La biodiversité terrestre de la Polynésie française : de la conservation à la restauration

?

www.sciencemag.org • SCIENCE • VOL. 277 • 25 JULY 1997

Hopes for the Future: Restoration Ecology and Conservation Biology

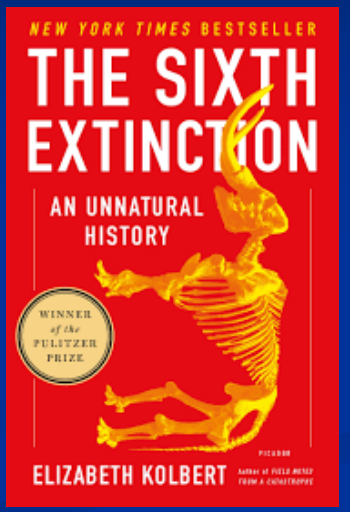
Andy P. Dobson, A. D. Bradshaw, A. J. M. Baker

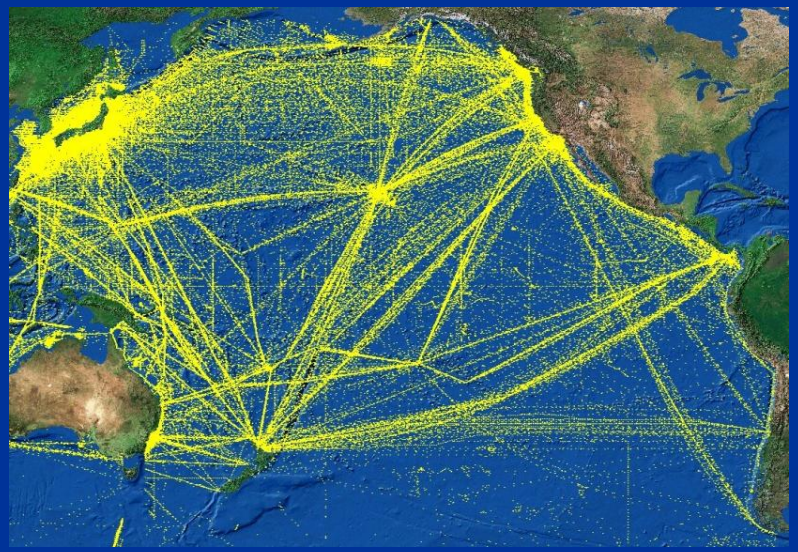
Jean-Yves Hiro MEYER (Dr.)
Délégation à la Recherche de la Polynésie française
B.P. 20981 Papeete, Tahiti & UMR 241 SECOPOL

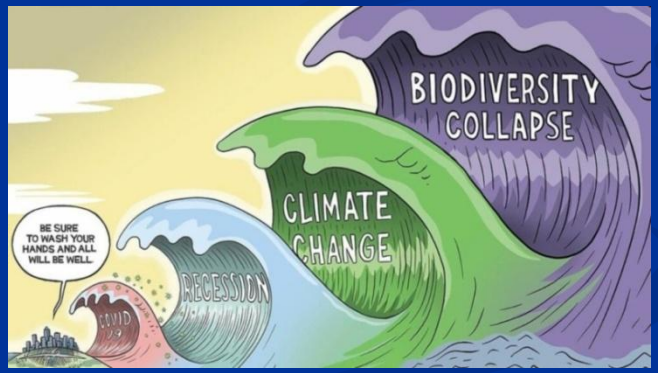
UMR 241 SECOPOL

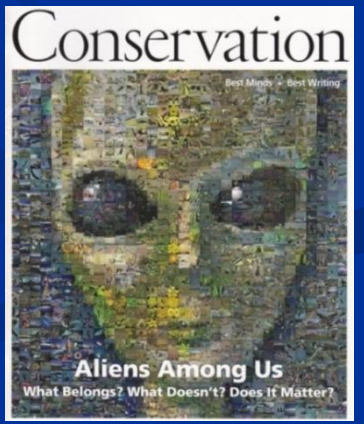
Environmental challenges

- **Globalization & Homogeinization** ("Biotic Mixing")
- **Global changes** (incl. climate change, pollutions, land uses, invasive alien species)
- **Extinction crisis**



