Regenerating landscapes with adaptive time controlled shift grazing

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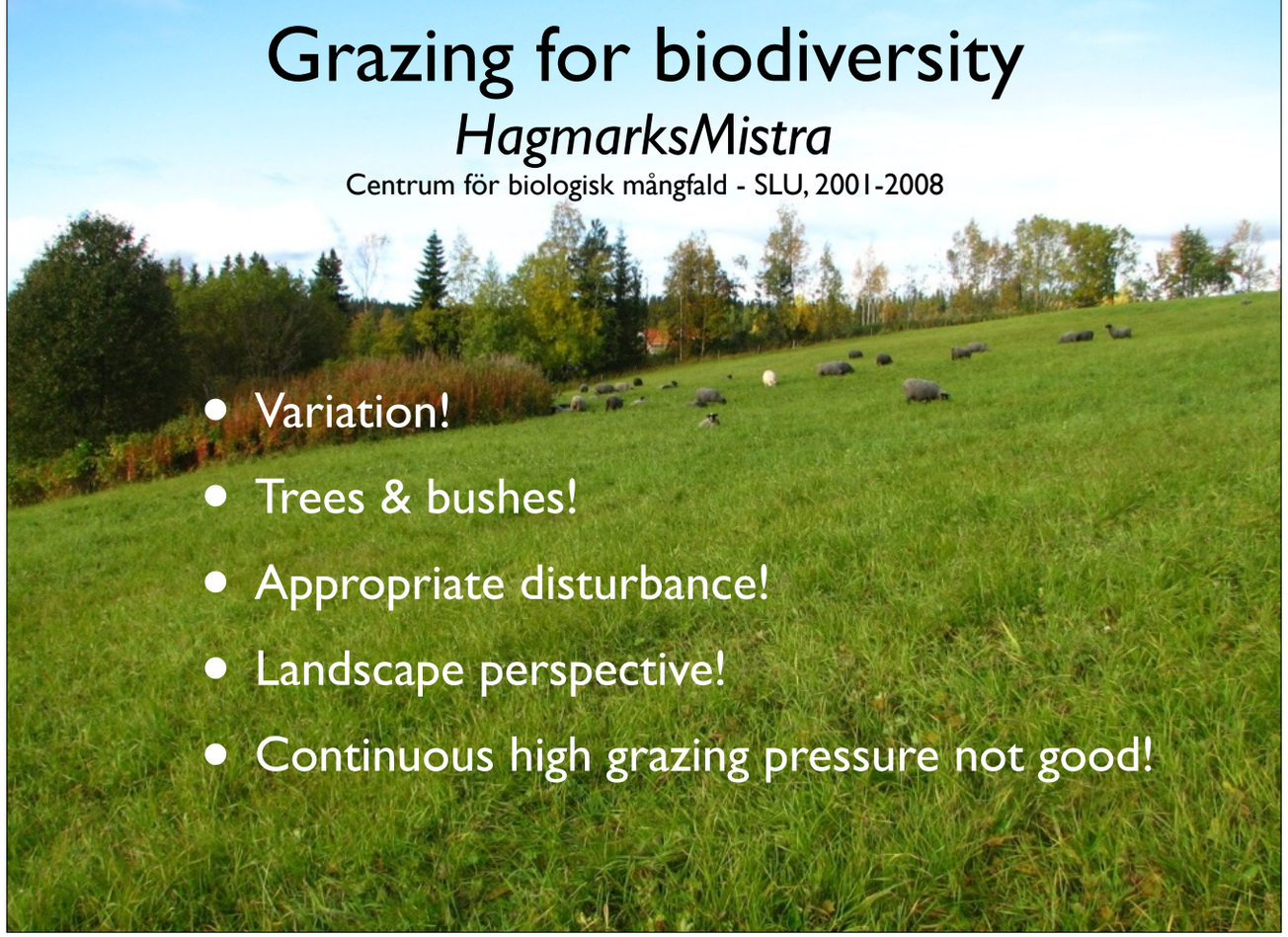
This presentation is a collaboration between the Nordic and the Patagonian Hub of the Savory Network.

We probably can agree that grazing animals have impacts on the land - That's why we are here in Iceland.

One question is: To which extent can, and should we control these impacts? Could this make the grazing more environmentally sustainable as well? Let’s have a look!

There is a need for grazing management for many different reasons: protecting biodiversity, erosion control, water management, weed and brush control, and so on. Much biodiversity are dependent on grazing animals, and livestock are therefore included in the management toolbox for biodiversity management, especially on land with a long history of livestock farming.



Much is known about the needs of plants and wildlife, but the knowledge of practical grazing management is usually lacking.

10 cow-calf pairs + 1 bull
continuous grazing

600+ steers
1 week grazing

Grazing for biodiversity - how do we get the right impact?

The result is often grim, like in this nature reserve here to the left, contrasted with much better management to the right.

A growing number of farmers around the world uses time controlled shift grazing with proactive adaptive management to regenerate their land. This is very often the management framework called Holistic Management, and its Holistic Planned Grazing protocol. Some of these farmers have become well known for their impressive work. Joel Salatin and Gabe Brown in the US, Colin Seis in Australia, are some of those that have become role models for other progressive farmers.

By regenerate land I here include: To sequester carbon, build soil, improve water management, increase productivity, manage weeds, enhance biodiversity and more.
Also organizations around the world are demonstrating the power of this concept.

The Africa Centre for Holistic Management i Zimbabwe are a learning site where people from all over the world come to see and learn, as well as the local communities. But most famous might be IRDNC in Namibia, that have been implementing a spectacular turnaround for Namibian land management.

The Nature Conservancy have several conservation projects where they cooperate with holistic management ranchers, also with my partner today Ovis21.

Even in the Nordic countries there is now a small group of farmers practicing adaptive management with time controlled shift grazing. Here Fjällbete in the community of Åre in Sweden.

Rotational grazing

↓

Time controlled shift grazing: *'Rational grazing'*

Voisin, André 1959 «Grass productivity»

↓

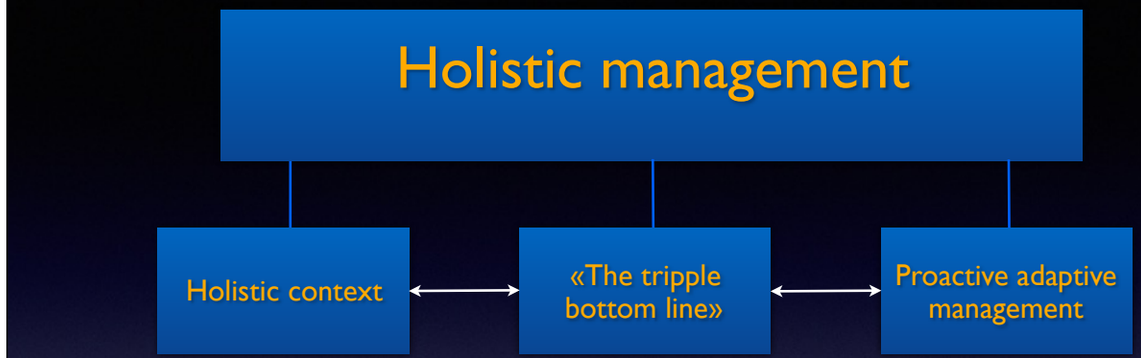
Time controlled shift grazing + animal impact: *'Mob grazing' etc.*

↓

Time controlled shift grazing + animal impact + ecosystem processes + social & economic context: *'Holistic planned grazing'*

Savory, Allan & Butterfield, Judy,1995: «Holistic Management. A new framework for decision making.»

The idea of moving animals regularly to give them fresh feed and to spread the impact is as old as grazing. But that time management is key to plant recovery, productivity and species composition is not as obvious. Rotation is just not enough. Voisin stated that all grazing should be time controlled, with regards to grass recovery time and stages at which plants are grazed, and in an adjustable manner, according to how the season is: That is shift grazing instead of rotation.
The African biologist Allan Savory picked up this idea while working with deteriorating savanna in Rhodesia in the 1960s. To get similar results in the very brittle seasonal dry environment of Africa, he had to add animal impact to the management toolbox and monitor the effects on the major ecosystem processes. Later he also recognized the need for a more holistic perspective, and added the social and economic aspects of the management into the planning framework. Savory also stresses the need to be 'proactive' and monitor for effects you don't want.



Savory, Allan & Butterfield, Judy, 1995: «Holistic Management. A new framework for decision making.»

Although the elements of Holistic Management are not new to science, and although it fits well into the general concept of ‘adaptive management’, rangeland science has in general overlooked this practice and often shunned its results as anecdotal. Also it is being closely linked to dry and desertifying areas of the world, with little relevance in the more humid regions.

Continuous or shift grazing?

«Achieving sustainability on rangelands depends upon animals frequently moving across landscapes, whether driven by their nutrient needs, predators, herders, fire, or fenced paddocks.»

