

# Highly bio-diverse grassland assessment on farms

“(2) which grassland qualifies as highly biodiverse  
grassland”?

Biodiversity situation on farm level: An Study of  
the situation at San Antonio & Tortugas creeks

Buenos Aires, October 17<sup>th</sup> 2013

# Objectives

1. Review of the points raised in the proposal for a regulation of the Commission of the European Union for grasslands.
2. Follow-up of case studies in the basin of the San Antonio - Tortugas Creek
3. Use of the check list “Assessment guidelines for determination of bio diverse grassland areas”



1. Review of the points raised in the proposal for a regulation of the Commission of the European Union for grasslands.

# Introduction

## Grassland:

- A kind of natural vegetation,
- One of the most massive vegetative systems,
- More than 39 Millions of km<sup>2</sup> at the world (Costanza, 1997),
- Terrestrial ecosystem dominated by herbaceous vegetation (mainly Graminae – Poaceae) with presence or not of shrubs and/or trees

# Draft regulation highly bio-diverse grassland



EUROPEAN COMMISSION

Brussels, **XXX**  
[...](2012) **XXX** draft

**COMMISSION REGULATION (EU) No .../..**

**of **XXX****

**on defining the criteria and geographic ranges of highly biodiverse grassland for the purposes of Article 7b(3)(c) of Directive 93/70/EC of the European Parliament and the Council and Article 17(3)(c) of Directive 2009/28/EC of the European Parliament and the Council**

# Draft regulation highly bio-diverse grassland: main concerns

- (1) Directives 98/70/EC and 2009/28/EC lay down that biofuels and bioliquids ....., unless in the case of non-natural highly biodiverse grasslands evidence is provided that the harvesting of the raw material is necessary to preserve its grassland status.” No harvesting is done today in this kind of grassland. Also applies for Article 2
- (2) “which grassland qualifies as highly biodiverse grassland..” main objective of the propossal
- (3) “*inter alia* bottomlands, heaths, (upland) pastures, ..., savannahs, steppes,...and prairies” Pampa is included in this list.

# Draft regulation highly bio-diverse grassland: main concerns

- (4) “Directives 98/70/EC and 2009/28/EC distinguish between .....It is appropriate, for the purpose of this decision, to consider **degraded** grassland as **being impoverished** in terms of biodiversity and erosion rather than productive capacity or pollution.”

Degraded or impoverished related to? There are no models to compare with.

- Amount of species present?
- % of ground coverage?
- Amount of plants/ m<sup>2</sup>?
- Human intervention?
- Local parameters?
- Presence of birds and/or small mammals?

## Draft regulation highly bio-diverse grassland: main concerns

- (5) “Comprehensive geographic ranges ..... only for those highly biodiverse grasslands for which these geographic ranges are already available. “

No geographic ranges are provided by the  
propossal.

Geographic ranges are available for the “Pampa” in  
several works.



# Draft regulation highly bio-diverse grassland: main concerns

From Article 1;

- (1) “grassland” means terrestrial ecosystems dominated by herbaceous or shrub vegetation for at least five years. Five years can be a short period of time in temperate areas due time needed.
  
- (3) “natural highly biodiverse grassland” means grassland that:
  - (b) maintains the natural species composition and ecological characteristics and processes. Original Natural species composition in several areas is unknown (Parodi, Dimitri, Colombo). Presence of grazing animals?
  
- (4) “Non-natural highly biodiverse grassland” means grassland that:
  - (a) would cease to be grassland in the absence of human intervention; and This is not completely true
  - (b) is not degraded, that is to say it is not overgrazed or characterized by long-term loss of biodiversity due to mechanical damage to the vegetation or soil erosion; and ... Degraded related to???

# Draft regulation highly bio-diverse grassland: main concerns

*Article 2:* no raw material are harvested.

*Article 3:* independent expert assessment.

- Main issue: original / natural species composition.
- External expert assessment is needed. Information is not easily available. Qualifications?

*Article 4:* applies at the EU. Outside the EU?

# Different Grasslands around the world

- “Prairies” North America
- “Pusztas” East Europe
- “Grassvelds” South Africa
- Mongolians prairies
- New Zealand prairies
- “Sabanas” Africa
- “Llanos” Orinoco river
- “Cerrados” Central Brazil
- “Pampas” Argentina, South Brazil, Uruguay

# The “Pampas”

Pampas:

- ✓ As per Soriano et al: 760.000 km<sup>2</sup>,
- ✓ Main complex of temperate grasslands,
  
- ✓ Seven units:
  - A. Rolling Pampa “Pampa Ondulada”
  - B. Inland Pampa “Pampa Interior”
  - C. Southern Pampa “Pampa Austral”
  - D. Flooding Pampa “Pampa Deprimida”
  - E. Mesopotamic Pampa “Pampa Mesopotámica”
  - F. Southern Campos “Campos del Sur”
  - G. Northern Campos “Campos del Norte”

# Pampa Grasslands



FIG. 1. Mapa de los pastizales del Río de la Plata adaptado de Soriano (1992), donde se indican las subregiones: A) pampa ondulada, B) pampa interior, C) pampa austral, D) pampa deprimida, E) pampa mesopotámica, F) campos del sur y G) campos del norte.