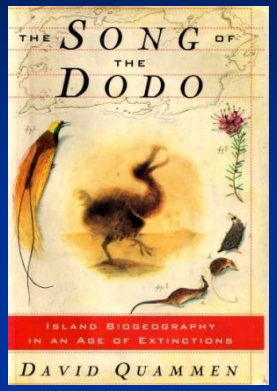


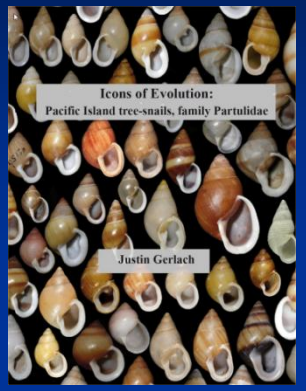


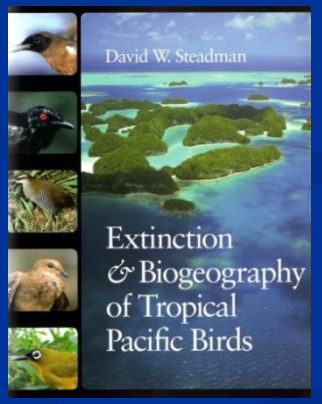


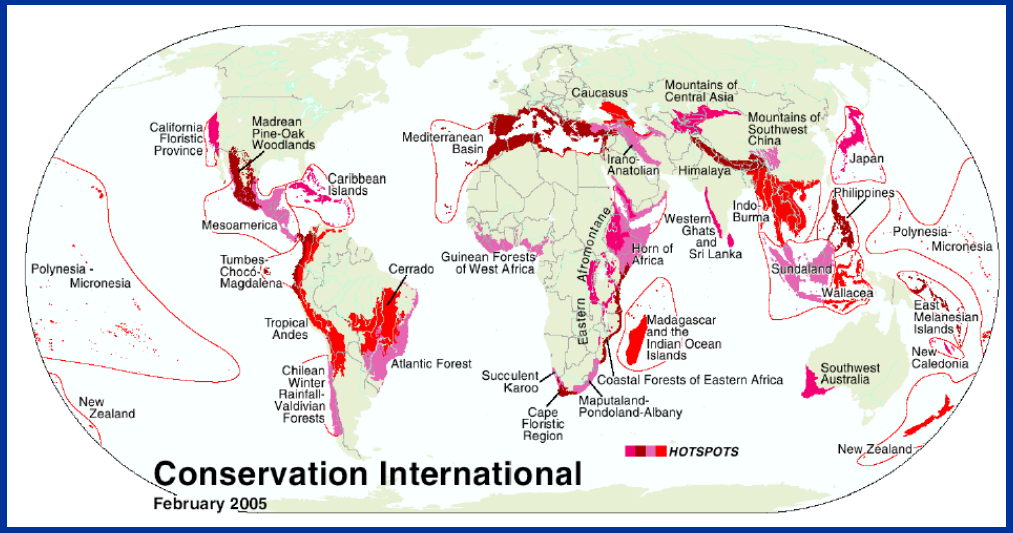
Island biodiversity at risk

- **Massive extinction events** (75% of all extinct species, 90% of all extinct birds and reptiles)
- **Endangered biota** (90% of all the threatened birds, 2.5 x more threatened plants on islands)
- **10 of the 36 "Biodiversity Hotspots"** (areas with high endemism and high level of threat)



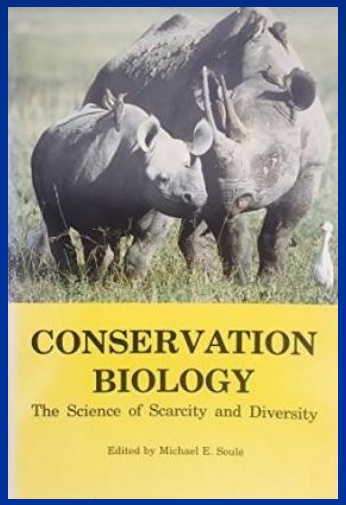




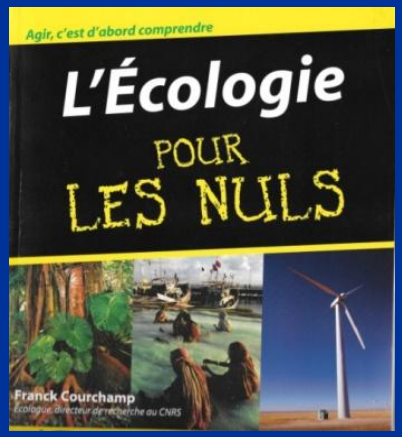


Conservation biology

- « *The Science of Scarcity and Diversity* »
(Soulé 1986)

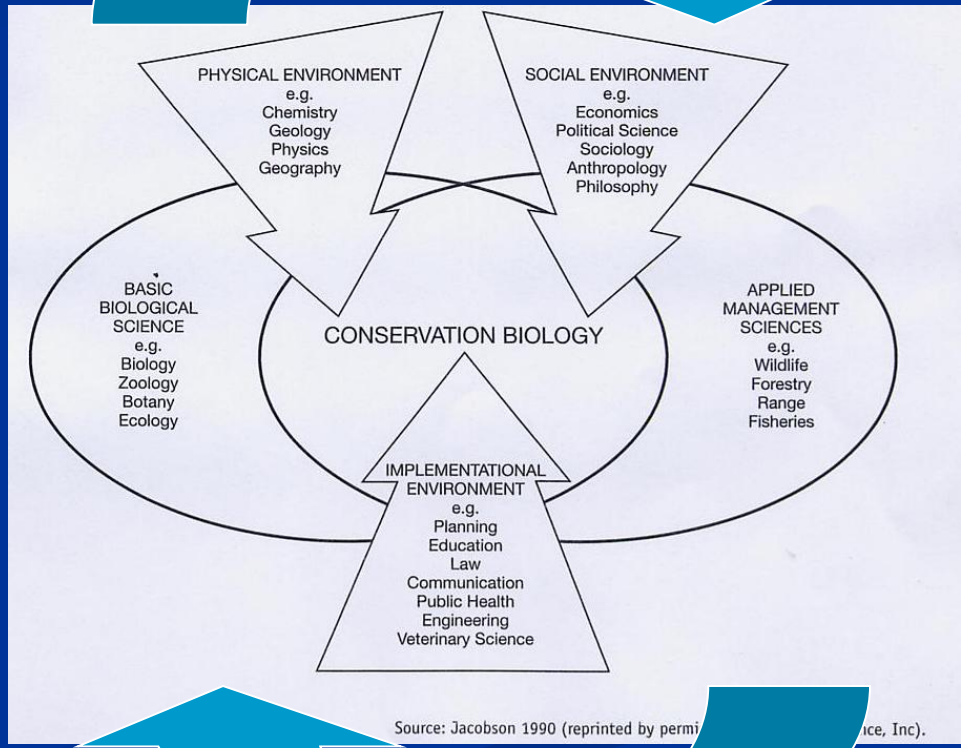


(*Plant Talk*)



