



Where's Weedy? Outlining the case for improved weed data aggregation to enhance on-ground outcomes for management

Bruce L. Webber, Kathryn L. Batchelor, John K. Scott & Stephen J. van Leeuwen

CSIRO LAND & WATER | CSIRO HEALTH & BIOSECURITY
Atlas of Living Australia Science Symposium May 2016, Perth, Western Australia

 @DrBruceWebber



Global change & biodiversity

“On a global basis... the two great destroyers of biodiversity are, first, habitat destruction &, second, invasion by exotic species.”

- E.O. Wilson (1999)



The case for improved data aggregation

- Land managers & weed researchers are looking for publically available weed data to detect & prevent new weed incursions

Mapping of invasive alien plants: the contribution of the Southern African Plant Invaders Atlas (SAPIA) to biological weed control

Biol Invasions (2013) 15:847–858
DOI 10.1007/s10530-012-0334-6

ORIGINAL PAPER

A new comprehensive database of alien plant species in Chile based on herbarium records

Nicol Fuentes · Anibal Pauchard · Paulina Sánchez · Jocelyn Esquivel · Alicia Marticorena

Received: 11 October 2011 / Accepted: 30 August 2012 / Published online: 14 December 2012
© Springer Science+Business Media B.V. 2012

Abstract There is an urgent need for comprehensive national databases on alien plant species in developing countries. Despite the fact that biological invasions are considered a major threat to biodiversity, they are not considered a priority for research or not considered a priority for funding. We aim to

LETTER

Global exchange and accumulation of non-native plants

Mark van Kleunen¹, Wayne Dawson¹, Franz Essi¹, John Kartesz², Misako Nishino⁷, Liubov A. Antonova⁸, Juliana Cárdenas-Toro^{2,13}, Nicolás Castaño¹⁴, Eduard Nicol Fuent¹⁵, Quentin J. Groom²⁰, Lesley Hendrickson²¹, Olga Morozova²⁷, Dietmar Moser², Daniel L. Nickel²², Maria Schulze³¹, Hanno Seebens³², Wen-sheng Shiu³³

around the globe, humans have greatly altered the environment with ever-increasing speed. One of the most significant changes in the modern era is the erosion of biological diversity. This is the erosion of species and ecological

Biol Invasions (2016) 18:631–645
DOI 10.1007/s10530-015-1035-8

ORIGINAL PAPER

Identifying hotspots of alien plant naturalisation in Australia: approaches and predictions


Aaron J. Dodd · Michael A. McCarthy · Nigel Ainsworth · Mark A. Burgman

Published online: 14 December 2015
© Springer Science+Business Media B.V. 2015



The case for improved data aggregation

- Assumption: (herbaria) databases are representative **X**
 - lodged collections only, often biased
 - weeds generally under-represented
- NatureMap/FloraBase in WA

IBRA region 	Total species	Weeds (%)	Tot herbarium records	Weed records (%)
Pilbara	2433*	4.9#	32478*	2.5
Chichester	1234	6.1	7916	2.4
Roebourne	1072	7.1	5633	5.6
Fortescue	923	3.6	2953	2.6
Hamersley	1522	4.1	15976	1.6

Data from WA Department of Parks and Wildlife NatureMap; *Data from ALA; #Data from WA Department of Parks and Wildlife Herbarium