## 2. Follow-up of case studies in the basin of the San Antonio - Turtle Creek



# Brief Description

“Tortugas” Creek fluvial valley, is a local stream that forms the boundary between the provinces of Santa Fe and Cordoba.

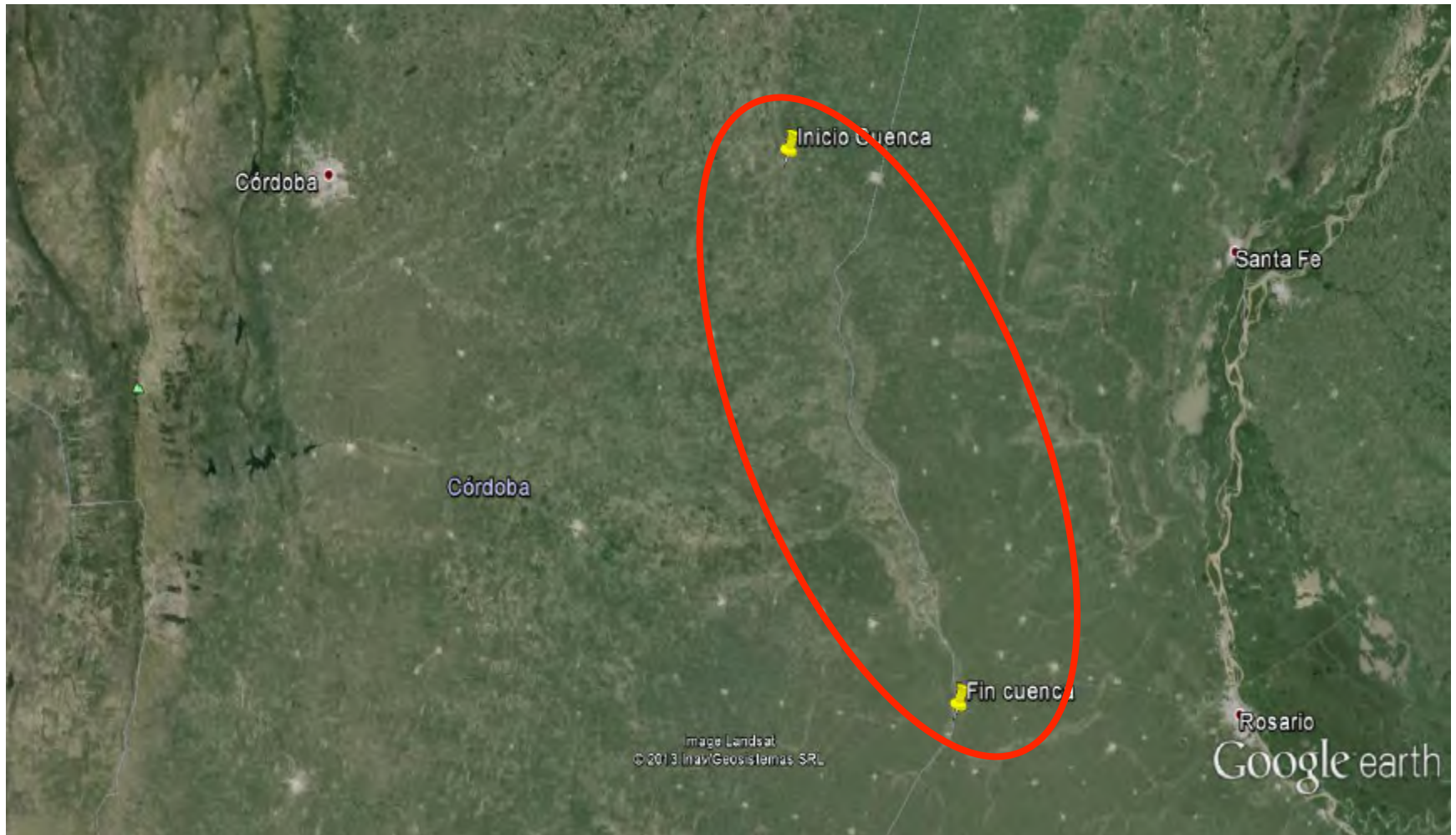
It was developed during the Pleistocene as a paleo River and is a tributary of Carcarañá river.