- « *C'est une science extrêmement récente, profondément multidisciplinaire, une science de crises, de dilemmes, d'incertitudes* »
(Courchamp, 2009)

New ideas, principles and approaches



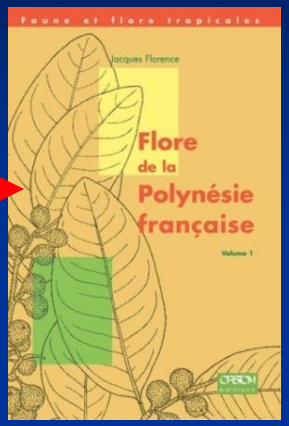
Field experiments and research needs

Data collection

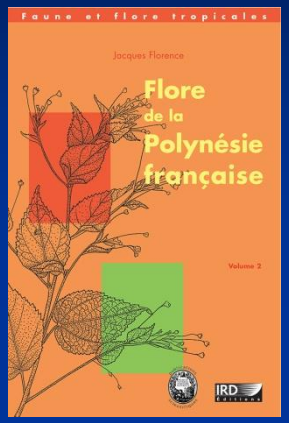

Mo'orea, 1993


Tahiti, 1999

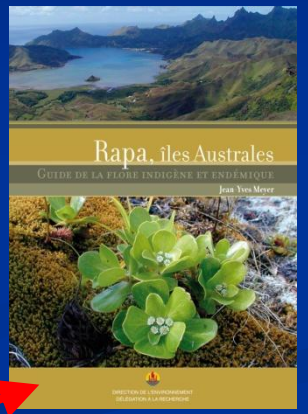
1997



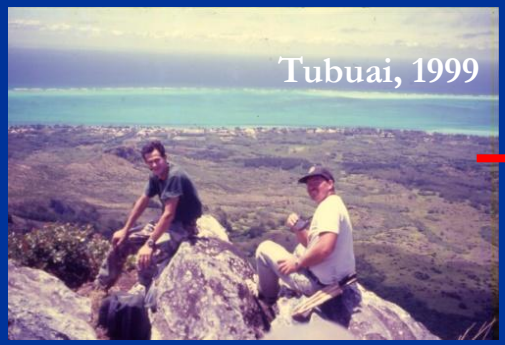
2004

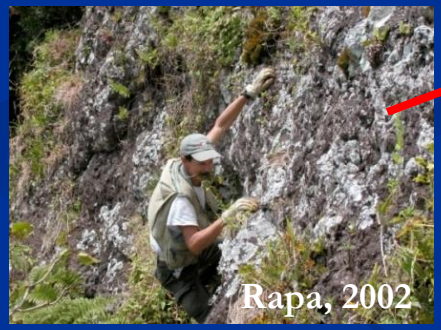


2011




Hiva Oa, 1995

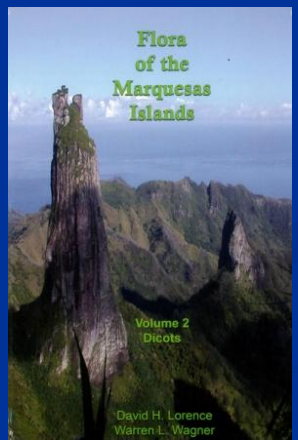

Tubuai, 1999


Rapa, 2002

2014

2016

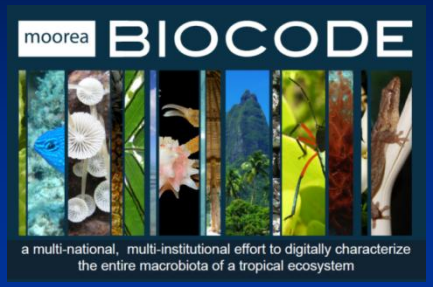
2020



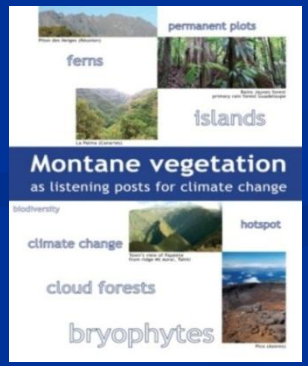

Ua Pou, 2003

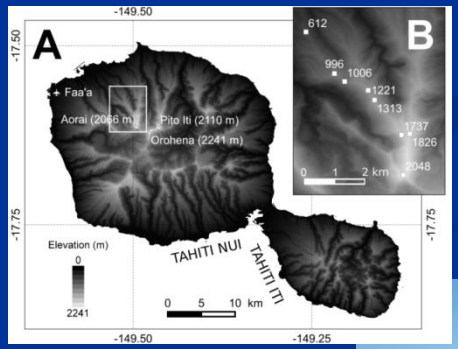
Patterns and processes

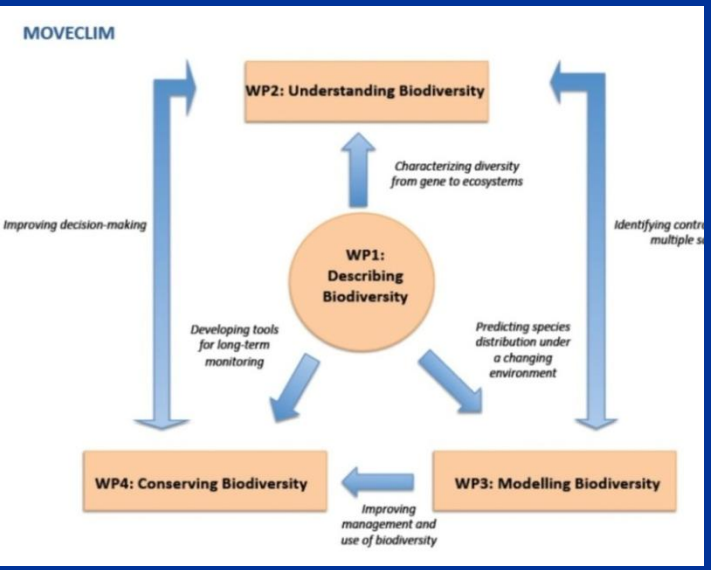
2007-2011



2012-2016







UNIVERSITÉ DE LA RÉUNION
S'ouvrir aux mondes

Understanding the past…

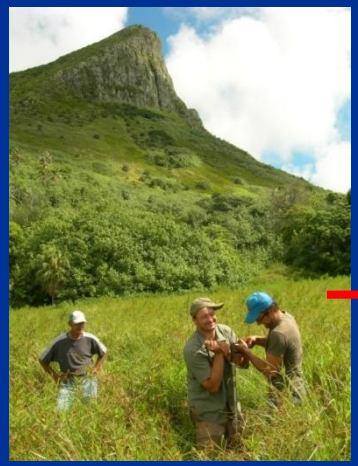
Journal of Biogeography (J. Biogeogr.) (2016)

2016

ORIGINAL ARTICLE

Abrupt late Pleistocene ecological and climate change on Tahiti (French Polynesia)