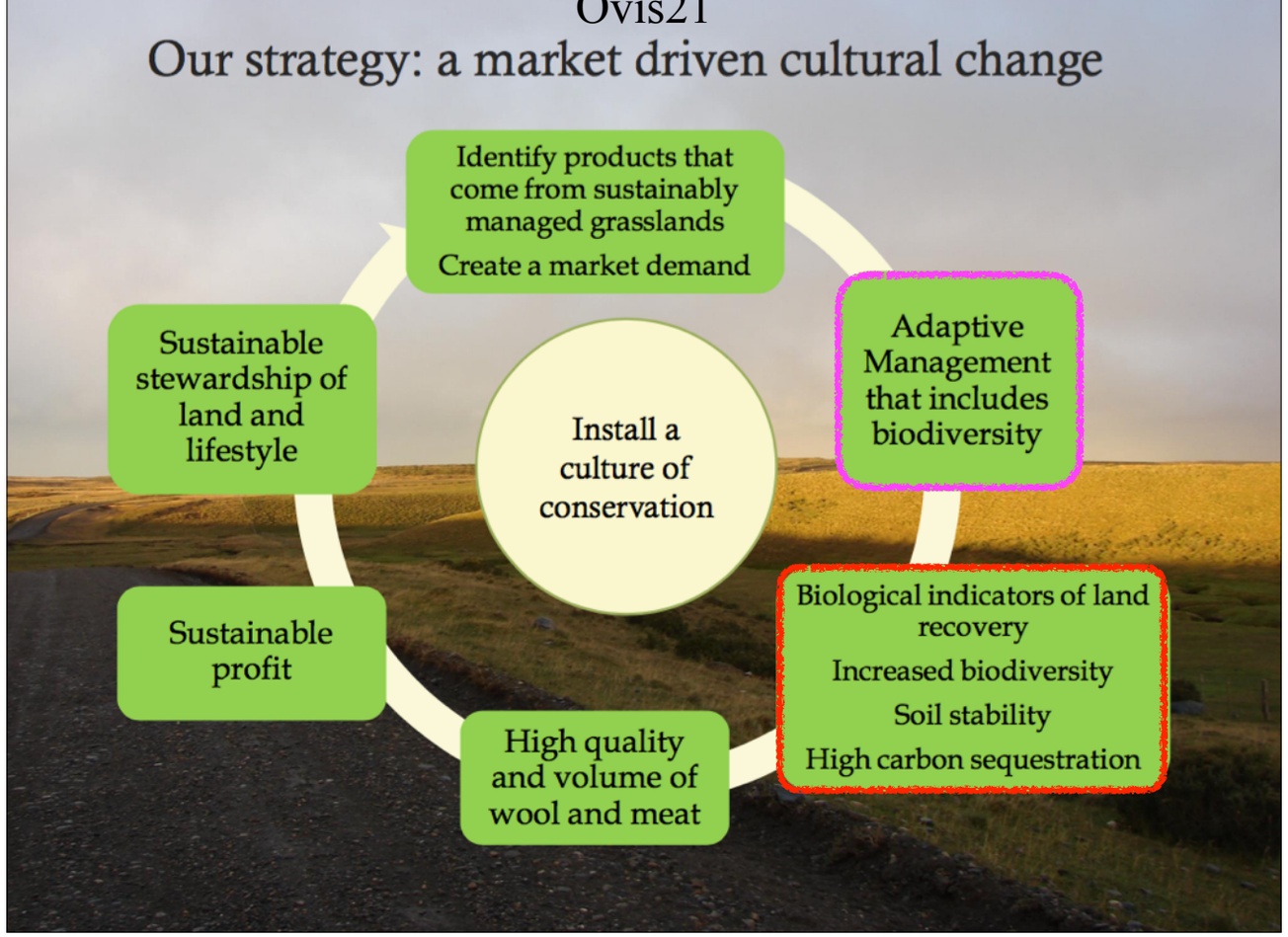
Teague, Provenza, Kreuter, Steffens, Barnes 2013 Multi-paddock grazing on rangelands: Why the perceptual dichotomy between research results and rancher experience? Journal of Environmental Management 128 (2013), 699-717

However, positive and similar results on the ground in very diverse environments points to universalities that should not be ignored, but instead be investigated.

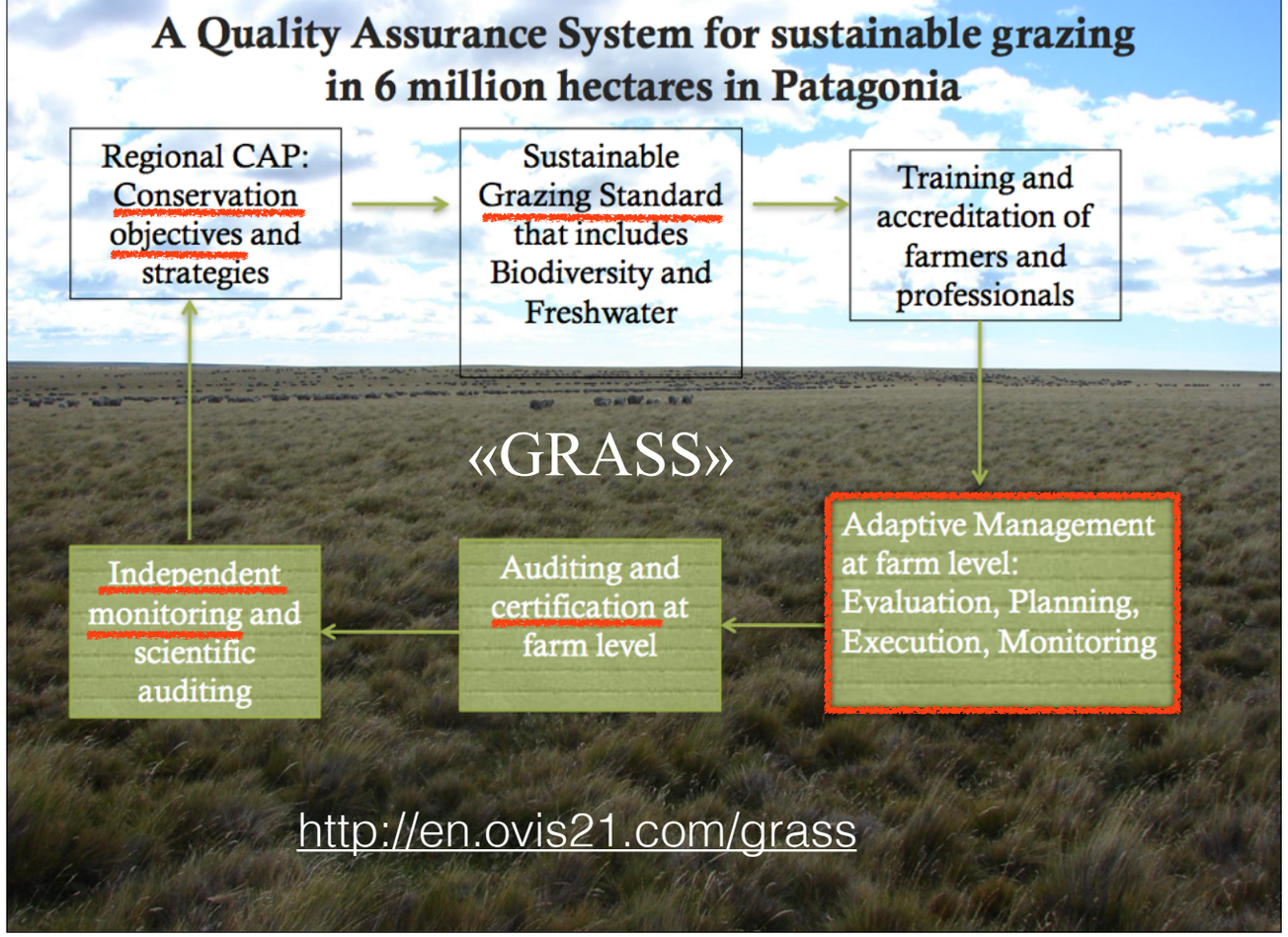
The effects of management is often striking, but does it really work?

Proactive adaptive management with time controlled shift grazing in Patagonia

Let’s look at an example from the Patagonia region of Argentina and Chile: Ovis21 – a network of producers and professionals.



They have developed a market driven system for sustainable production of wool.



An important part of this is an advanced evaluation and certification program for grassland/rangeland management that documents management effects on the land: GRASS (Grassland Regeneration and Sustainable Standard).

This is inspired by the Inta Santa Cruz ag. extension service of the 1980'ies, modified by Ovis21, and then strongly influenced by Holistic Management. Collaboration with The Nature Conservancy then incorporated relevant biodiversity conservation. Today this standard is considered the most advanced that exists, and is currently being adapted for use in other parts of the world.

Adaptive management at the farm level is of course the key implementation. Both farms doing Holistic Management and farms doing only basic planning are welcome to participate in the program.

