

# Rewilding in Scotland: What Does it Mean?

Calum Brown

Rob McMorran, Martin Price

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University  
of  
St Andrews

## — REWILDING

- definition
- keystone species
- evidence

## — IN SCOTLAND

- extinctions
- reintroductions
- potential for rewilding

## — Why rewild?

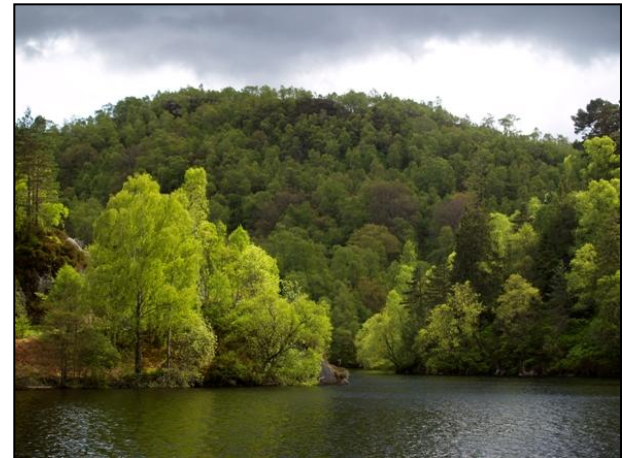
# Main Questions

## What is rewilding?

- scientific and philosophical basis

## Relevance to Scotland

- the 'de-wilding' of Scotland
- what rewilding would entail
- the case for rewilding



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# Definition of Rewilding

**“the scientific argument for restoring big wilderness  
based on the regulatory role of large predators”<sup>1</sup>**

1. Large ‘core’ reserves
2. Connectivity
3. Keystone species

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# Definition of Rewilding

**“the scientific argument for restoring big wilderness based on the regulatory role of large predators”<sup>1</sup>**

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Moral basis: rewilding justified “because of our duty to repair past mistakes in management” and repair anthropogenic damage<sup>2</sup>

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# Keystone Species

Species (often at top of food chain) which have disproportionate effect on their ecosystem relative to their abundance.

Stabilising effect of predation on competitive interactions well established <sup>3,4</sup>



Predator-prey interactions initiate beneficial 'trophic cascades' through community <sup>6</sup>

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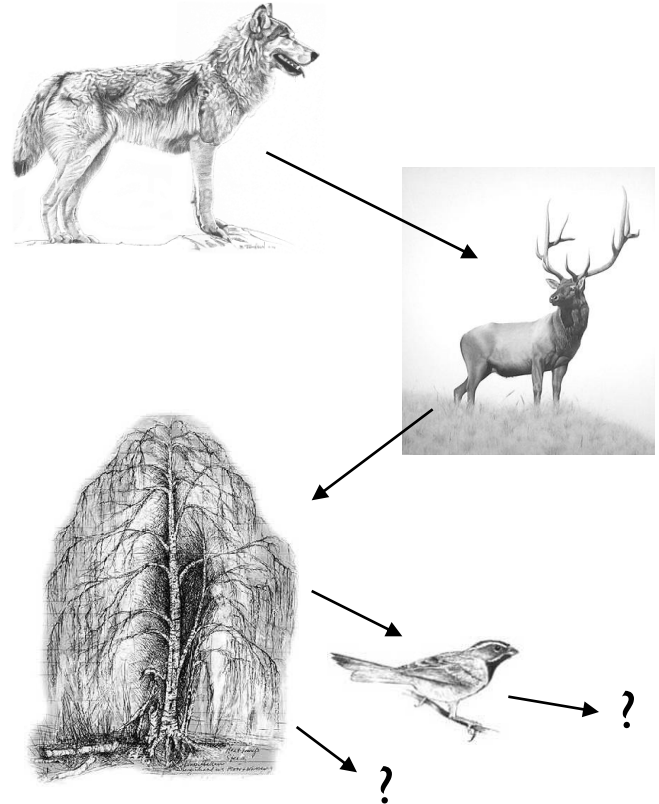
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# Evidence for Keystones