Matthew Prebble[1]*, Rose Whitau[1], Jean-Yves Meyer[2], Llewellyn Sibley-Punnett[1], Stewart Fallon[3] and Nick Porch[4]



Tubuai, 2010

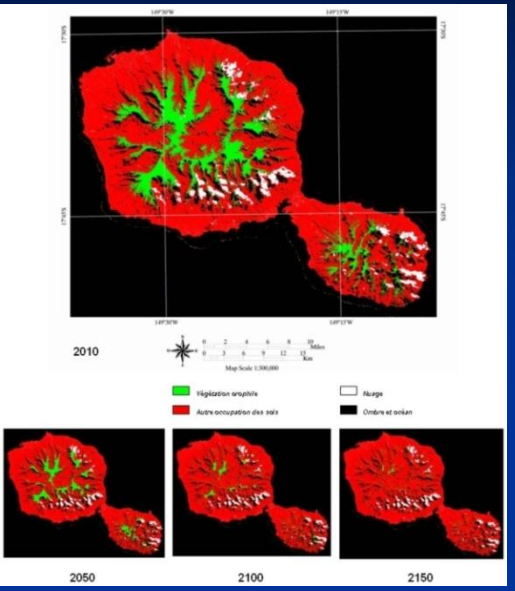
Vaifānaura'amo'orā, plateau Te Tamanu, Tahiti, 2009

4 000 ans de climat dans le sol de Nuku Hiva

Tahiti, le 13 septembre 2022 - Quatre chercheurs, trois Britanniques et un Français, sont actuellement à Nuku Hiva. Ils travaillent sur l'étude du climat à travers les siècles et son impact sur l'environnement et l'activité humaine du Pacifique. Pour comprendre le passé et anticiper l'avenir, ils effectuent des carottages qui seront analysés ultérieurement en laboratoire. Après les Marquises, cette mission scientifique conduira les chercheurs aux Australes puis à Tahiti.

plateau To'ovii, Nuku Hiva, 2022

…and predict the future



(Pouteau *et al.* 2010)

Climatic Change (2016) 138:143–156
DOI 10.1007/s10584-016-1734-x

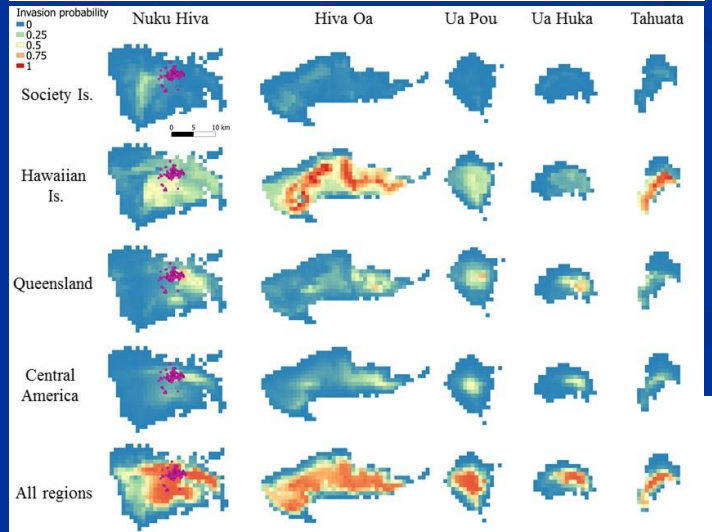
2016

Fern species richness and abundance are indicators of climate change on high-elevation islands: evidence from an elevational gradient on Tahiti (French Polynesia)