Key outcome Indicators

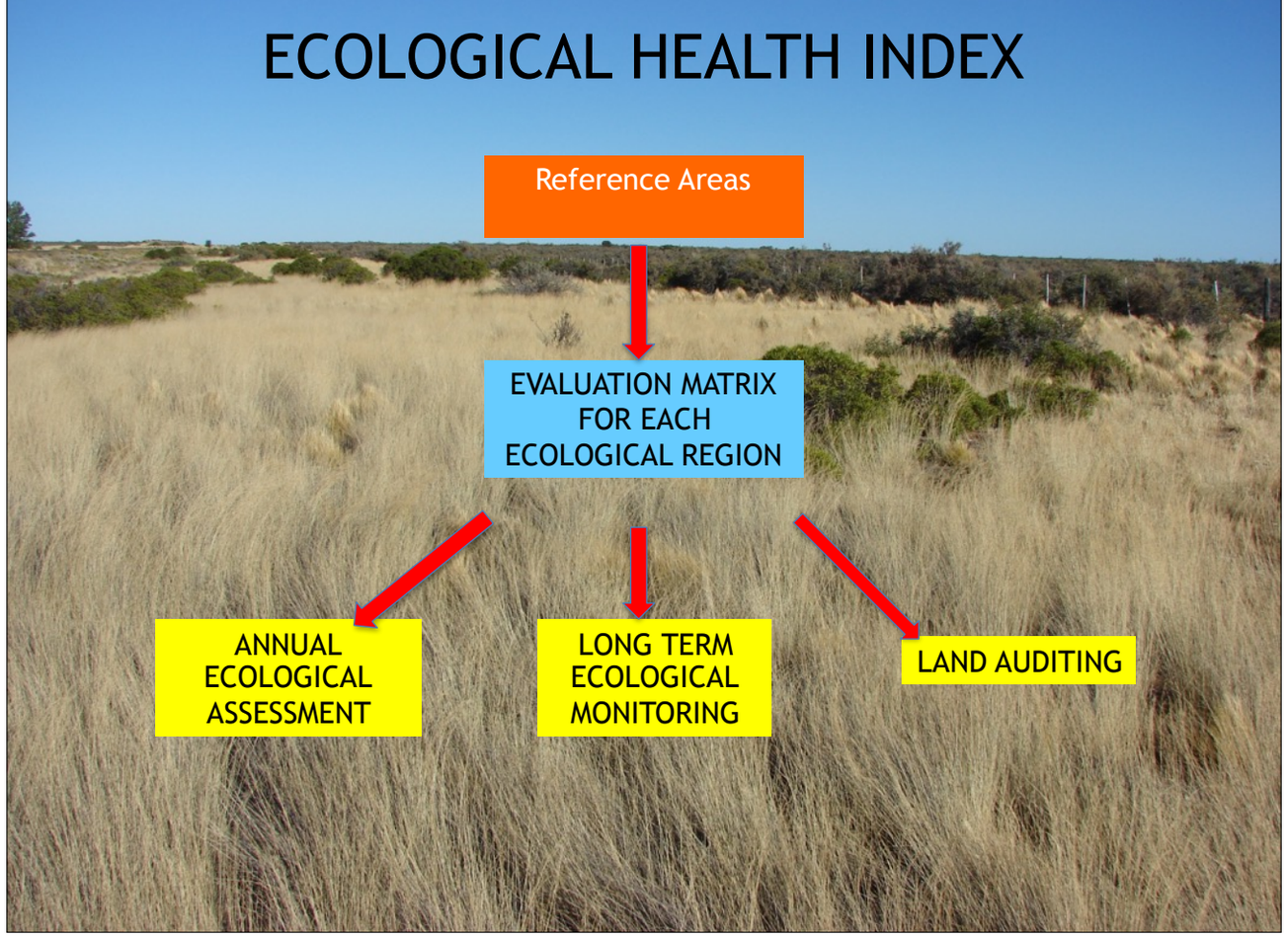
Short term evaluation

Long term monitoring (slow variables)

Attribute	Leading Indicators	Lagging Indicators
Soil and Vegetation	Ecological Health Index (Several biological Indicators) Procedure B.2	Soil Organic Matter Total vegetation cover Biodiversity Indexes Forage Productivity Procedure B.4
Livestock Production	Forage availability Procedure B.2 Body Condition Pregnancy Diagnosis Procedure B.6.	Herd Productivity Procedure B.6.
Wildlife Population	Abundance Index % of juvenile individuals	Population density estimations

Monitoring is an important step in the process. One measures key outcome indicators - some «leading» short term indicators and some «lagging» long term indicators.

It is important that this is management relevant and not too costly in time and money.



An Ecological Health Index (EHI) was proposed based on widely accepted biological indicators. It is based on the Rangeland Health Index used in the US.

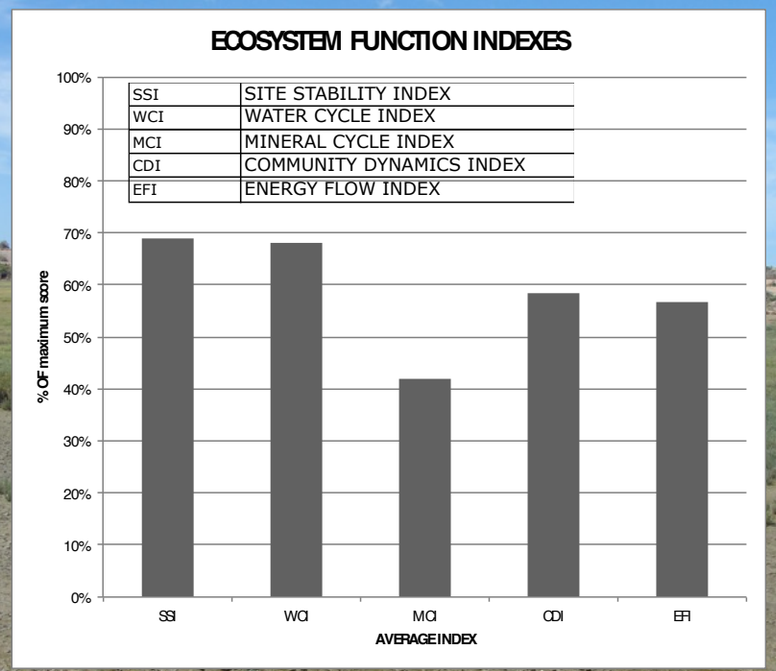
Ecological Health Index Indicators:

NUM.	INDICATOR	UNIT	Source	Type
1	BARE SOIL	% Cover	4,5,6,7,8	Ref. Area
2	LITTER ABUNDANCE	% Cover	4,5,6,7,8	Ref. Area
3	CAPPING	Crust Hardiness	4,5,6,7	Absolute
4	WIND EROSION	Blowout / Deposition	4,5,6,7,8	Absolute
		Active pedestals	4,5,6,7,8	Absolute
5	WATER EROSION	Rills/water flows	4,5,6,7,8	Absolute
		Gullies	4,5,6,7,8	Absolute
6	LITTER INCORPORATION	Litter type, Soil contact	4,5,6,7,8	Absolute
7	LIVING ORGANISMS	Evidence of microfauna	4,8	Absolute
8	DUNG DECOMPOSITION	Dung Dissapearance rate	4,8	Absolute
9	Functional Group 1	Vigour, reproduction, crown integrity	4,5,8	Absolute
10	Functional Group 2	Vigour, reproduction, crown integrity	4,5,8	Absolute
11	Functional Group 3	Vigour, reproduction, crown integrity	4,5,8	Absolute
12	Context. Desirable RARE SPECIES?	Frequency	4	Ref. Area
13	Context. Undesirable species	Abundance	4,5,8	Ref. Area
14	LIVE CANOPY ABUNDANCE	Total green Biomass production / Site potential	4,5	Ref. Area

4 Borrelli et al 2011
5 Pellant et al 2005
6 Savory and Butterfield, 1988
7 Tongway and Hindley,
8 Gardzia and Graham

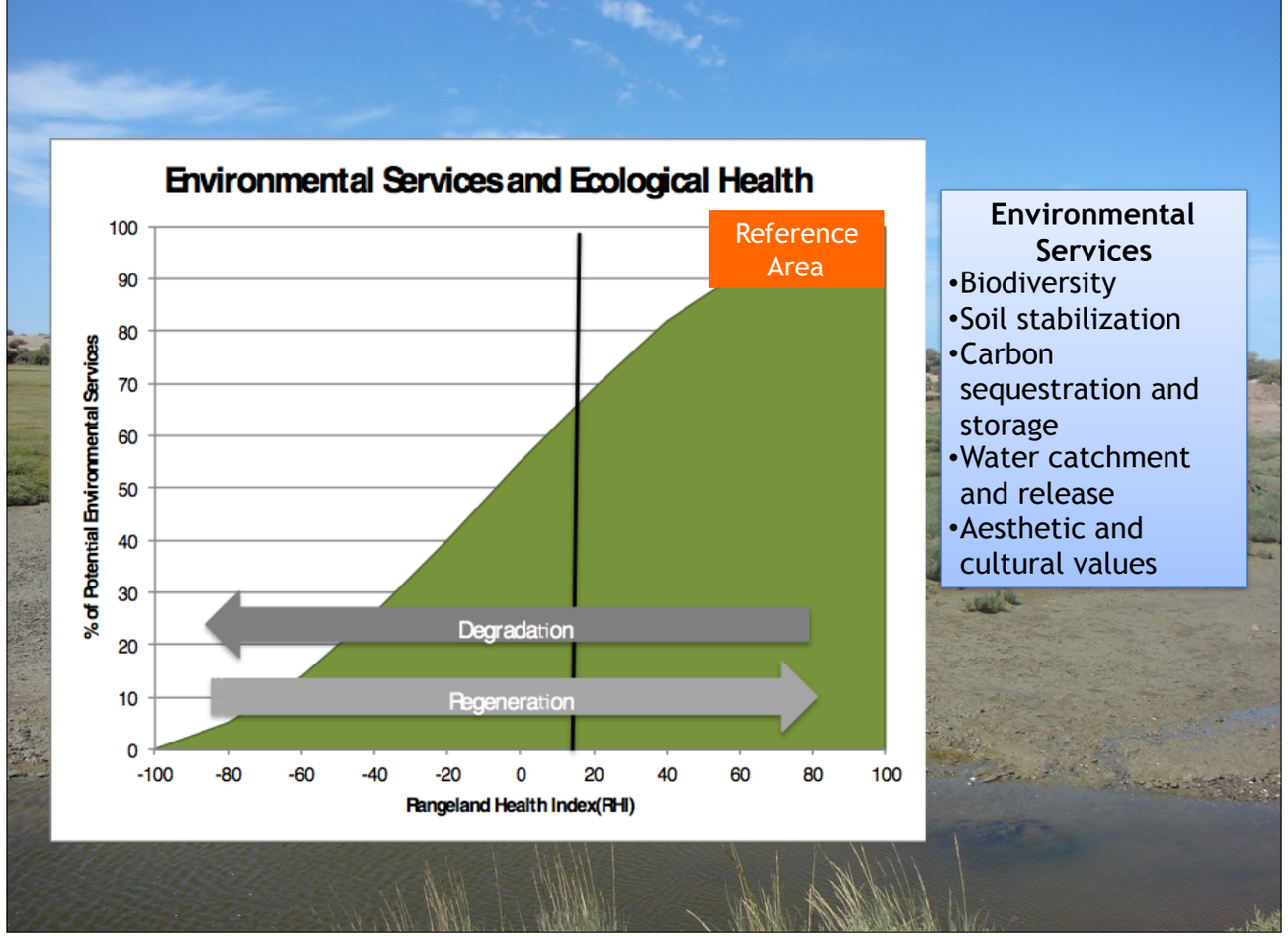
Indicators are chosen that can tell about important conditions and ecosystem processes.