## Reintroduction and return of wolves to Yellowstone and Banff National Parks <sup>7,8</sup>



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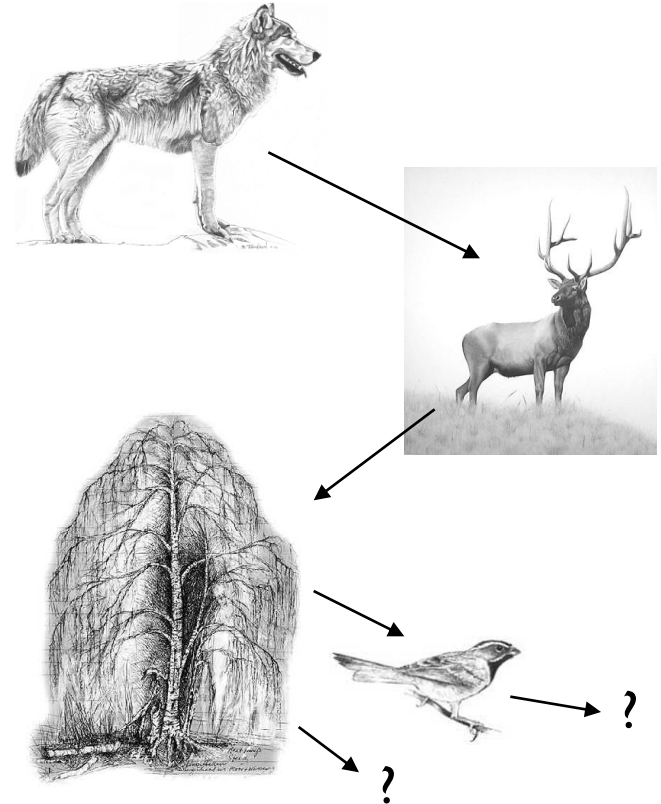
# Evidence for Keystones

Reintroduction and return of wolves to Yellowstone and Banff National Parks <sup>7,8</sup>

Observed in wide range of marine and terrestrial ecosystems <sup>9,10</sup>

Ecosystem structure resembles original state following return of keystone species

“sites with a fuller complement of apex predators often support a greater number of species, may be more productive, and deliver higher-quality ecosystem services” <sup>11</sup>





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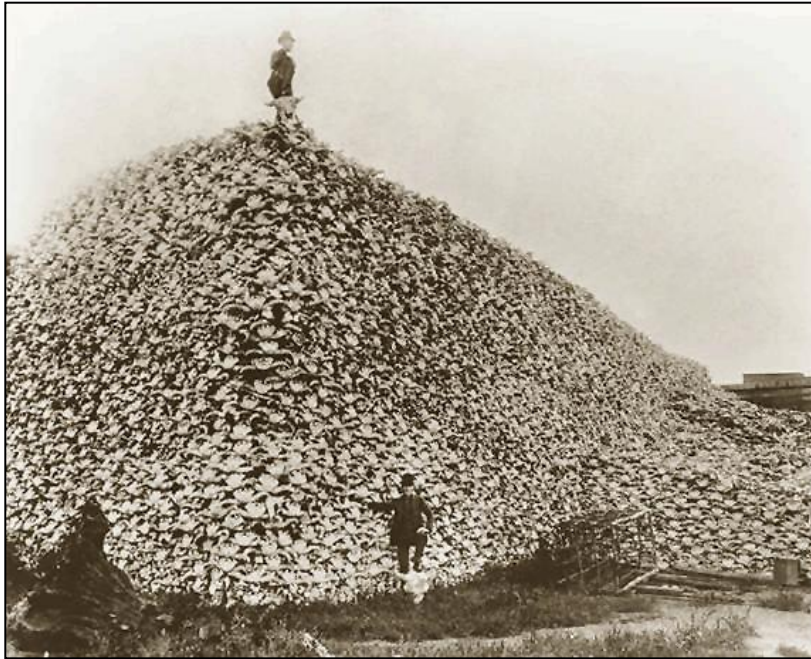
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# An American Concept?

