Honeybee forage resources important for pollination services

by

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What’s Next

The development of national targets, and the updating and revision of national biodiversity strategies and action plans (NBSAPs), will be key processes in fulfilling the commitments set out in the Strategic Plan. To support countries in these efforts, the Secretariat, together with global and regional partners and with the generous support of the Government of Japan and other donors, will be convening a series of regional and subregional capacity-building workshops throughout 2011 and 2012. The workshops will build on the success of a first series of Capacity Development Workshops for NBSAPs and Biodiversity Mainstreaming held in 2008 and 2009. For further information on these workshops please see www.cbd.int/nbsap. Additional information on the Strategic Plan can be found on www.cbd.int/sp2020.

Strategic Plan for Biodiversity 2011–2020

“Living in Harmony with Nature”

The Strategic Plan for Biodiversity 2011-2020 – A ten-year framework for action by all countries and stakeholders to save biodiversity and enhance its benefits for people.
**Strategic Goal B:** Reduce the direct pressures on biodiversity and promote sustainable use

- **i.e. Target 7:** ...agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

**Strategic Goal D:** Enhance the benefits to all from biodiversity and ecosystem services.

- **i.e. Target 14:** ...ecosystems that provide essential services... are restored and safeguarded, ...
‘Commercial Pollination is SA’
(Mike Allsopp)

• Use of **rental** colonies for **crop** production
• Crucial for quality & quantity of crop
• Now about >60% of beekeeper income
• **87% of colonies** in the Western Cape used for commercial pollination (some 60 000 units)
• About **80 crops use paid pollination** (vegetable seeds, deciduous fruit, subtropical fruit, melons, berries, oilseed crops, nuts, cucurbits, beans)
• **Value added** to the country (+/- R5 Billion per yr) plus tens of thousands of jobs
Global Pollination Project

Brazil, Ghana, India, Kenya, Nepal, Pakistan, South Africa
GPP Sites in SA

- Payment for managed bees
- Export regulations
- Attractive to pollinators

Biodiversity Hotspot!

- No payment for mgd bees
- Vast landscapes
- Attractive to pollinators

Springbok Flats
- Sunflowers

Little Karoo
- Hybrid onion seed
- Payment for managed bees
- Valuable export crop
- Attractiveness variable

Biodiversity Hotspot!

Boland, Koue Bokkeveld & Langkloof apples
Pollinator counts in hybrid onion seed fields in male (m) and female (f) lines

Majority of hybrid onion seed farmers do not have sufficient access to wild pollinator habitat and use managed bees. Flowering also after spring pollinator peak.

Mariëtte Brand, PhD student (2009 to 2013) - The importance of pollination ecosystem services to hybrid onion seed production in a biodiverse, semi-arid region in South Africa. Supervisors: Dr Ruan Veldtman (SANBI/SUN), Prof Michael J. Samways (SUN) & Dr Jonathan F. Colville (SANBI)
Wild vs. managed pollination services

- There is a bias to emphasize the service provided by native pollinators

**BUT**

- Exotic species can provide pollination ES – e.g. feral honeybees in Australia Cook *et al.* 2007
- Managed exotic species can provide commercial scale pollination – Almonds in USA
- Managed native species can also provide commercial scale pollination and exchange genes with wild populations – managed honeybees in South Africa

**Generally**

- Market needs and the agricultural environment dictate the pollination service that can be used
Indigenous honeybees in South Africa

Apis mellifera scutellata
African (Savanna) honeybee

Apis mellifera capensis
Cape honeybee
Natural System

Direct Ecosystem Service
Habitat for pollinators adjacent to crops.

Wild Pollinators

Crop production reliant on insect pollination

Agricultural System

Managed Pollinators

Man-made Service
Managed beehives hired during flowering period.

Indirect Ecosystem Service
1) Natural vegetation as forage
2) Replenishing colonies

Natural System

Veldtman, Mouton, Colville, Allsopp & Samways *in prep*
Forage use for managed honeybees in Western Cape

Honeybee Forage Project: what is the ECOLOGICAL INFRASTRUCTURE that supports this managed pollination service?
Ecosystem service — disservice = societal benefit

$7,500,000 - $348,148 = $7,151,852 per year

or $20,500,000

de Lange, Veldtman & Allsopp 2013
Valuation of pollinator forage services provided by *Eucalyptus cladocalyx*. *Journal of Environmental Management* 125, 12-18.

Gums represent valuable forage in the landscape
Some conclusions

- Value of pollination services must be divided between wild and managed pollination

- These depend on different natural capital (on-site habitat vs. of-site forage availability), requiring separate policy/management recommendations

- Exotic not necessarily ‘bad’ and indigenous not always ‘best’ in terms of ecosystem service provision/delivery

- Real-life situation: best way to manage a environmental system is to have a patch-work (diversity) of land uses

- How does this translate for planners in terms of ‘ecological infrastructure’ or ‘ecological support areas’?
BPF discussion points

- How to map this real life EI/ESA? (we do not have carrying capacity or local spatial data)

- Is there a set of principles that landuse planners would find useful?

- Is the ‘honeybee forage conundrum’ a representative case study?