ECOLOGICAL HEALTH INDEXES



Fuentes: Borrelli and Oliva 2001; Tongway and Hindley 2004; Pellant et al. 2005; and Gardzia and Graham 2009

This gives us a picture of ecosystem function.

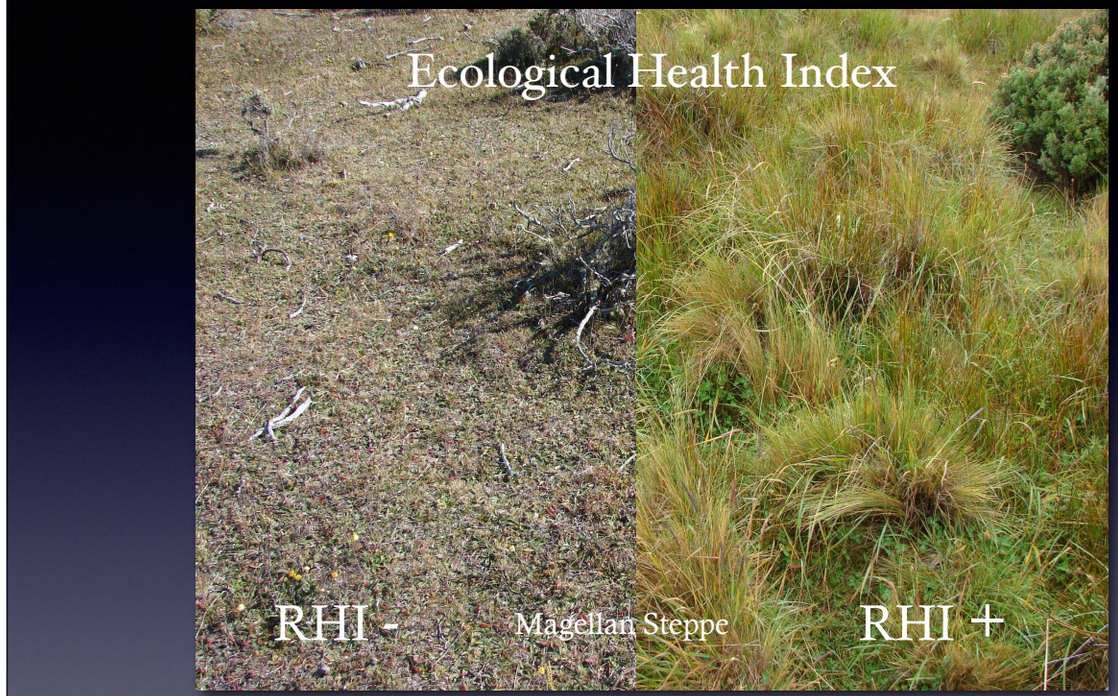


Environmental Services

- Biodiversity
- Soil stabilization
- Carbon sequestration and storage
- Water catchment and release
- Aesthetic and cultural values

Farms to the right of the black line are considered «regenerative», while farms to the left are considered «restorative». A reference area are chosen for the best known condition.

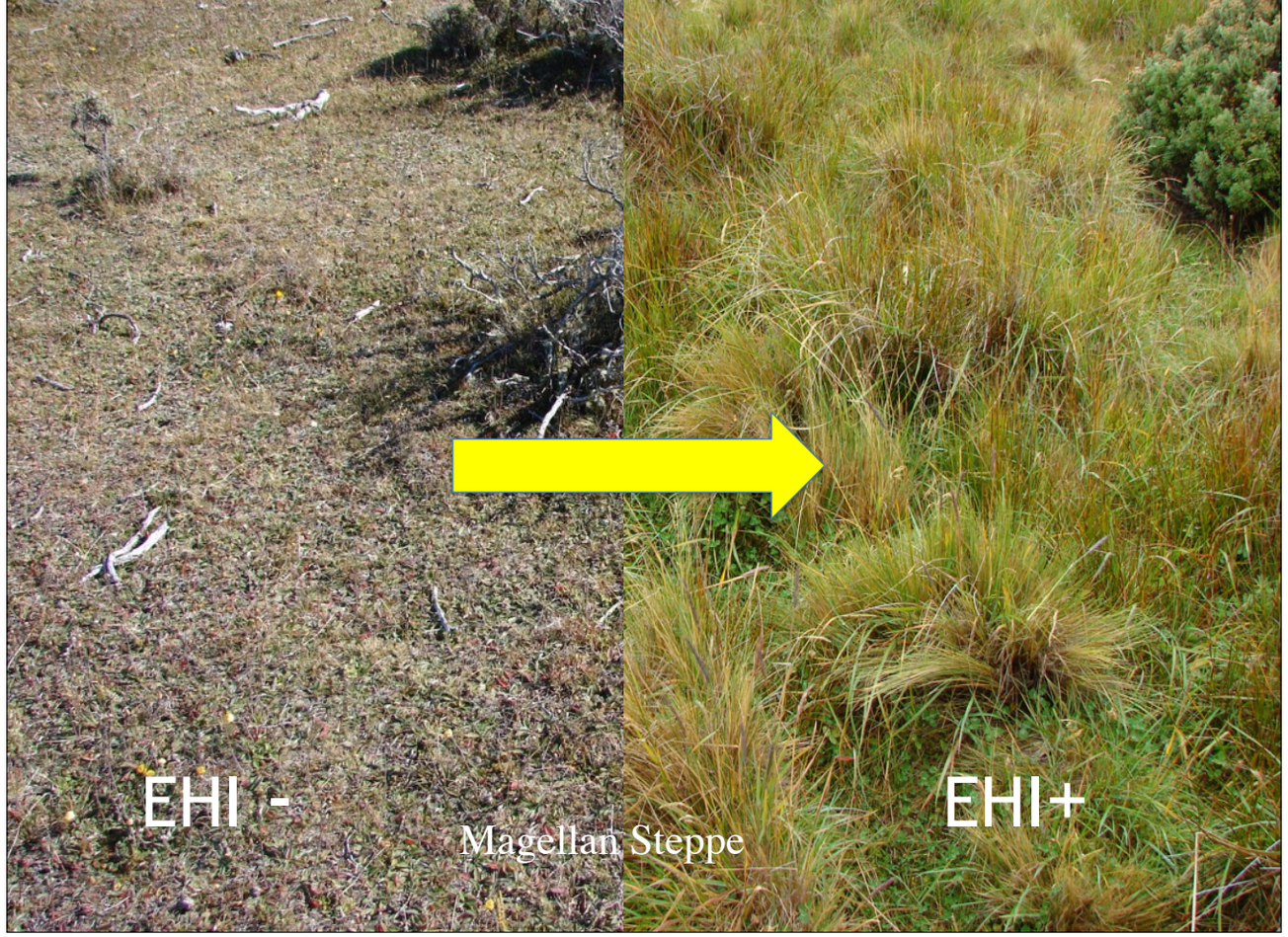

Reference Area
The best known expression of biodiversity, site integrity and ecosystem function in an ecological region