North American extinctions very recent and clearly due to hunting, persecution or habitat destruction



Canadian Museum of Civilization

Do the same arguments apply in Scotland?



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# Rewilding in Scotland



## Relevance of rewilding:

- are we responsible for (keystone) species extinctions?
- could extinct species still function as keystones?
- can/should we reintroduce them?
- what else would rewilding entail?

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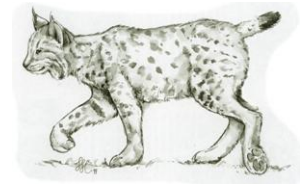
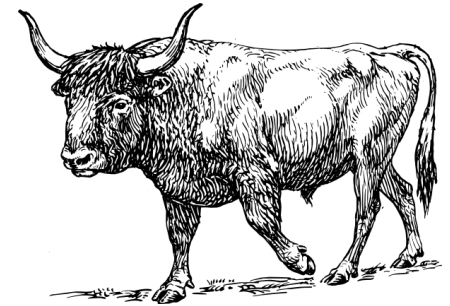
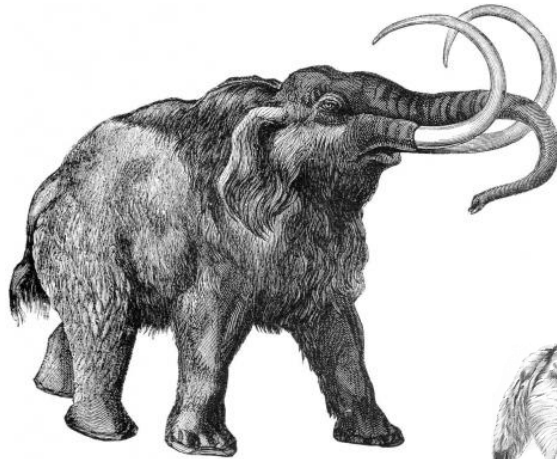
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# Scottish Megafauna

Numerous species extinct since end of last glaciation <sup>12</sup>



Some uncertainty over role of humans and climate change in extinctions

Similar loss of megafauna occurred worldwide following human arrival; not always coincident with climate change

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# Human Role in Extinctions

Some of the earliest detectable human activity related to agriculture<sup>13</sup>

Forest cover contracted from ~5000 BP as climate became warmer and wetter, and agricultural activity intensified<sup>14,15,16</sup>

Persecution of predators to protect livestock and expanding human population

Elk and Lynx among the first species almost certainly eradicated by human activity<sup>17,18</sup>

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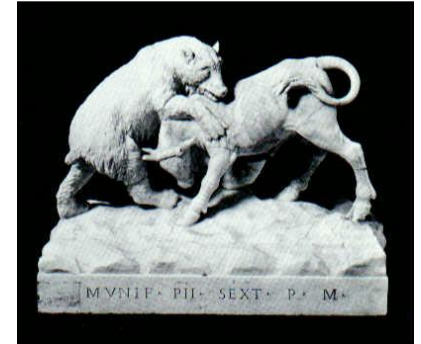
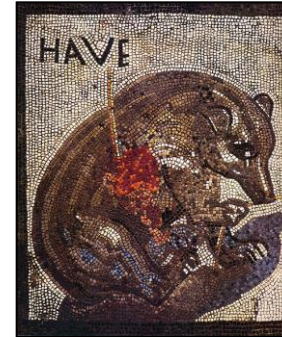
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# Extinctions Caused by Humans

Increasing evidence of persecution:

‘Caledonian bear’ hunted and used in Roman gladiatorial contests <sup>19</sup>



Wolves “effectively extirpated” by hunting and “cutting down or burning whole tracts of the forests which harboured them” <sup>20</sup>