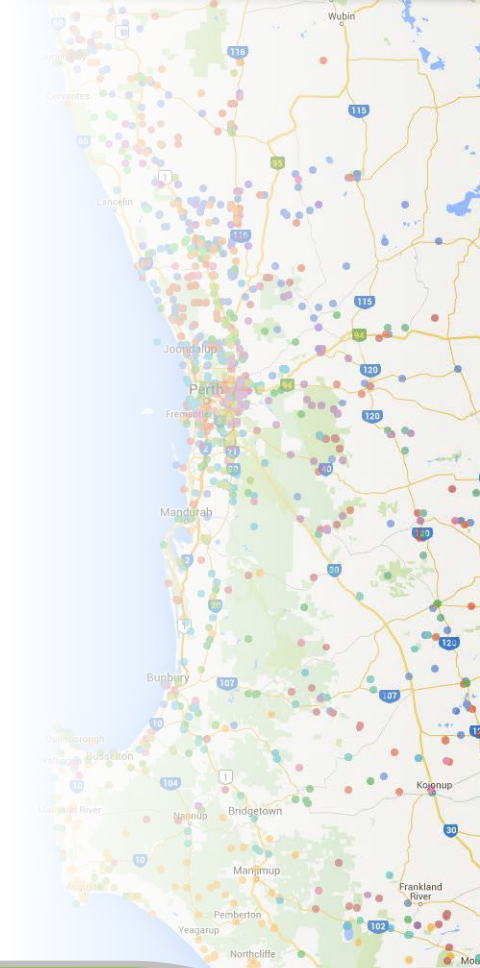
Finding weed data outside herbaria

- Why limit ourselves to specimen-associated data?
 - Quality control
 - Online access
 - Other metrics missing (absence, abundance)
- Huge volumes of weed data is captured elsewhere
 - Environmental impact statements
 - Environmental impact reviews
 - Land clearing applications
 - Weed management plans
 - Aerial photography
 - Apps (DAFWA MyWeedWatch etc)
 - Citizen science engagement
 - Compliance weed spraying
 - Rangeland condition reports
 - Roadside vegetation surveys



Existing data repositories

- Digitised databases
 - ALA, AVH
 - NatureBase/FloraBase
 - Botanical consultants
 - Mining companies
- Document libraries (flora and vegetation reports)
 - WA Department of Mines and Petroleum (MINDEX)
 - Department of the Environment EPBC Public Notices
 - WA Department of Environmental Regulation (NVCs)
 - WA Environmental Protection Authority (etc etc)



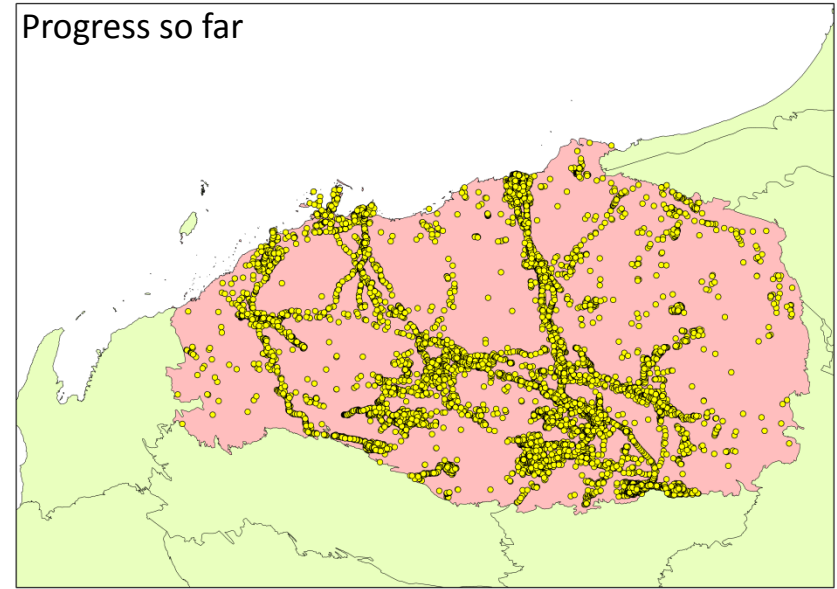
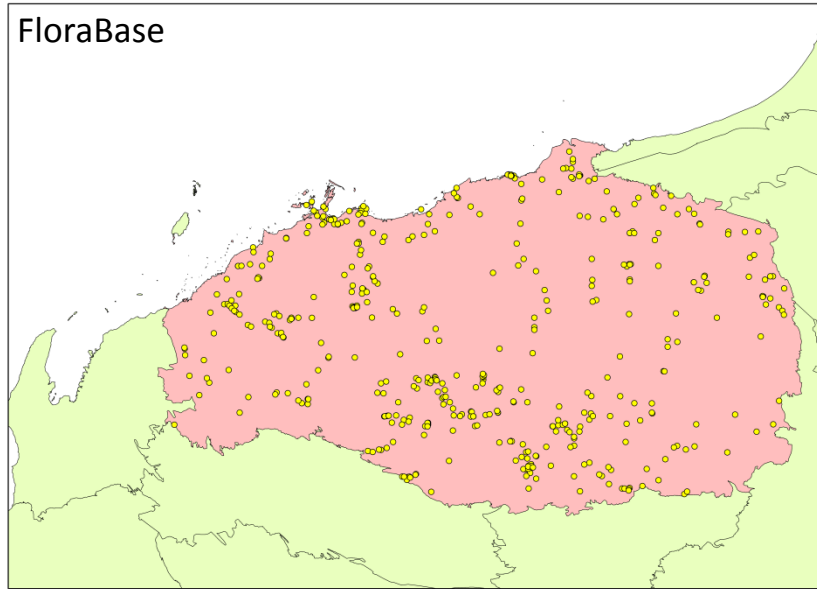
Case study – Pilbara weeds database