Robin Pouteau[1] · Jean-Yves Meyer[2] · Pauline Blanchard[2,3] · Joel H. Nitta[4] · Maruiti Terorotua[2] · Ravahere Taputuarai[5]

Predicting the Invasion Risk of *Miconia calvescens* in the Marquesas Islands (South Pacific): A Modeling Approach[1]

Mélanie Libeau,[2,3] Jean-Yves Meyer,[2] Ravahere Taputuarai,[4] and Robin Pouteau[5,6,7]



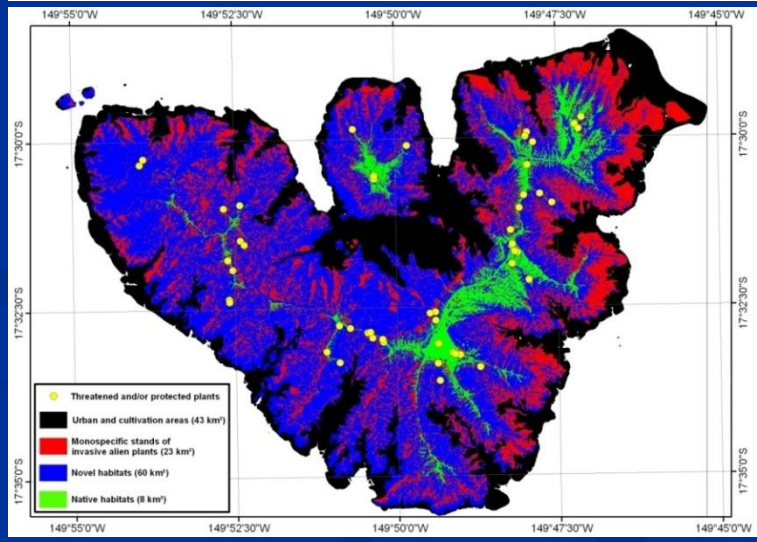
Biodivers Conserv (2015) 24:83–101
DOI 10.1007/s10531-014-0791-6

2015

ORIGINAL PAPER

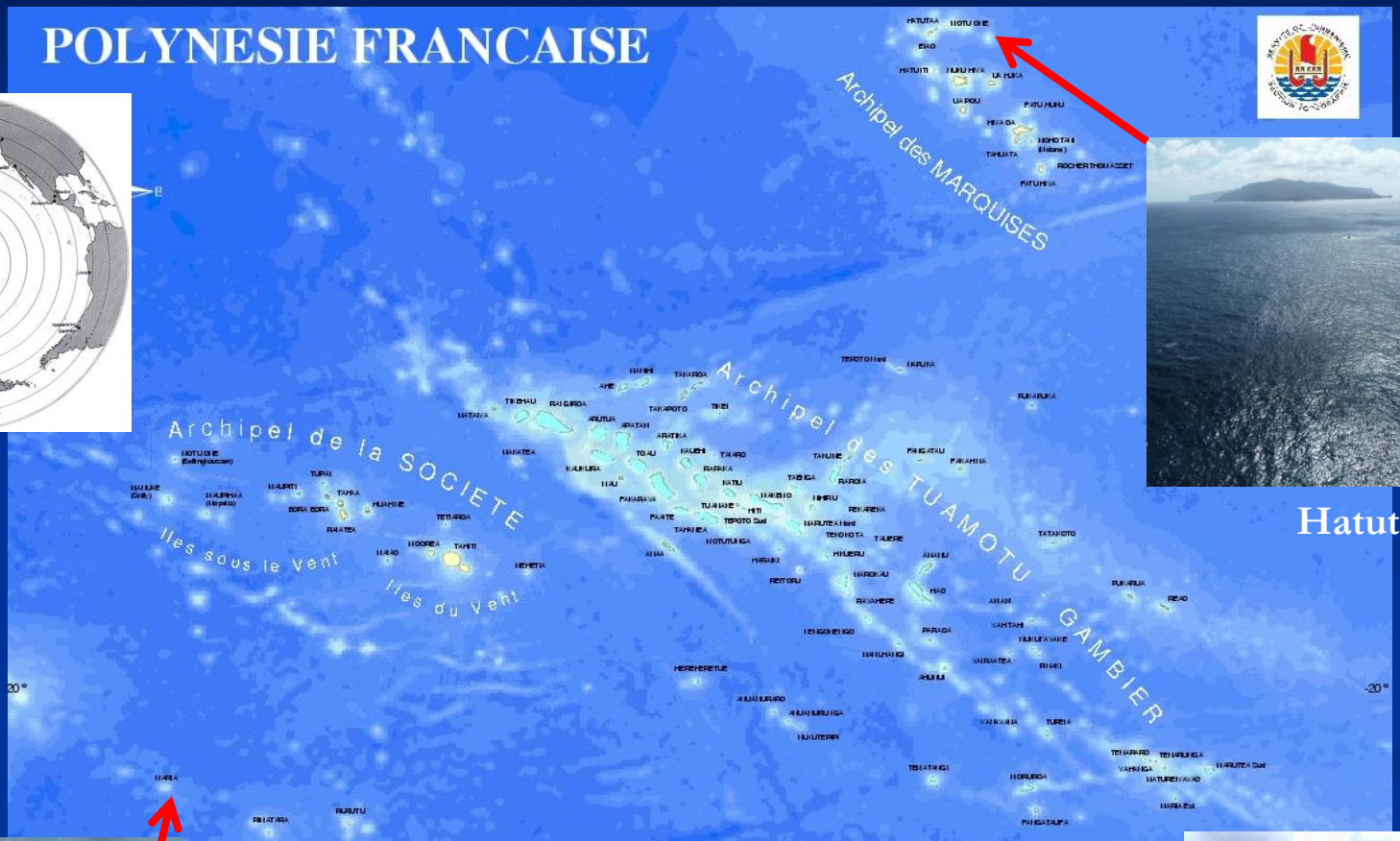
The importance of novel and hybrid habitats for plant conservation on islands: a case study from Moorea (South Pacific)