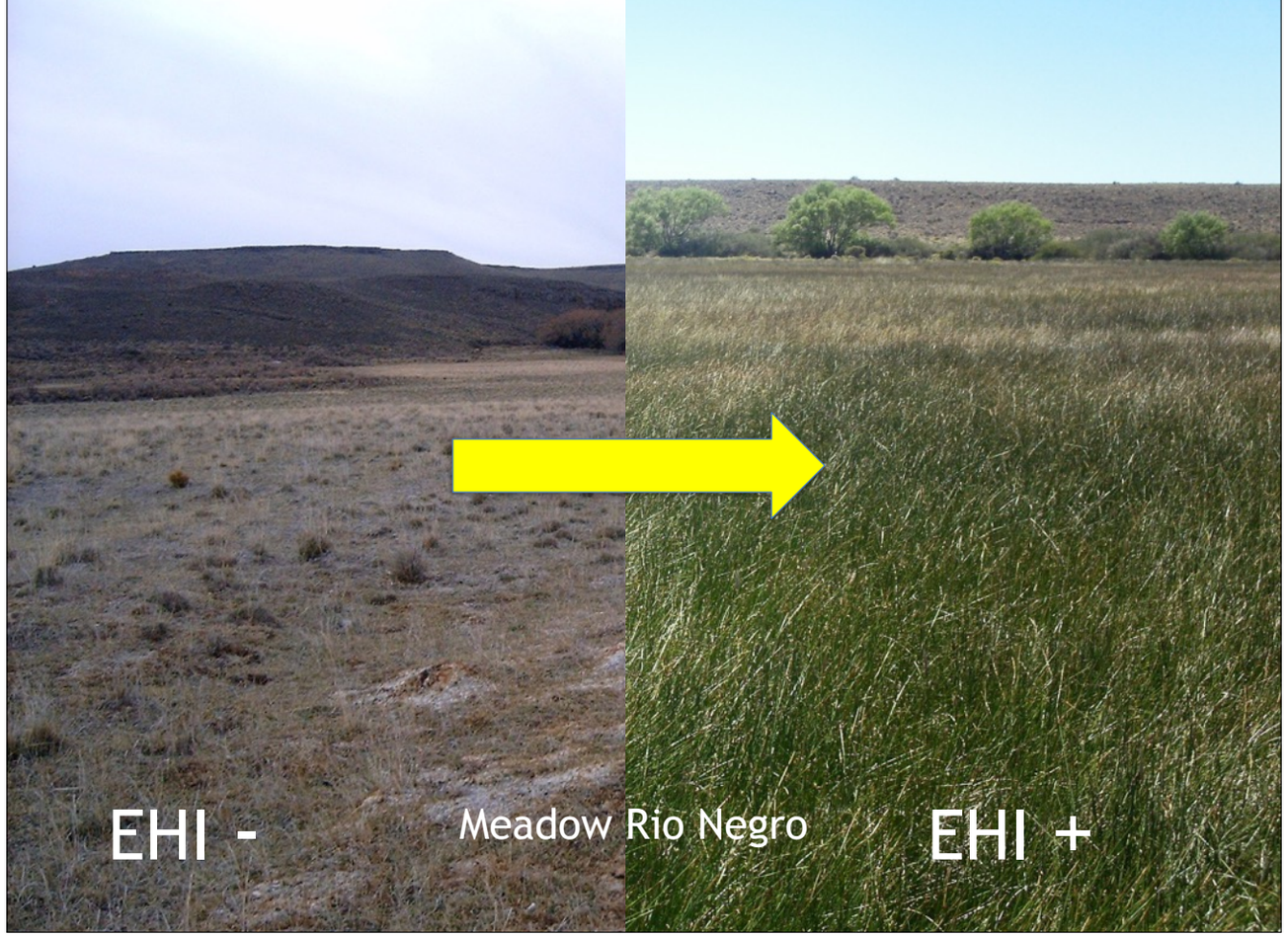
Continuous grazing:
- regrowth
- biodiversity
- soil organic carbon

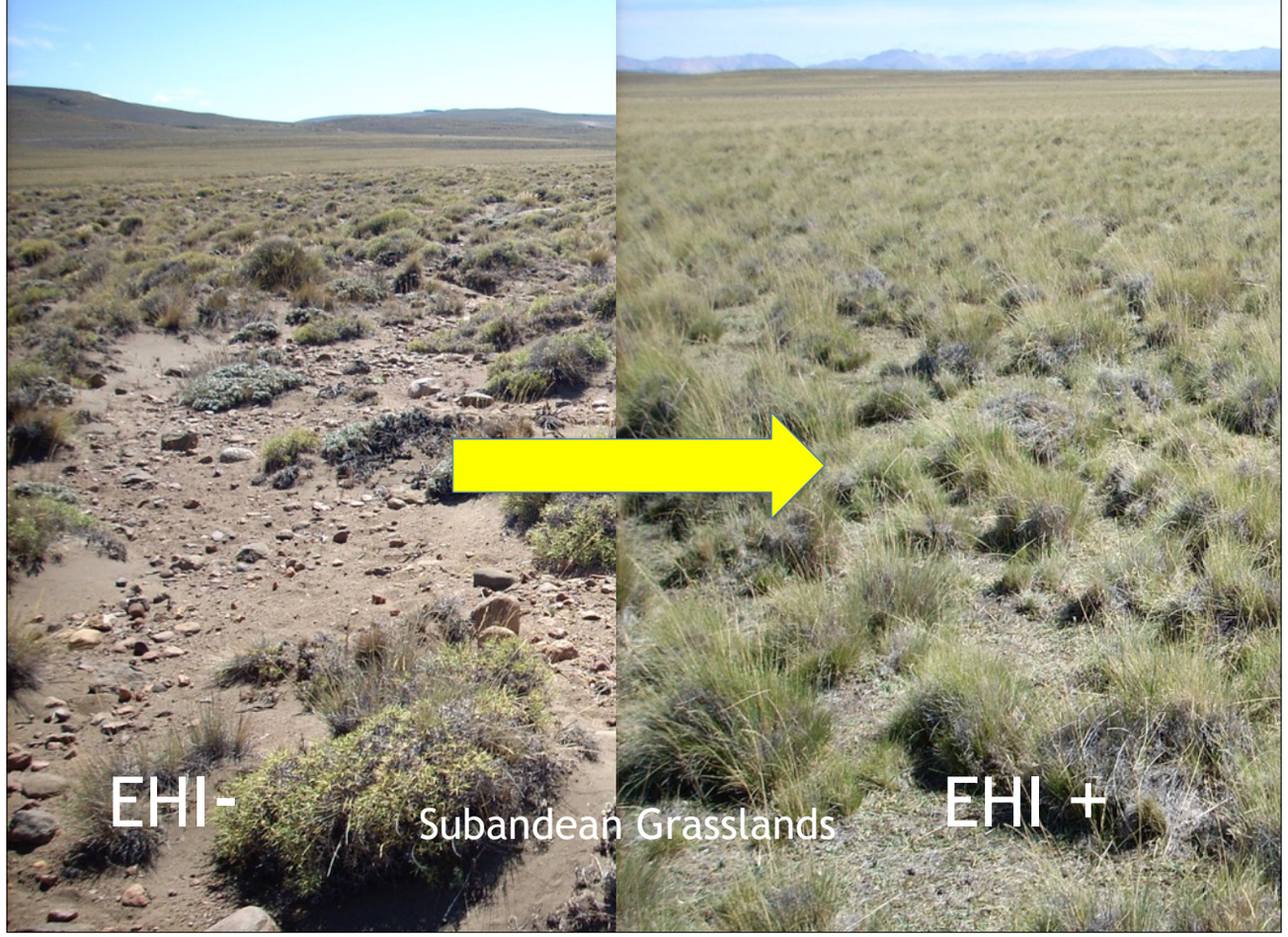
Shift grazing + rest:
+ regrowth
+ biodiversity
+ soil organic carbon

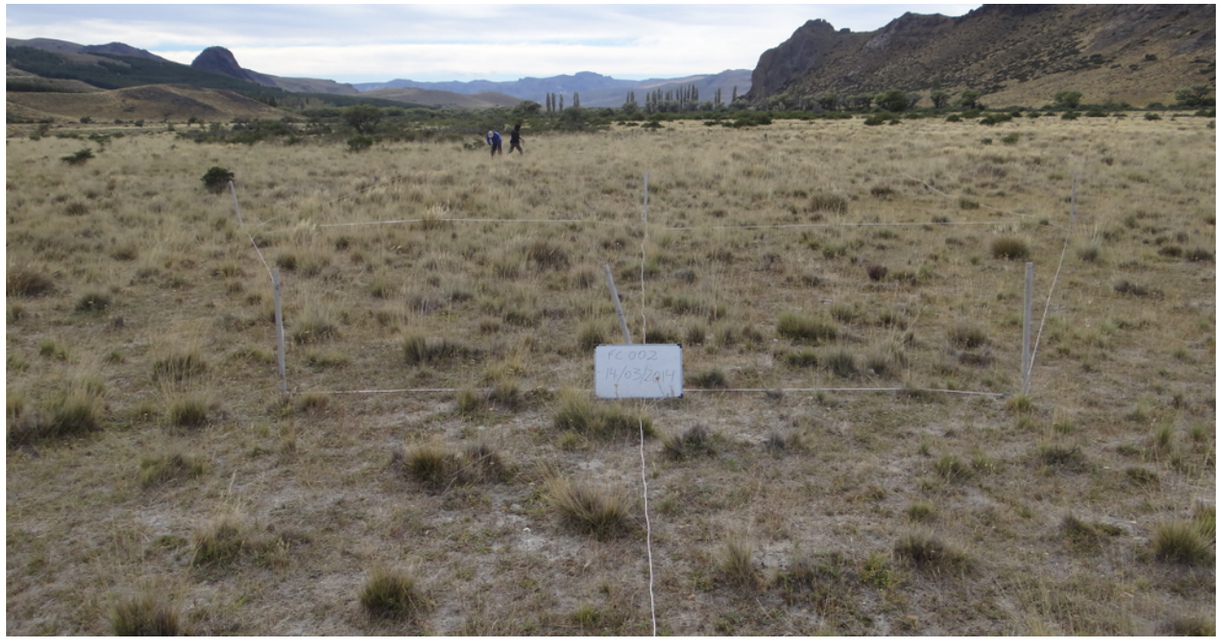
The reference area will have the best possible score for the ecological indicators.



For each ecoregion and relevant types of vegetation, reference areas are chosen as a guide for management.