Basement is covered by about 30 feet of loess, with the current of the stream valley superimposed on that deposit.

Lateral limits of the valley are well defined. On both sides tributary streams have been developed up to 4 kilometers long.

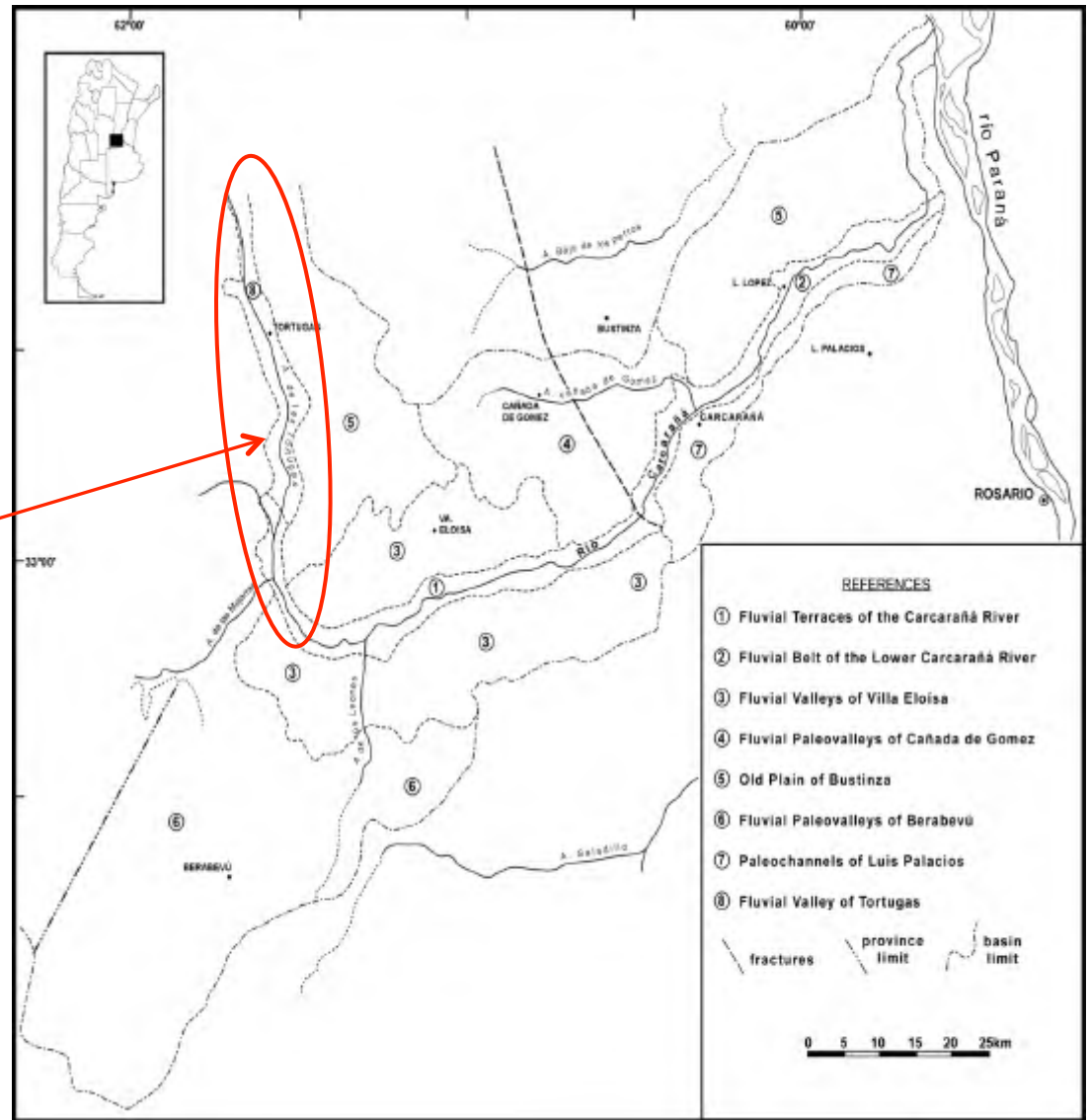
Due to the influence of the Mar Chiquita Lake, water becomes sodium sulfated. The bicarbonate anion is gaining importance downstream, suggesting significant contributions.