Jean-Yves Meyer · Robin Pouteau · Erica Spotswood · Ravahere Taputuarai · Marie Fourdrigniez



Pacific Science (2019), vol. 73, no. 1:17–34
doi:10.2984/73.1.2

Insularité



Hatutaa & Eiao

Maria atoll

Rapa

Diversité

- 124* îles océaniques
- 3471 km²
- 30 000 ans à 60 MA
- climat tropical et subtropical
- 41* îles hautes, presqu'atolls, îles « composites »
- 83* atolls (76 aux Tuamotu) dont 6 soulevés

(*Galzin & Meyer, 2024. *Bull. Soc. Et. Océan.* 362)

Me'etia/Meketu (Société)

Makatea (Tuamotu)

Te Pari, Tahiti Iti

Etage subalpin, Mt Orohena, Tahiti

Ua Pou (Marquises)

Lacs Roto Rahi & Roto Iti, Maiao (Societé)

Forêt sèches, Rapa (Australes)

Forêts de nuage, Mt Aorai, Tahiti

Endémisme

- **> 3000 arthropodes** (dont 1570 endémiques)
- **> 900 plantes vasculaires** (570 endémiques)
- **> 525 mollusques** (95% endemisme)
- **37 poissons d'eau douce** (15 endémiques)
- **36 oiseaux terrestres** (27 endémiques)
- **9 reptiles** (geckos & scinques)


Rhyncogonus planatus (Ua Huka)


Nacaduba tahitiensis (Tahiti)


Lentipes rubrofasciatus (Marquises) Photo : P. Keith


Microcystis sp. (Australes) Photo : O. Gargominy

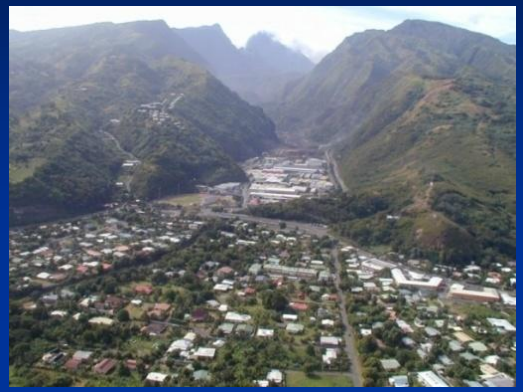

Sclerotheca (Apetahia) raiateensis (Raiatea)


Ducula galeata (Nuku Hiva)


Vini kuhlii (Rimatara)

Pressions

- Population (x 2 en 30 ans)
- Urbanisation
- Déforestation et feux
- Pollutions
- Sur-exploitation



Tahiti (Société)

Bora Bora (Société)

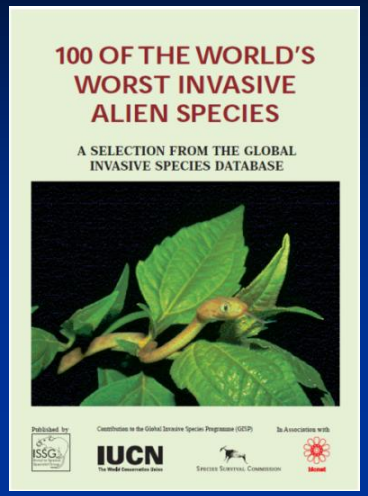
Nuku Hiva (Marquises)

Rimatara (Australes)

Tubuai (Australes)

Makatea (Tuamotu)

Invasions



CSIRO PUBLISHING

2023

RESEARCH PAPER
https://doi.org/10.1071/WR22052

WILDLIFE RESEARCH

Introduced rat assemblage affects feral cat threat to biodiversity in French Polynesian islands

P. Palmas[A,B,C,*,#], J.-Y. Meyer[D], E. Chailler[A], H. De Méringo[C,E], E. Vidal[F], J.-C. Gaertner[G], R. Bambridge[H], T. Mooroa[H], I. Hurahutia[I], G. Teatiu[J], S. Teatiu[J] and T. Timau[K]

Journal of Biogeography (1996) **23**, 775–781

1996

Tahiti's native flora endangered by the invasion of *Miconia calvescens* DC. (Melastomataceae)

Jean-Yves Meyer*† and Jacques Florence*‡ *Laboratoire de Botanique, Centre ORSTOM de Tahiti, B.P. 529, Papeete, Tahiti, French Polynesia.

