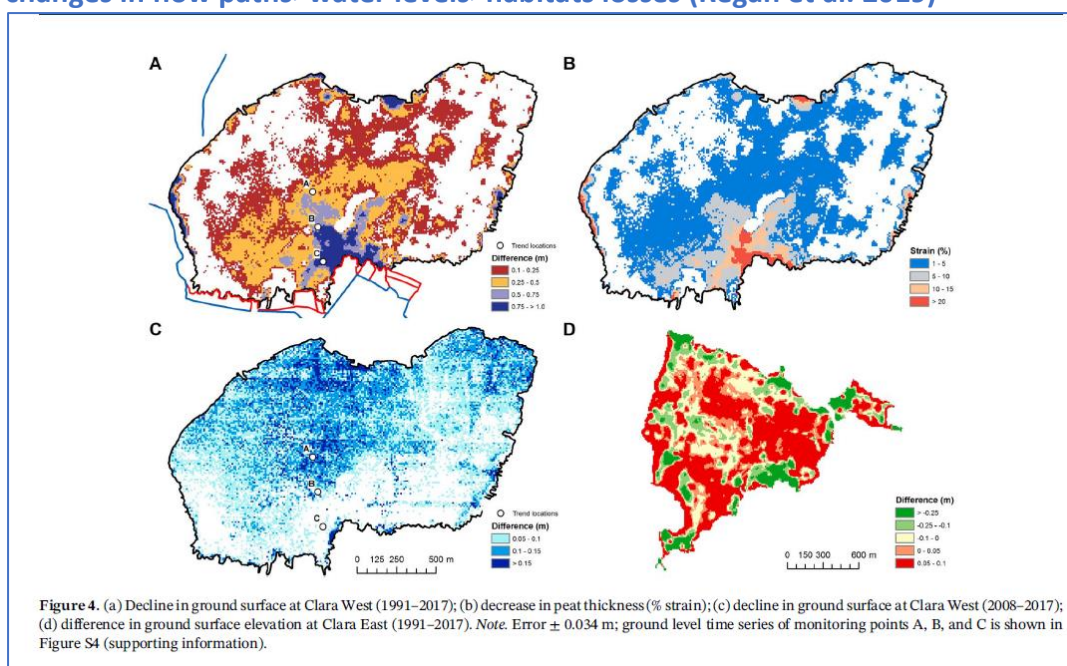
Overall changes in Active Raised Bog at Clara Bog