# Spatial / Geographical situation





Tortugas' Fluvial Valley



# Description

The under study area is located in the boundary between Santa Fe and Córdoba Provinces:

- North limit: San Francisco City
- South limit: Carcarañá river
- Total length: + 185 km
- Maximum width: 35 km
- Area: about 5,500 Sq km = 550,000 hectares
- Loess and clay soils
- Temperate – humid weather
- No relief barriers

# San Antonio - Tortugas creek flora

The original vegetation in this area was a moderate grassland that was dominated by “flechillar” (*Stipa* spp) [a highly palatable and edible feed for original grazers, mainly Pampas deer's].

The dominant grasses were *Stipa*, *Paspalum*, *Bromus*, *Eragrostis* and *Poa*, with presence of *Vicia*, *Oxalis* and *Adesmia* (Parodi)

Main severe threats in the region:

- conversion of remaining natural habitats for agriculture
- degradation through over-grazing

# Weather: temperatures and rainfall

<u>Temperature.</u>	°C
Minimum - Average	7,0
Maximum - Average	21,0
Minimum	- 6.7
Maximum	36,4
<u>Rainfall</u>	mm
Monthly Average	55
Total	800
<u>Days without freeze</u>	256

As per INTA Marcos Juarez  
climatology station (1961 – 2010)

# Yields at neighboring areas

Production of some selected grains in the nearby area of Tortugas Creek (2011-2012 as per [www.minagri.gob.ar](http://www.minagri.gob.ar))

Marcos Juárez: 9,490 sq km

Belgrano: 2,386 sq km

San Martín: 4,860 sq km

	<i>Production in MT</i>			
	<i>Marcos Juárez Department</i>	<i>Belgrano Department</i>	<i>San Martín Department</i>	
<i>Soybeans</i>	2183443	574290	966800	3724533
<i>Corn</i>	829990	459910	607870	1897770
<i>Sorghum</i>	35100	52000	102300	189400
<i>Wheat</i>	224200	46020	154160	424380

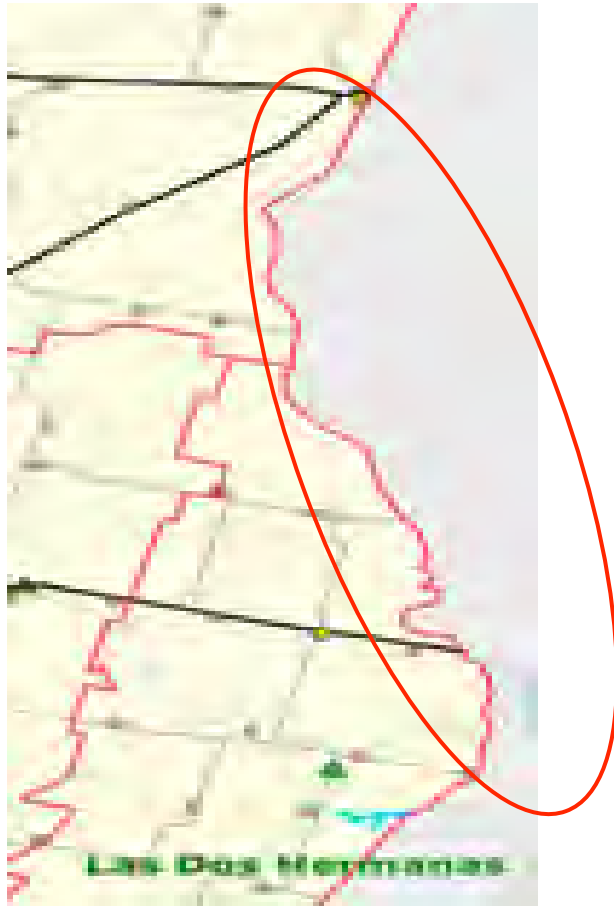
# In between Villa Maria and Rosario



# Nearby cities and towns



# Nearest recognized protected areas (as per SIFAP)





The proposal to the European Commission raises a number of definitions regarding which we consider a "pasture" and its interpretation for the "biomes" present in the Pampas.

Pampa "biomes" have a clear dominance of herbaceous vegetation with the presence (or not) of some shrubs and trees.

Overall grasslands located in the so-called "Rolling Pampa" units where is located the area this study was conducted, are shaped more by the "abandonment" by men that have persisted over time, longer than the "five years" period mentioned in the definition of "grassland".

# Grasses Identified

- *Distichlis* spp
- *Spartina* spp
- *Spergularia* spp
- *Salicornia*
- *Agropyron* spp
- *Festucca* spp
- *Melilotus*
- *Panicum* spp
- *Paspalum* spp
- *Digitaria*



# Some concepts

- “Grassland is not a Pasture” (“Un pastizal no es una pastura” - M. Carámbula) A differentiation must be done between these two concepts.
- Main difference: “human intervention and management”
- There are only anthropogenic reasons why natural bio diverse composition criteria may not be fulfilled, and, in consequence, natural grassland that is not highly bio diverse must be recognized as non-natural grassland.
- Long processes, more than 300 years.