Oryx Vol **33** No 3 July 1999

Extant populations of endemic partulids on Tahiti, French Polynesia

Trevor Coote, Eric Loeve, Jean-Yves Meyer and Dave Clarke

1999

A. Samaniego, R. Griffiths, M. Gronwald, F. Murphy, M. Le Rohellec, S. Oppel, J-Y. Meyer & J. C. Russell /
Conservation Evidence (2020) **17**, 12-14

2020

A successful Pacific rat *Rattus exulans* eradication on tropical Reiono Island (Tetiaroa Atoll, French Polynesia) despite low baiting rates

Araceli Samaniego[1*], Richard Griffiths[2], Markus Gronwald[1], Frank Murphy[3], Moana Le Rohellec[3], Steffen Oppel[4], Jean-Yves Meyer[5] & James C. Russell[1]

Critical issues and new challenges for research and management of invasive plants in the Pacific Islands

JEAN-YVES MEYER[1]

2014

Table 1. Comparison between native and alien flora (flowering plants and ferns) in selected Pacific tropical islands (by size of terrestrial area) and number of naturalized and invasive alien plants (including dominant or major IAP).

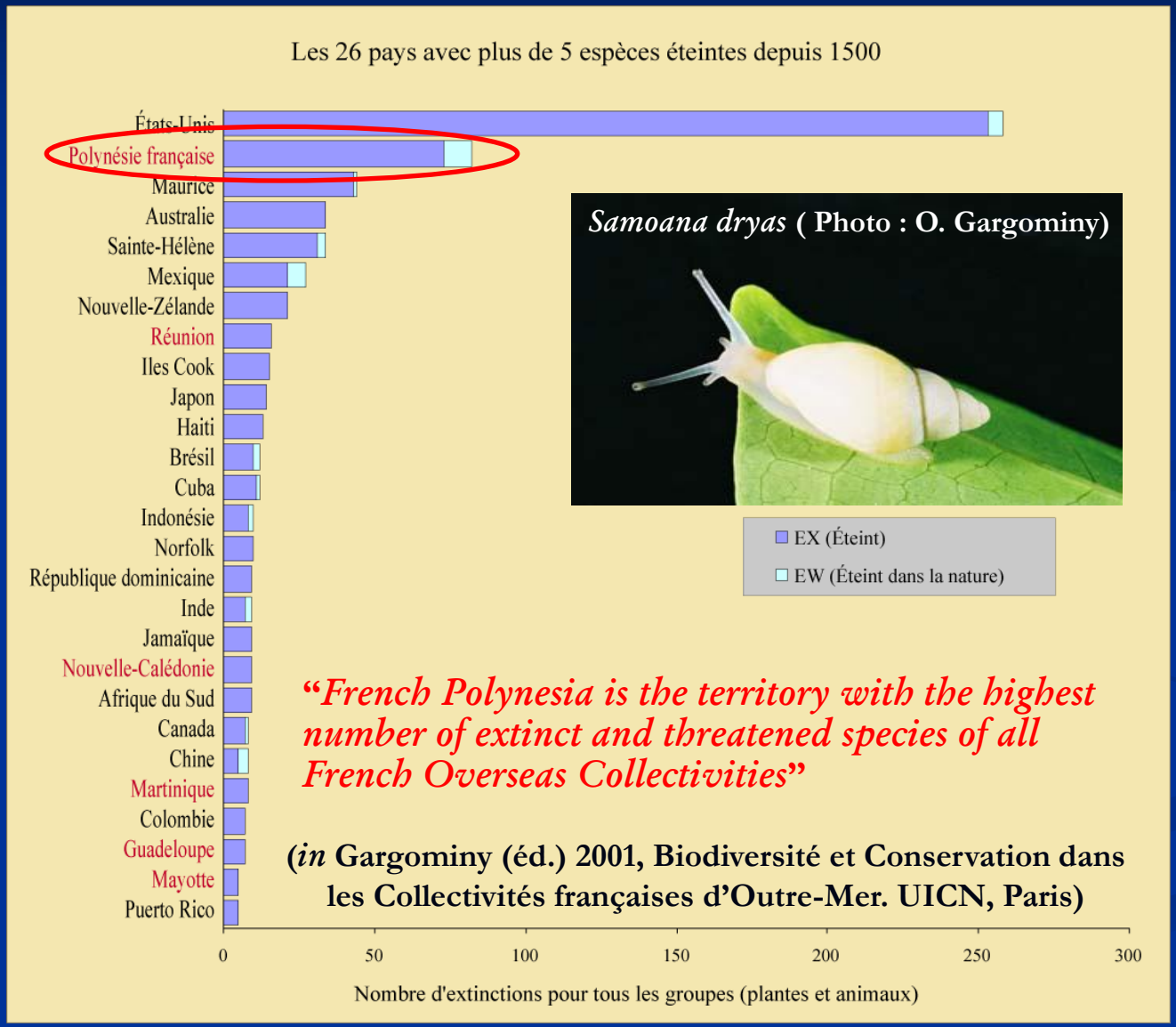
Island or island group	Area (km²)	Native flora (number of indigenous species)	Alien flora (number of introduced species)	Naturalized alien plant species	Invasive alien plant species	Dominant IAP
New Caledonia	19 060	3 261[a]	2 008[b]	597[b]	97[c]	67[b]
Fiji	18 270	1 622[d]	977[d]	461[d]	107[e]	30[f]
Hawai'i	16 880	1 138[g]	8 134[h]	1 104[i]	469[i]	86[j]
Galápagos	7 900	550[k]	870[l]	220[l]	109[l]	22[l]
French Polynesia	3 519	885[m]	> 1 700[n]	593[n]	-	57[n]
Cook Is.	238	296[o]	997[o]	333[o]	76[p]	12[q]
Rapa Nui (Easter Island)	166	48[r]	370[s]	180[s]	-	36[s]
Wallis et Futuna	142	351[t]	338[u]	151[u]	-	18[u]