Year	Extent (ha)	Trend
1992	146.5	
2004	100.3	↓
2009	111.5	↑
2016	102.10	↓

Changes in Active Raised Bog

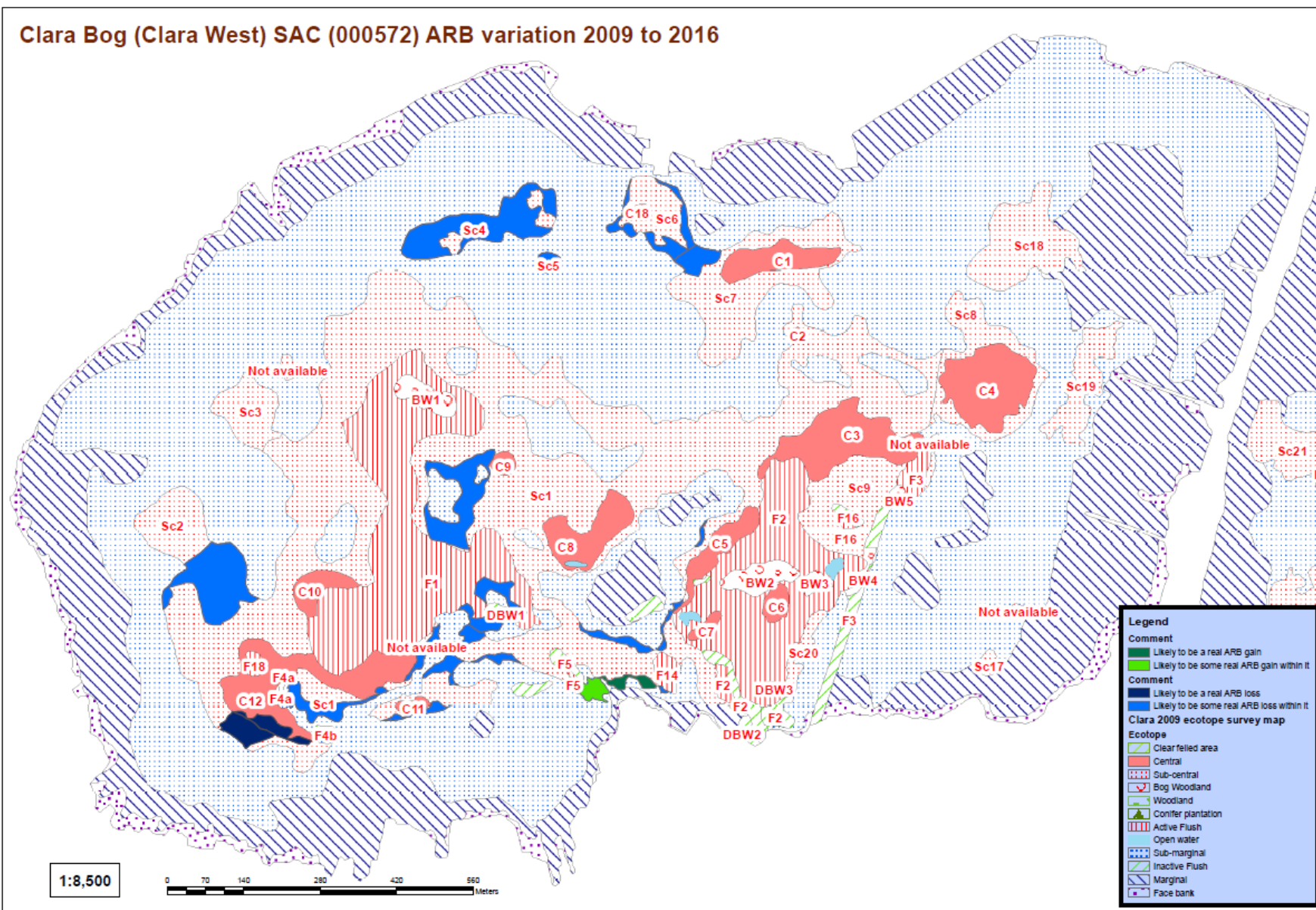
Period	Clara West(ha)	Clara East (ha)	Comment
1992 - 2004	(-) 37.16	(-) 8.97	None
2004 - 2009	(+) 13.17	(+) 1.86	Clara West: <ul style="list-style-type: none"> ▪ Overall increases as a result of restoration works. ▪ However, also losses along NW & small increases associated with subsistence along the S. ▪ Risk of irreversible losses identified.
2009 - 2016	(-) 9.78	(+) 0.39	Clara West: <ul style="list-style-type: none"> ▪ Overall decreases associated with marginal drainage on S cutover causing subsidence.

Regional groundwater dependent: Hydraulic groundwater heads changes>subsidence & changes in flow paths>water levels>habitats losses (Regan et al. 2019)



Importance of regional hydrostatic pressures

Clara Bog (Clara West) SAC (000572) ARB variation 2009 to 2016



iii. Setting of site-specific habitat targets

Eco-hydrological modelling based on the concept of **Potential Acrotelm Capacity** developed by van der Schaaf (2002) & van der Schaaf and Streefkerk (2002) and using LiDAR technology based on:

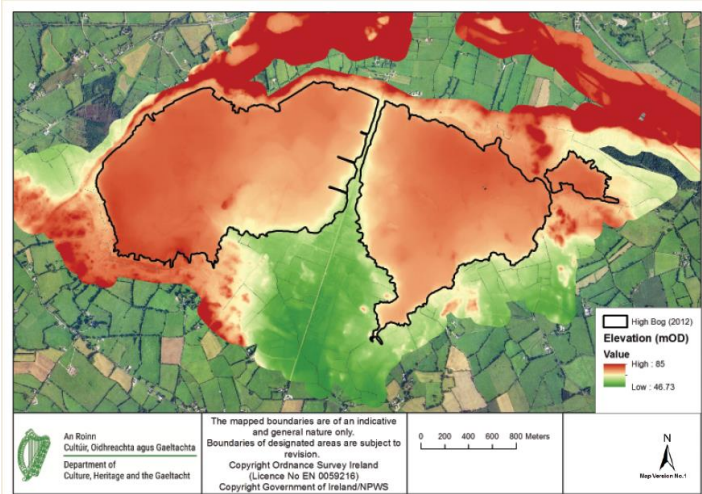
- raised bog's slope;
- drainage patterns and
- rainfall