EHI -
Meadow Rio Negro
EHI +


EHI-
Subandean Grasslands
EHI +

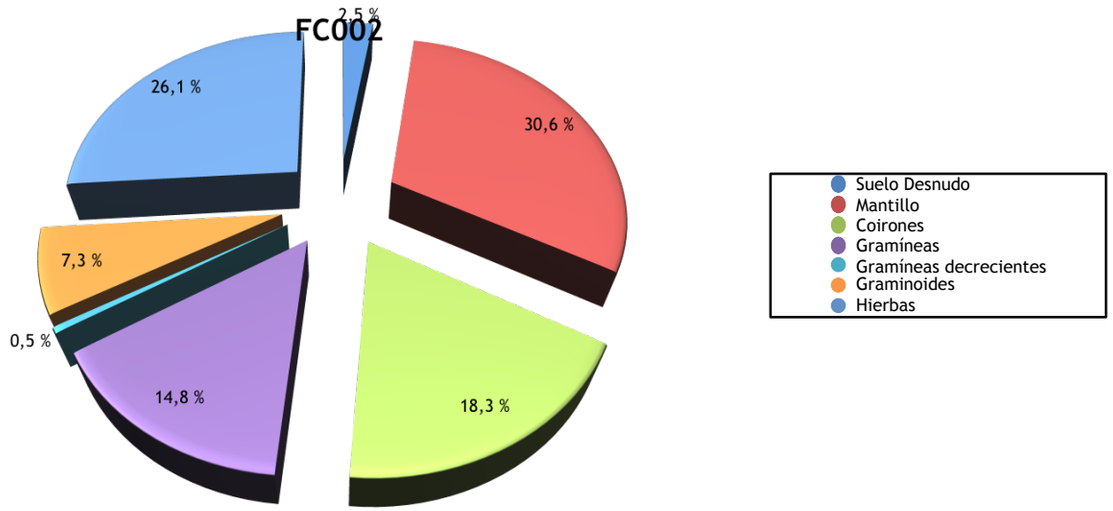


Long term monitoring

Performed by trained professionals

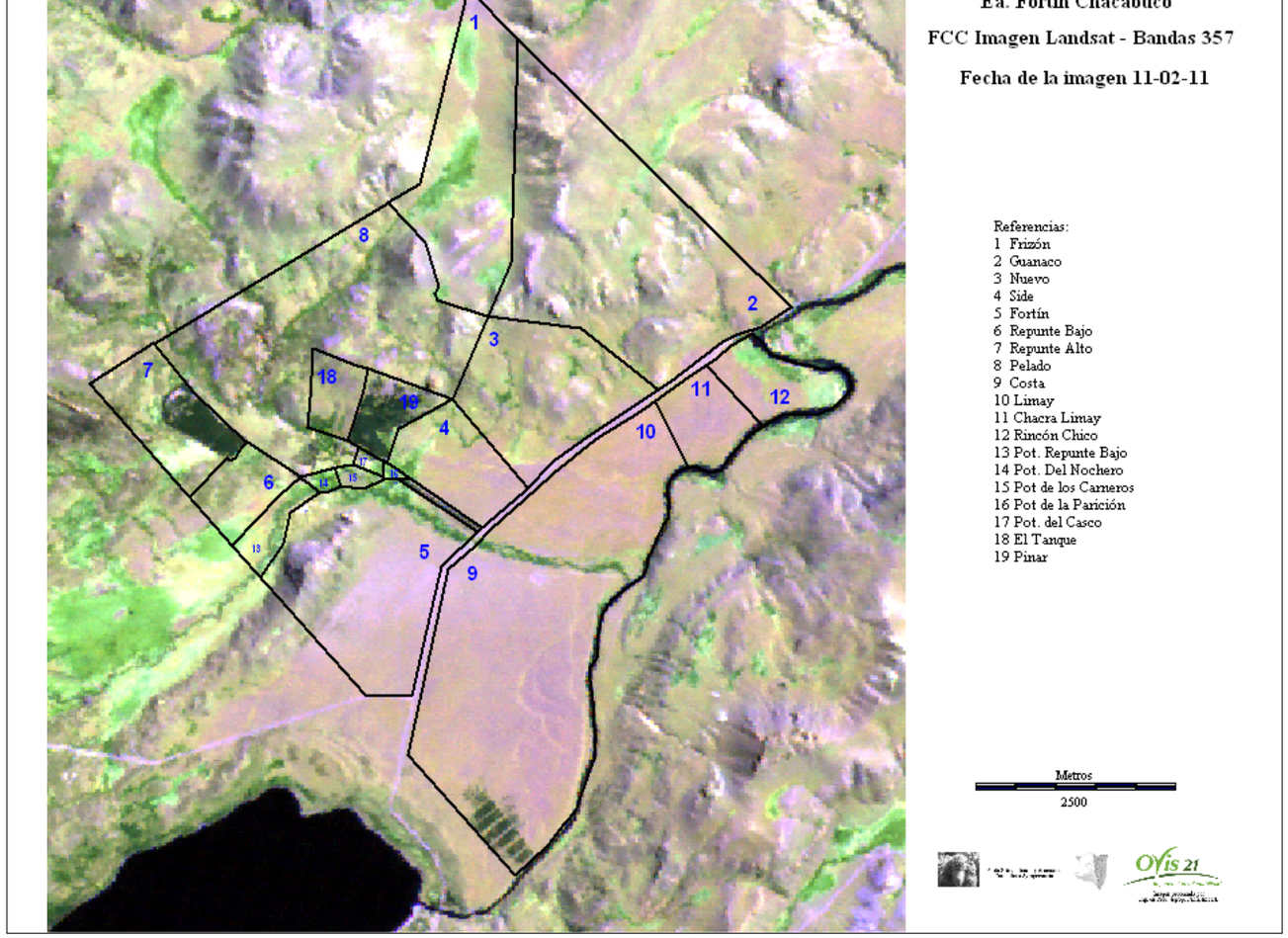
Long term monitoring plots are established that especially focus on plant biodiversity and soil conditions.