# Some concepts

- Natural and naturalized species.
- Endemic species.
- Recent invasion of adventitious species, incorporated by cattle movements from the North of Argentina.
- An opposition between the concepts of "biological decay" and "oxidation" of organic matter.
- Ground cover
- Moisture maintenance / conservation

# Some concepts

Factors limiting the expansion of agriculture in the area (with actual genetic materials) “abandonment”:

- Soils Limitations (presence of salts)
- Underground water level close to surface
- Lack of interest in livestock production
- Economic limitations generated by insecurity (cattle rustling)

Plus:

- Average size of farms: about 200 has.

# San Antonio - Tortugas creek



# San Antonio & Tortugas creeks



# San Antonio - Tortugas creek



Cortadeira spp



Opuntia spp



# San Antonio & Tortugas creeks



# San Antonio - Tortugas creek



# San Antonio - Tortugas creek



*Eryngium horridum* –  
“falso caraguata”



# San Antonio - Tortugas creek



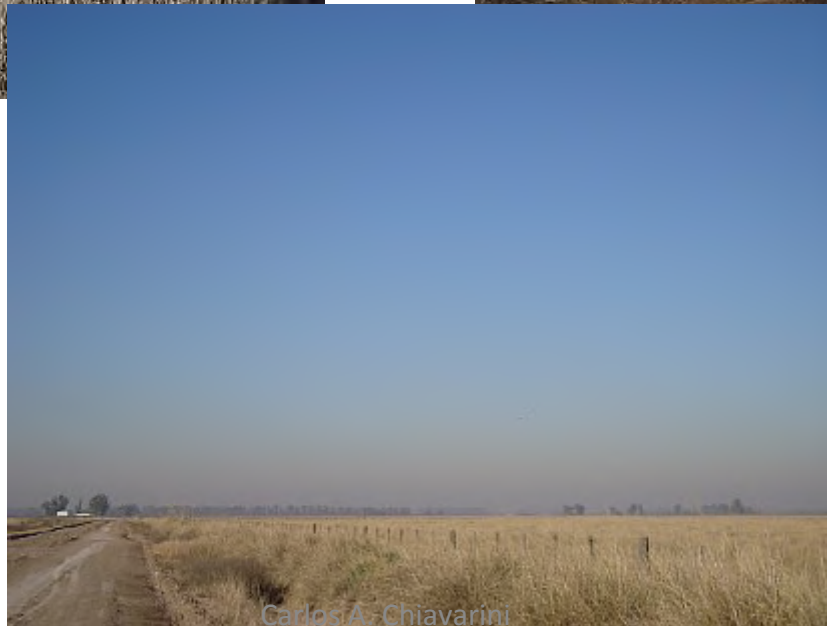
Owls' nest



# San Antonio - Tortugas creek



# San Antonio - Tortugas creek



# San Antonio - Tortugas creek



# San Antonio - Tortugas creek



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# San Antonio - Tortugas creek



# San Antonio - Tortugas creek



# San Antonio - Tortugas creek







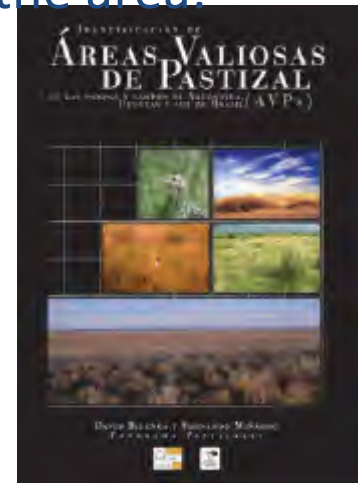


# Birds!

As per the site

<http://avesyareaspotencialesdesantafe.blogspot.com.ar>, and the WWF web site there are 8 birds species threatened in the area:

- tachurí canela (*Polystictus pectoralis*);
- espartillero enano (*Spartonoica maluroides*);
- capuchinos (*Sporophila sp.*);
- Aguilucho alas largas (*Geranoaetus albicaudatus*);
- Batitú (*Bartramia longicauda*);
- Playerito pectoral (*Calidris melanotos*);
- Playero zancudo (*Calidris himantopus*)



Though, during our visit we could see individuals of “teros” (*Vanelus chilensis*), “aguiluchos” (*Buteo sp.*), “lechuzas” (*Strigidae*), “torcazas” (*Zenaida*) and “chimangos” (*Milvago*), quite the same birds you can see in neighboring agriculture plots.