- Aggregate all available weeds data across the Pilbara
 - Mining activity => Pilbara flora well documented
 - Digitised & paper, online & offline sources
- Expanded & standardised field list
 - Detailed data source fields
 - Weed abundance & absence
 - Data quality estimates



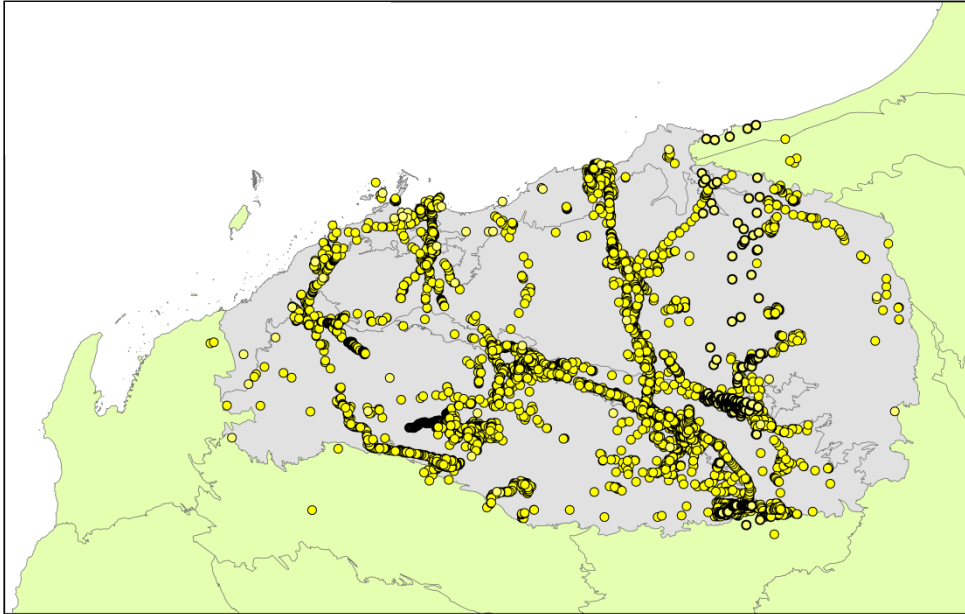
Case study – Pilbara weeds database

- FloraBase: 804 records from 114 species
- Progress so far: c. 35,000 records from 125* species



*Names as they appear in source documents, to be revised.