Advantages:

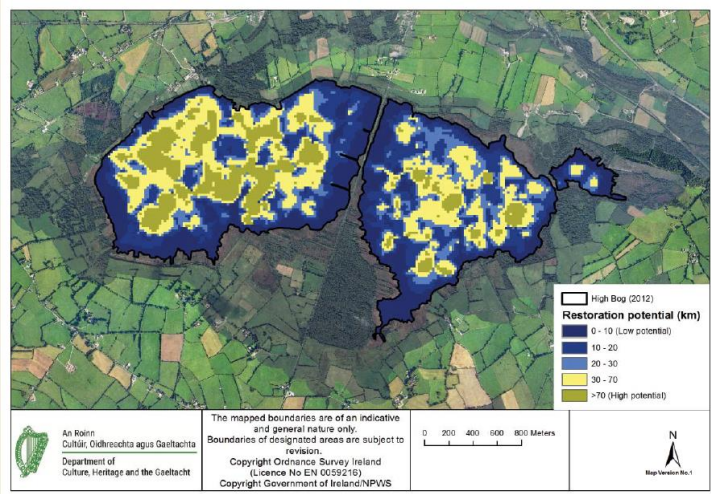
- **Determine the area** of each bog that has **suitable conditions for the development** (Degraded Raised Bog) **or occurrence of Active Raised Bog**.
- Establishment of **realistic/achievable site-specific & national targets**.
- More **effective** conservation of the national resource.
- **Efficient management** of financial & human resources.

Further information at Appendix 2 (NPWS, 2017)

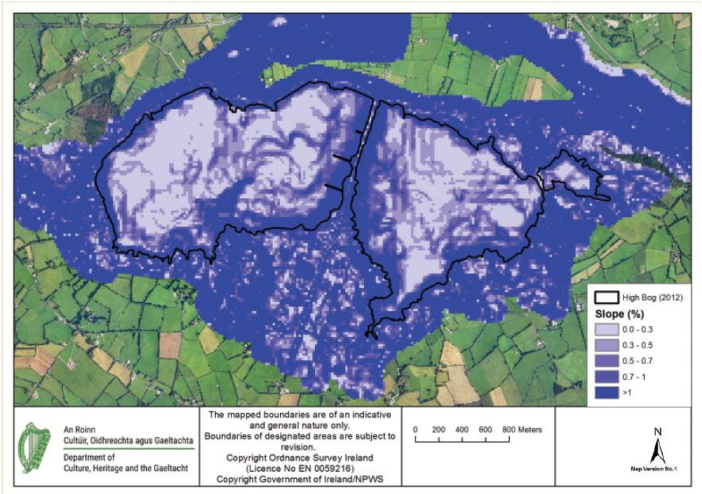
Clara Bog SAC - LiDAR imagery 2012



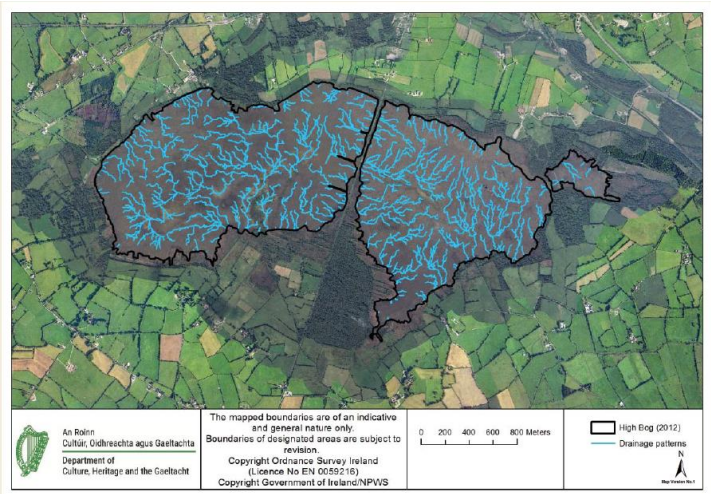
Clara Bog SAC – restoration potential



Clara Bog SAC - slopes derived from LiDAR



Clara Bog SAC – flow paths derived from LiDAR



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