# Animals

The fauna in this eco region includes:

- Venado de las pampas (*Ozotoceros bezoarticus*),
- Zorro pampeano (*Dusicyon gymnocercus*)
- Zorrino (*Conepatus chinga*)
- Cuis grande (*Cavia aperea*)
- Nutria Coipó (*Myocastur coypus*)
- Peludo / bicho mulita (*Dasypus hybridus*)

And cattle....





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# Summary

- While other steppe grasslands are “natural” and have retained their floristic composition for millennia, local grasslands have not retained this.
- Biodiversity depended on large herbivores (domestic livestock) grazing that has replaced the original wild herbivores since hundred of years ago.
- Extensively managed livestock can play a similar ecological role in shaping and maintaining grasslands as domestic livestock have completely replaced wild grazers. See “Savory Institute” works in Africa.
- Pampas deer (*Ozotoceros bezoarticus*) was the main herbivore; nowadays less than 2000 individuals remain (Demaria et al)
- Natural vegetation grows in small patches that persist along the railroad tracks and in some abandoned fields left to rest for many years. Only certain species of animals live in this disturbed and altered habitat.

# “Campos Naturales”

Grasslands are a complex mixture resulting from the adjustments of several “selection pressures” forces:

- Varying Temperatures
- Varying Rainfall
- Fire
- Grazing and management techniques
- Cattle Trampling (“pisoteo”)
- Floods
- Agriculturization attempts
- Abandonment

# What to think about....

- Commodities' super cycle (Heap, Castro)
- Economic reasons for cattle and agricultural expansion.
- Major limits of agricultural expansion:
  - a. Soil problems (same has happened at Brazilian Cerrado)
  - b. No resistant genetic material (but salinity resistance genes exist in species such as triticale - *Triticocereale*)

# What to think about....

- 2050 = 9,6 billions inhabitants?
- Hunger & Malnutrition?
- Climate change
- Commodity speculation
- Environmental degradation
- Changing consumer habits