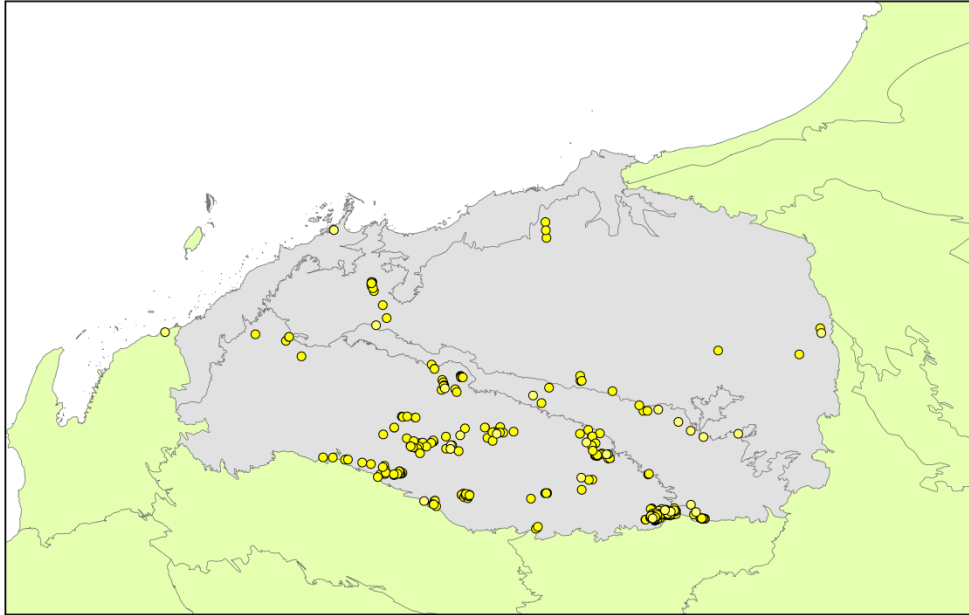
Cenchrus ciliaris (Buffel grass)



- Already known to be widespread in the Pilbara



Acetosa vesicaria (Ruby Dock)



- Not previously recognised as widespread in the Pilbara but a high risk (revegetation)
- Improved spatiotemporal coverage allows risk portals (transport links) to be identified
- Absence data can identify at risk areas

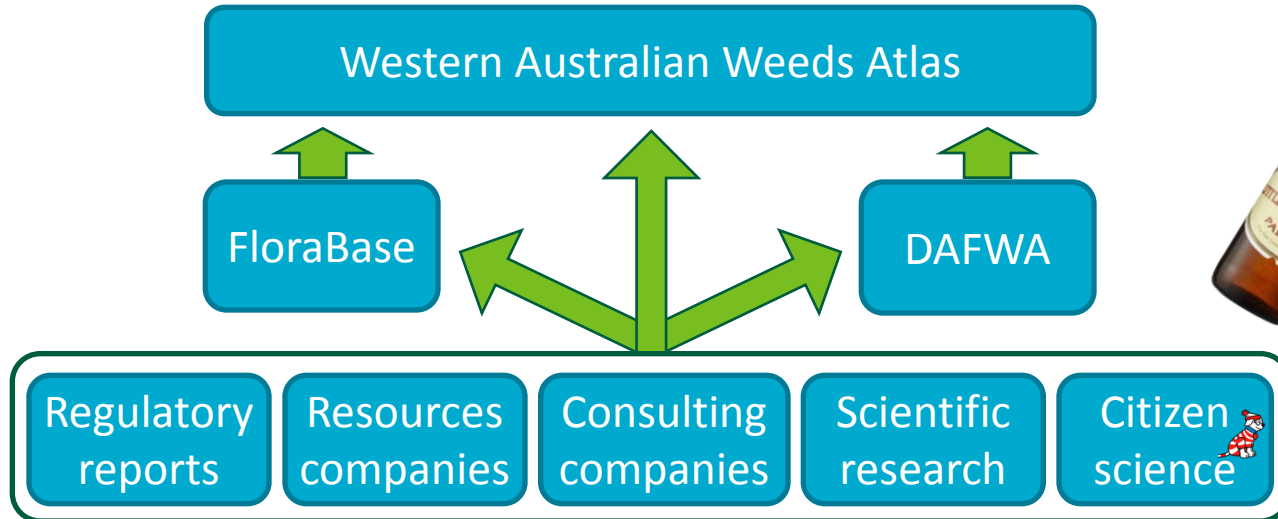
From data to management outcomes

- Manipulation
 - Quality control management & filtering
- Interrogation
 - Spatiotemporal change
 - Relationship to landscape features
 - Predictive modelling
 - Cross tenure applicability



PWD to the WAWA ...to the AuWA?

- The future of aggregated weed data for WA
 - Mixed source data
 - Quality control measures
 - Cross-organisation consolidation
 - Freely accessible online



Interested in sharing your data?

Bruce Webber
+61 8 9333 6802
bruce.webber@csiro.au
www.ecosystemchangeecology.org

PHOTO CREDITS: Bruce Webber, P. Greb, Wikimedia Commons

 @DrBruceWebber