Plant biodiversity



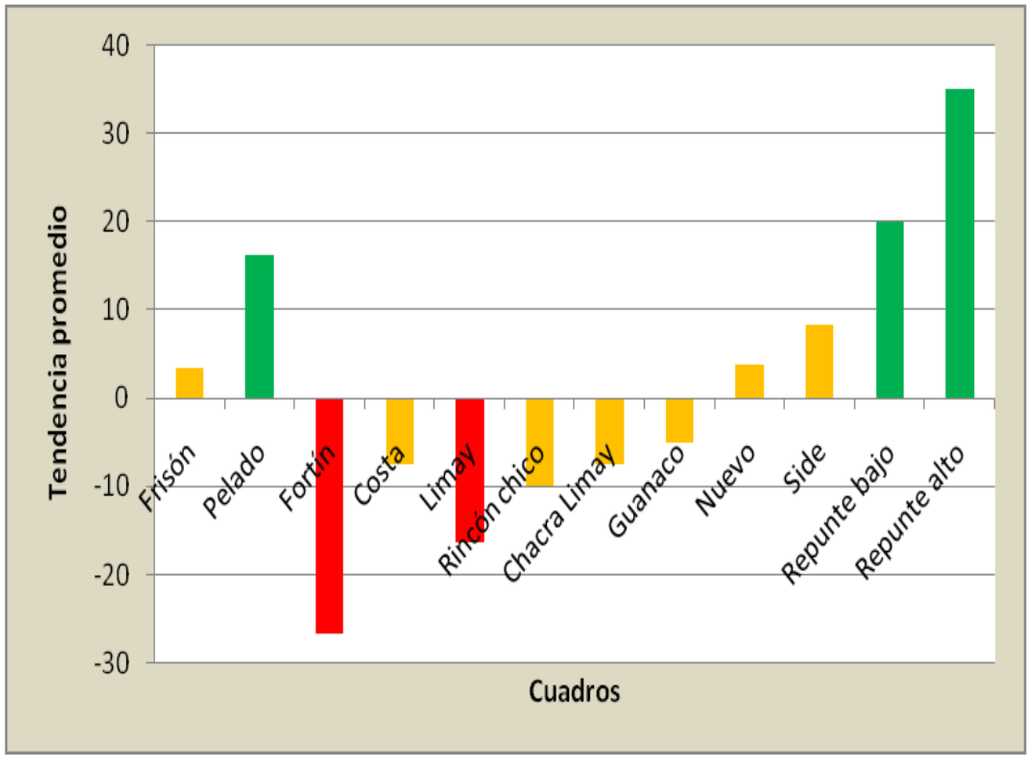
22 especies
Shannon-Weaver Index = 1,95

Soil Monitoring

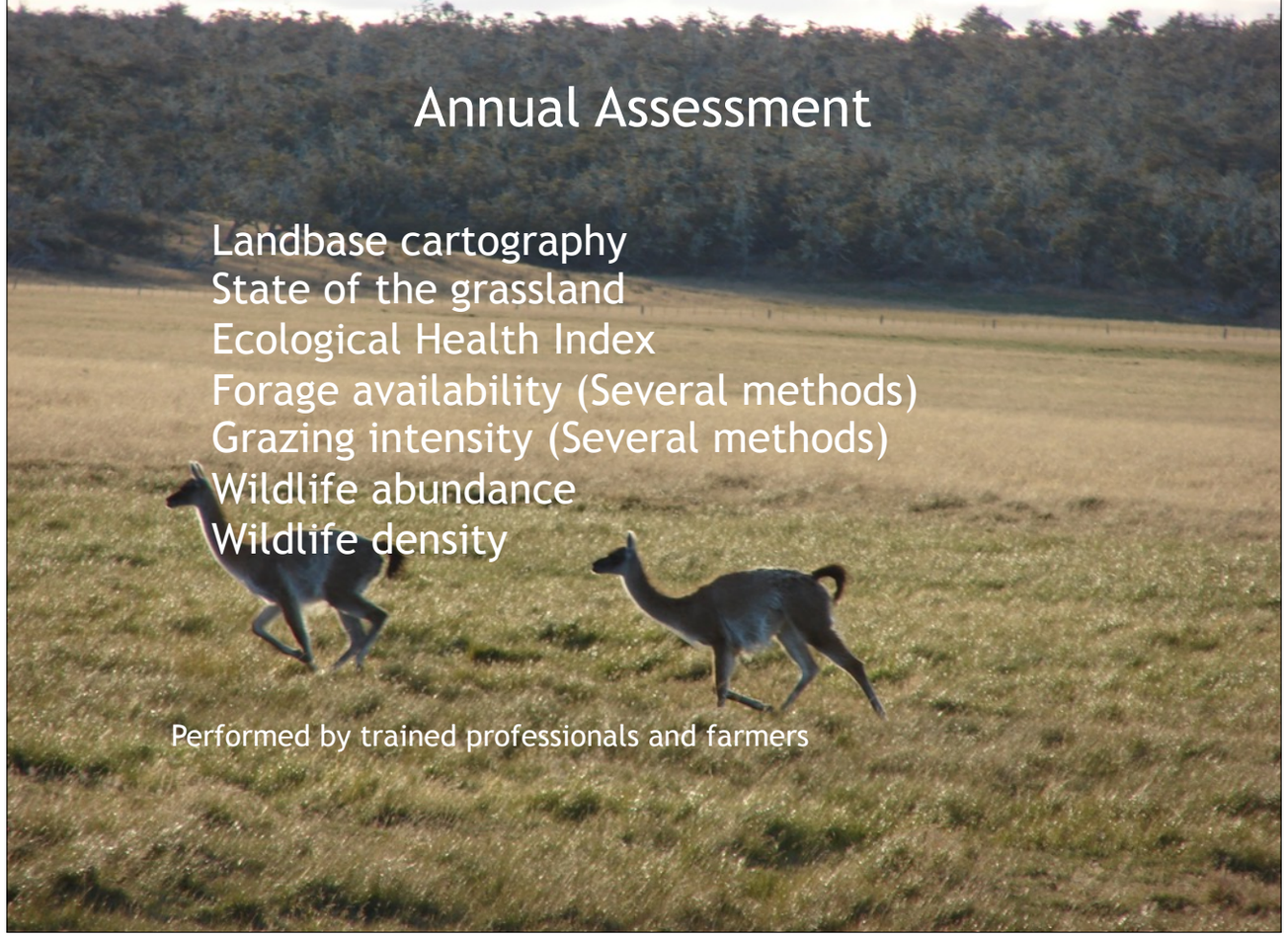


It is done in every grazing divisions.

Ecological Health Index by grazing division



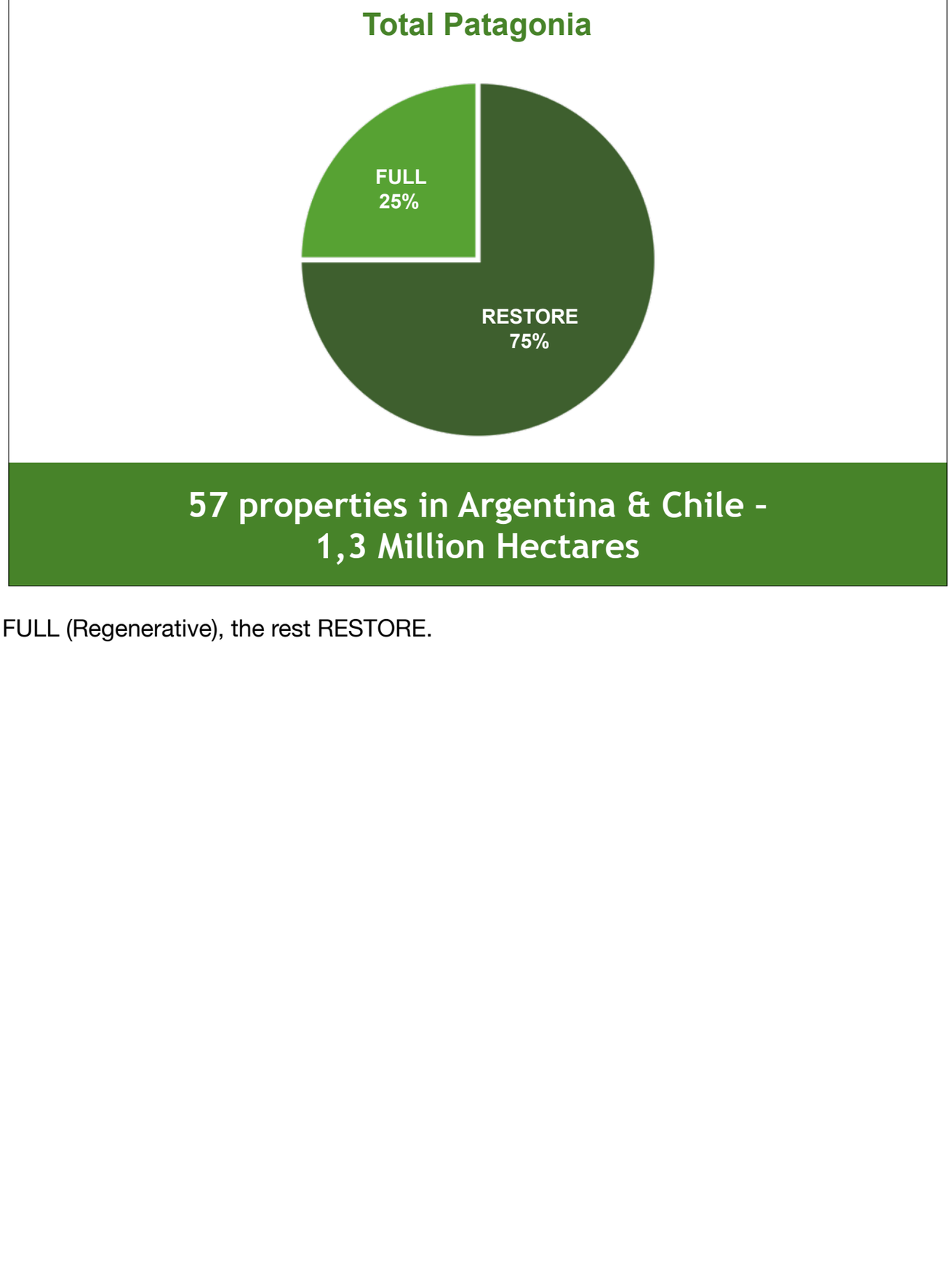
Scores might come out like this.



In between every long term monitoring, the farm do annual assessments.

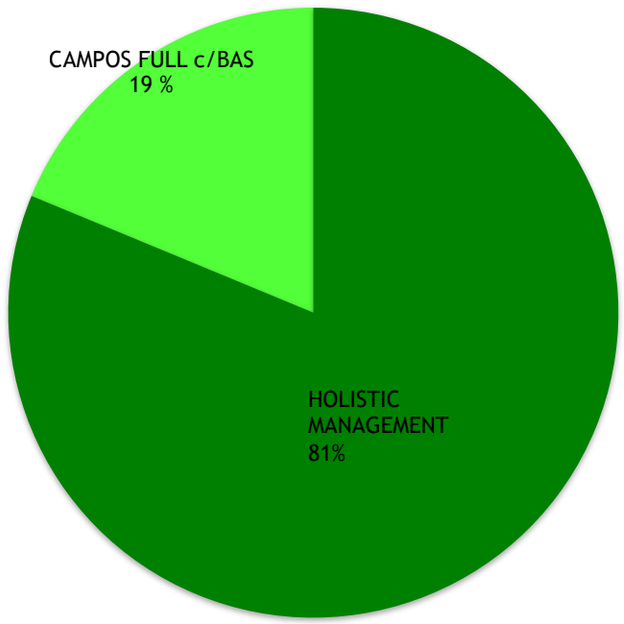
Annual assessment and long term monitoring is used for the grazing planning.

GRASS 2013/14



Some results: In 2014 only 25% scored FULL (Regenerative), the rest RESTORE.

What are the FULL Farms doing?

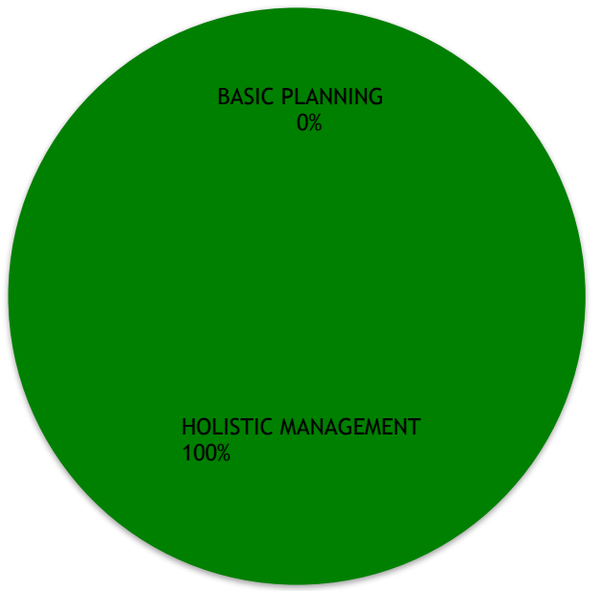


16 Farms
0,7 Million Acres

We could not find a FULL Class farm using stocking rate adjustments out of 41 farms in brittle environments.