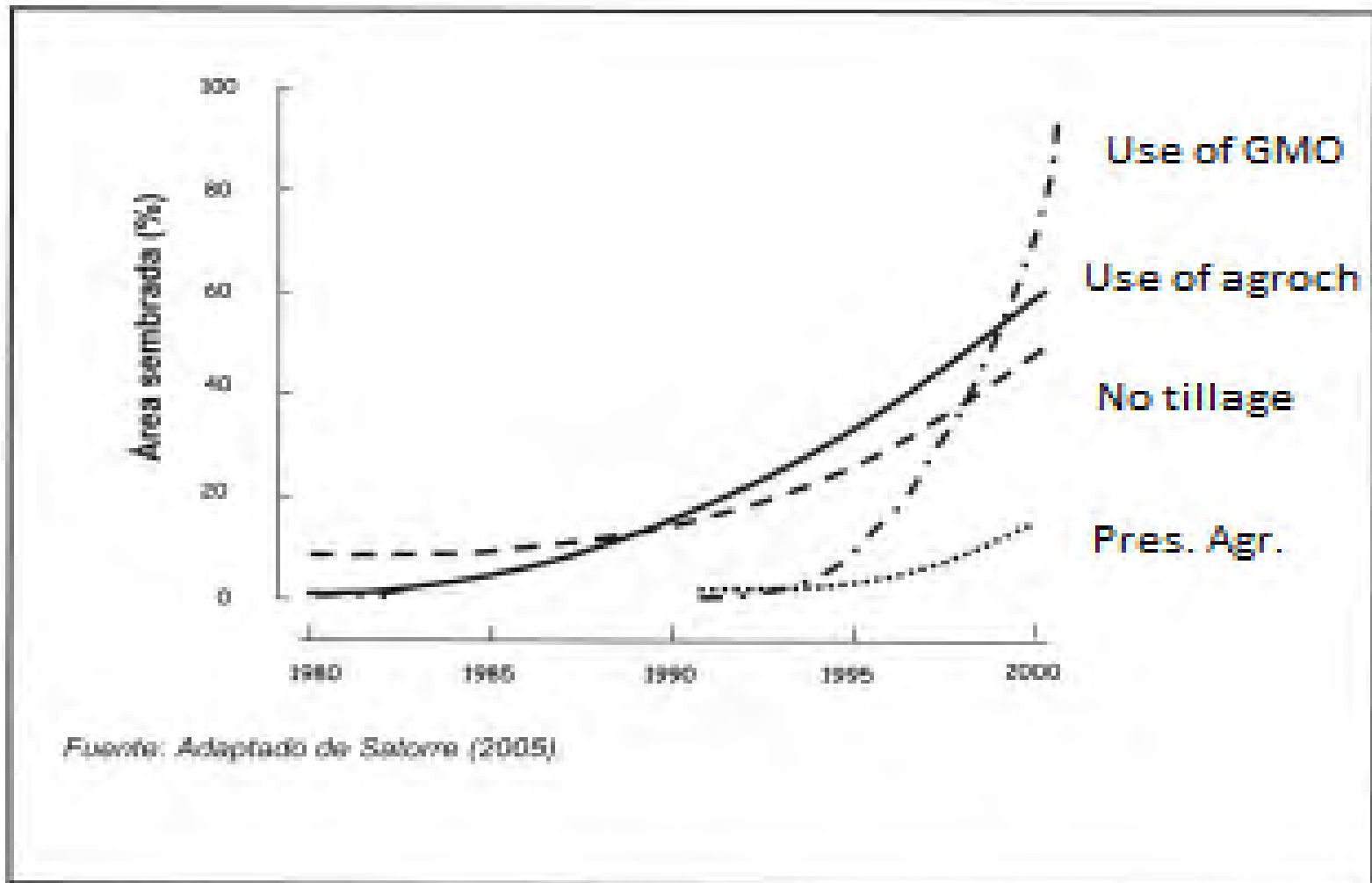
“There is hope” – Sir Gordon Conway

# Agriculture expansion in Argentina

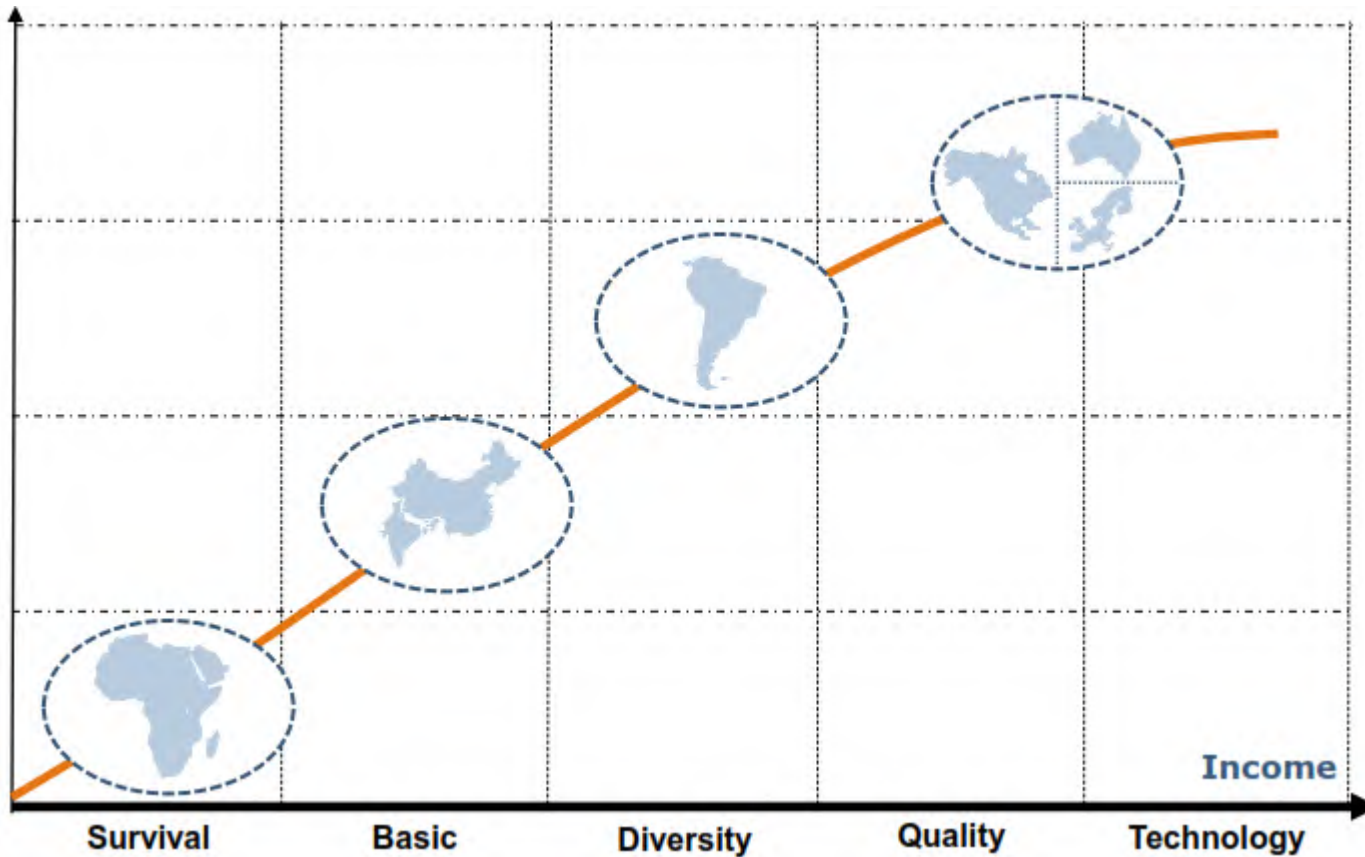




# Use of technologies: Argentina, Soybean Production 1980-2000 (de Viglizzo y Martinez Ortiz)



# Food habit changes



# Must these areas remain as grasslands?

We can be concerned about the loss of biodiversity in this environment.

Modern biotechnology has dramatically increased knowledge of genes' expressions. Biotechnology (conventional or transgenic) has increased crop productivity (by disease resistance, herbicide resistance, drought tolerance, etc)

Researchers are working to find salinity resistance from other species and transfer them to important crops.

Not only “Mankind questions must be done. Farming activities are facing big pressures to increase their revenues, mainly due high taxes and Cost of opportunity related issues. Tax structure is nowadays heavy and complicated and it is getting worse.

### 3. Use of the check list “Assessment guidelines for determination of bio diverse grassland areas”



#### ISCC Procedures for Farm/ Plantation – Assessment guidelines for determination of biodiverse grassland areas

Checklist for the assessment of biodiverse grassland	
1	Farm operator name
2	Farm location and address (including country), geocoordinates
3	Total ha size of concerned grassland area and of total existing crop land
4	Independent experts assessment?      yes: <input type="checkbox"/> no: <input type="checkbox"/>
4.1	Independents experts name and title:
4.2	Expertise of independent expert

#### General guidelines:

This procedure has to be used prior to a potential conversion of grassland. A farmer/plantation manager intending to convert a grassland area and the independent expert, which must be consulted in certain cases, must use this procedure. The results of the assessment must be included in the “Findings” of this document and based on that Findings, a decision if a conversion could be done without violating ISCC Principle 1 can be met. In case of an ISCC sample audit of the farm/plantation after the conversion date of the respective grassland, this procedure together with relevant evidence documents must be provided to the ISCC auditor. The ISCC auditor should check the statements made in this documents together with the evidence. If he accepts findings and evidence he can confirm by filling the last column “Conformity”. In case of a conversion of a potential grassland area, where not such a procedure can be provided, Principle 1 on biodiverse grassland is violated.