Other species (e.g. Aurochs) suffered from hunting and habitat loss

Increasing intervention with large-scale sheep farming and sporting estates



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	Date of Extinction	Probable Causes of Extinction
<b>Elk</b>	after 4,000 BP	Hunting; Habitat Loss
<b>Auroch</b>	after 2,000 BP (?)	Hunting; Habitat Loss
<b>Lynx</b>	after 1,800 BP	Hunting; Persecution; Habitat Loss
<b>Brown Bear</b>	10 <sup>th</sup> Century (?)	Hunting; Persecution; Habitat Loss
<b>Crane</b>	after 15 <sup>th</sup> Century	Habitat Loss; Hunting
<b>White Stork</b>	15 <sup>th</sup> Century	Habitat Loss
<b>Beaver</b>	16 <sup>th</sup> Century	Hunting; Habitat Loss
<b>Great Bustard</b>	16 <sup>th</sup> Century	Habitat Loss; Hunting
<b>Wild Boar</b>	17 <sup>th</sup> Century (?)	Hunting; Habitat Loss
<b>Wolf</b>	17 <sup>th</sup> Century	Hunting; Persecution; Habitat Loss
<b>Capercaillie</b>	18 <sup>th</sup> Century	Habitat Loss; Hunting
<b>Great Auk</b>	19 <sup>th</sup> Century	Habitat Loss; Hunting
<b>Bittern</b>	19 <sup>th</sup> Century	Habitat Loss; Hunting
<b>Red Squirrel</b>	19 <sup>th</sup> Century (?)	Habitat Loss
<b>Great Spotted Woodpecker</b>	19 <sup>th</sup> Century	Habitat Loss; Hunting
<b>Red Kite</b>	20 <sup>th</sup> Century	Persecution
<b>Goshawk</b>	20 <sup>th</sup> Century	Persecution
<b>Spotted Crake</b>	20 <sup>th</sup> Century	Habitat Loss
<b>Polecat</b>	20 <sup>th</sup> Century	Persecution
<b>Osprey</b>	20 <sup>th</sup> Century	Persecution
<b>Sea Eagle</b>	20 <sup>th</sup> Century	Persecution

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# Moral Case

Do we have a responsibility to reintroduce extinct species?

Obligated by European legislation (1979 Bern Convention & 1992 Habitats Directive) to consider feasibility of reintroductions

Cultural considerations:

lack of true wilderness and utilitarian view of natural environment;

loss of agriculture associated with cultural decline<sup>22</sup>



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# Are Reintroductions Possible?

Have environments ‘moved on’?

large-scale deforestation;

adaptation of remaining flora and fauna;

human land use



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# Are Reintroductions Possible?

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Species not absent for ecologically significant timescales<sup>23,24</sup>

Reforestation a pre-requisite for some species (e.g. bear) but viable populations of others (e.g. beaver<sup>26</sup>, lynx<sup>27</sup>, wolves<sup>28</sup>) are possible and would aid environmental recovery

Public attitudes reasonably favourable & effects on agriculture may be minimised

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# Rewilding and Conservation

Is rewilding compatible with other conservation and restoration strategies?

Potential problems:

- lack of management perceived as unhelpful in Scotland
- reintroduction of species impractical and distracting?
- strict protection of large areas difficult

Areas of agreement:

- restoration of natural habitats and native woodland
- primacy of natural processes
- socio-economic benefit?

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# Why Rewild?

## Ecological justification:

Scottish environment remains adapted to the presence of keystone species; productivity and diversity would increase; costly human management would be unnecessary

## Aesthetic justification:

Benefits associated with access and enjoyment of wild land and attraction of 'self-willed' environment

## Philosophical justification:

Gives cogency and context to conservation projects; defined objective of complete ecosystem

“our goal should not be to eliminate any traces of human use or effect...this is impossible. Instead, our goal should be to restore the primacy of natural forces”<sup>25</sup>

“a cynic might describe rewilding as an atavistic obsession with the resurrection of Eden. A more sympathetic critic might label it romantic. We contend, however, that rewilding is simply scientific realism”<sup>1</sup>



Thank You



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