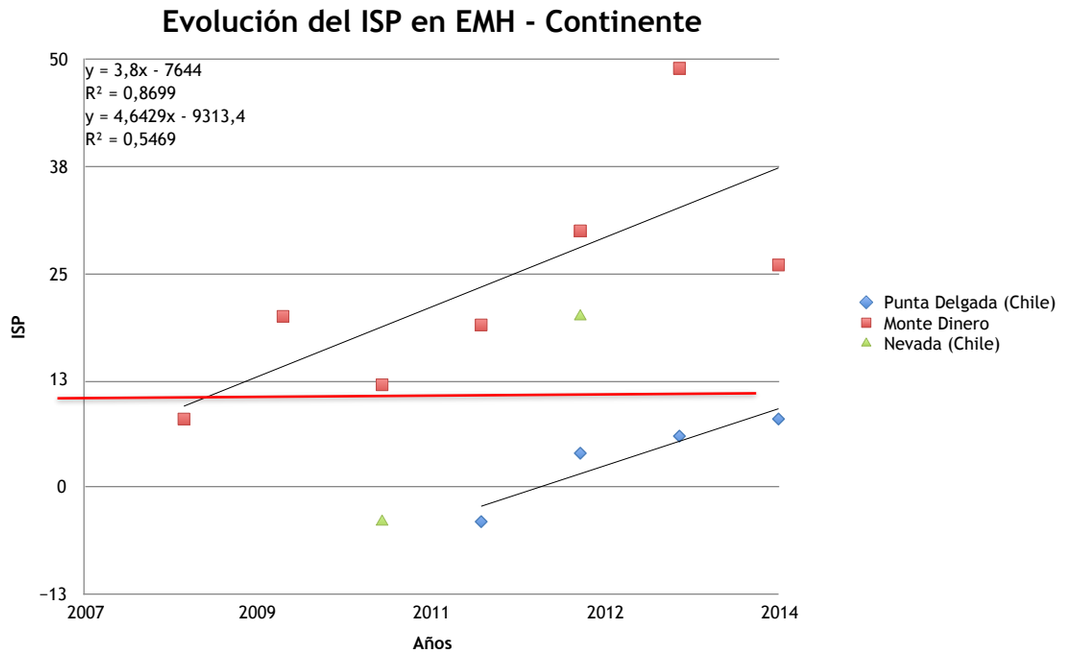
Of those scoring FULL, 81% practiced Holistic Management.

Seven farms changed from RESTORE to FULL in the last 3 years

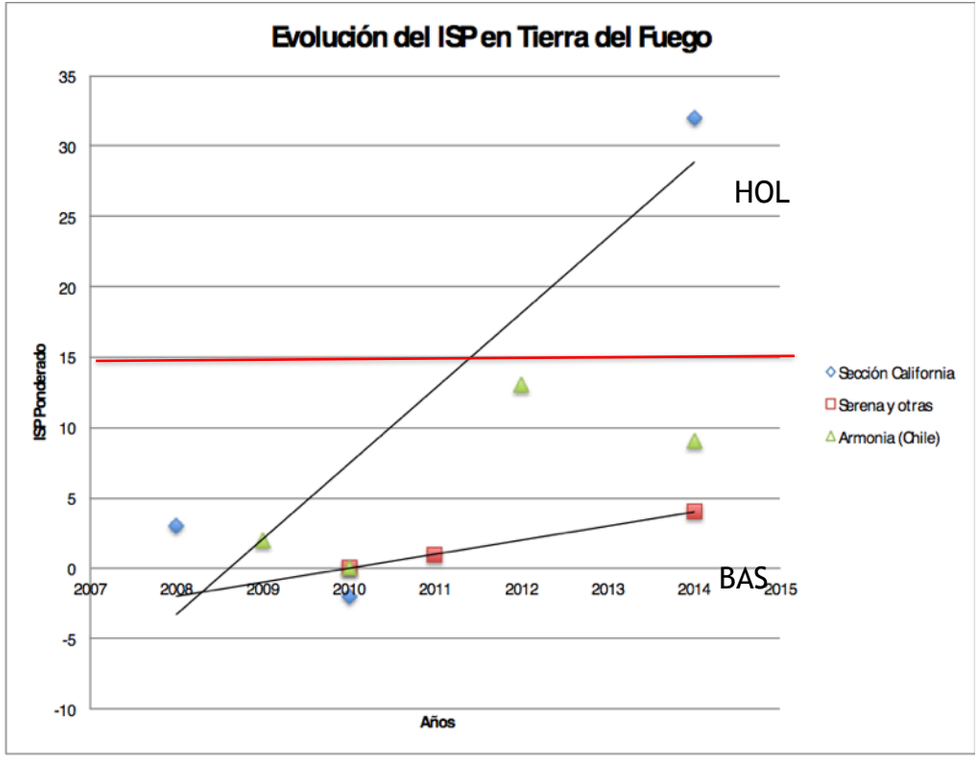


326.000 acres

Of seven farms that progressed from RESTORE to FULL in the last 3 yrs, 100% was practicing Holistic Management.



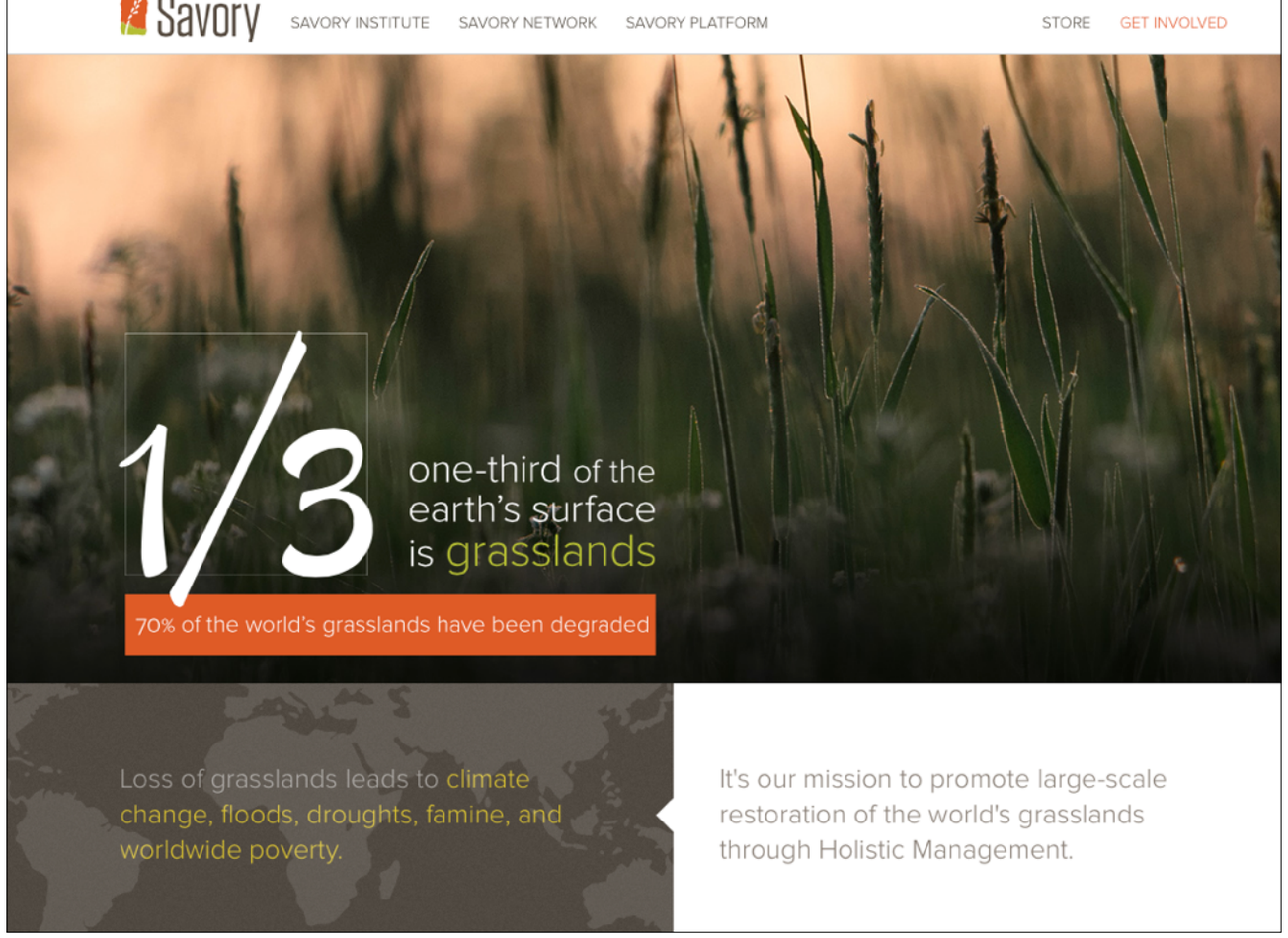
Here is the trend for 3 farms on the mainland. (ISP is Spanish for EHI)



And here we see 3 farms at Tierra del Fuego, split in HM and «basic planning».

The measured results from Patagonia seem to confirm what have been reported for a long time: Proactive adaptive management, such as Holistic Management with time controlled shift grazing (Holistic Planned Grazing), are effective for regenerating the land while at the same time achieving viable livestock rearing and sustainable wool and meat production.

As the southern part of Patagonia in many ways resembles the Atlantic region of Northern Europe, these practices and results could be of high relevance for Nordic grazing. The example from the very south of Patagonia proved this to be effective also under cool and humid conditions, like in the Nordic region of Europe.
Such practices could be valuable for the management of biodiversity and protected areas, and like in Patagonia, could be fully integrated with systems for outcome based payments in agriculture.


Savory
SAVORY INSTITUTE
SAVORY NETWORK
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STORE
GET INVOLVED
1/3
one-third of the earth's surface is grasslands
70% of the world's grasslands have been degraded
Loss of grasslands leads to climate change, floods, droughts, famine, and worldwide poverty.
It's our mission to promote large-scale restoration of the world's grasslands through Holistic Management.

Thank you!