The procedure is split in a section A, where the producer can pre-determine, if an area subject to potential conversion is highly-biodiverse and a section B, which forms the basis for an independent expert assessment. Section B is based on the voluntary guidelines on biodiversity-inclusive impact assessment annexed to Decision VIII/28 adopted by the conference of parties to the Convention on Biological Diversity on 15 June 2006.

The method of this procedures conforms to the Draft European Commission Regulation on defining the criteria and geographic ranges of highly biodiverse grassland for the purposes of Article 7b(3)(c) of Directive 98/70/EC of the European Parliament and the Council and Article 17(3)(c) of Directive 2009/28/EC of the European Parliament and the Council.

# “Assessment guidelines for determination of bio diverse grassland areas”

Farms visited have 175, 200 and 210 hectares. They all have about 75 – 85 % of the area dedicated to agriculture and are located at Montes de Oca district, Belgrano Department, Santa Fe Province.

Farmers do not live in the farm and have other activities. Area not suitable for agriculture is abandoned.

These farms and other in the area were a fraction of a big “estancia” located in this area at the end of XVIII<sup>th</sup> Century. The area was quite completely sown with alfalfa at the beginning of XX<sup>th</sup> Century. At the middle of XX<sup>th</sup> Century, this estancia was divided, and agriculture and dairy replace cattle production, but also remains some alfalfa / fodder producers for the army.

Since the end of the 90’s, farmers move massively to the nearby towns and situation remains as then. Also during that time GMO soybeans was introduced in the area.

# “Assessment guidelines for determination of bio diverse grassland areas”

Main problems found during the pilot visit, from the farmers:

- Language of the check list (English!)
- Time: there are plots without use from more than 5 years.
- Documents to prove maturity of grasslands: unknown.
- Definition of “maturity of grasslands”.
- Lack of knowledge about the access to national and international database about protected areas .
- Species richness in grasses and legumes at actual “campos naturales” (present composition versus agriculture / pasture composition and versus “original” composition)
- Presence or not of protected, endangered or threatened species in the farms or nearby areas.



Thanks!



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Ag. Eng.