[a]Jaffré *et al.* 2004, [b]Meyer *et al.* 2010, [c]Hequet *et al.* 2009, [d]Brownlie 1977 and Smith 1996, [e]GISD, [f]Meyer 2000, [g]Wagner *et al.* 1999, [h]Staples and Herbst 2005, [i]Staples and Cowie 2001, [j]Smith 1985, [k]Mauchamp 1997, Trueman *et al.* 2010, [l]Florence *et al.* 2007, [m]Fourdrigniez and Meyer 2008, [n]McCormack 2007, [o]Space and Flynn 2002, [p]Meyer 2004, [q]Dubois *et al.* 2013, [r]Meyer 2008, [s]Morat *et al.*, [t]Meyer *et al.* 2010

[1]Délégation à la Recherche, Government of French Polynesia, B.P. 20981 Papeete, Tahiti. jean-yves.meyer@recherche.gov.pf

PACIFIC CONSERVATION BIOLOGY Vol. 20(2): 146–164. Surrey Beatty & Sons, Sydney. 2014.

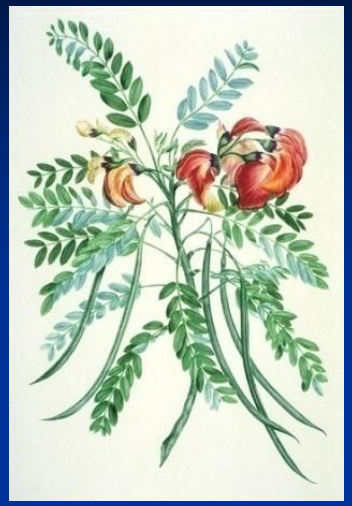
Extinctions



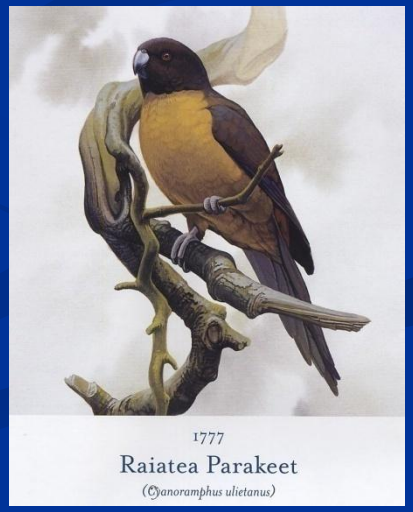
Samoana dryas (Photo : O. Gargominy)

"*French Polynesia is the territory with the highest number of extinct and threatened species of all French Overseas Collectivities*"

(*in* Gargominy (éd.) 2001, Biodiversité et Conservation dans les Collectivités françaises d'Outre-Mer. UICN, Paris)



Sesbania coccinea subsp. atollensis var. parkinsonii (Sydney Parkinson, 1773)

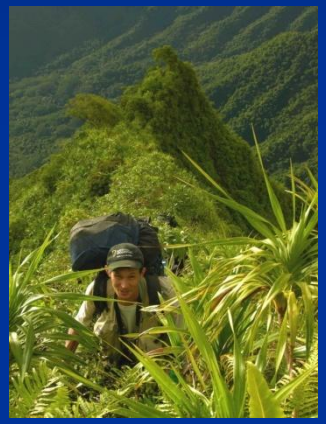


Cyanoramphus ulietanus

Vulnérabilité

- Oiseaux : 11 CR, 17 EN, 13 VU
- Plantes : 118 CR, 134 EN, 50 VU

2015



2007

Number 740 November 2007

OCCASIONAL PAPERS OF THE MUSEUM OF ZOOLOGY UNIVERSITY OF MICHIGAN

ANN ARBOR, MICHIGAN

A NEW SPECIES OF LAND SNAIL (STYLOMMATOPHORA: PARTULIDAE) FROM RAIATEA, FRENCH POLYNESIA, OCEANIA[1]

John B. Burch[2]

ABSTRACT – A newly discovered land snail species, *Partula meyeri* n. sp., of the highly threatened South Pacific pulmonate gastropod family Partulidae, is described for Raiatea, one of the Society Islands, French Polynesia. This

2017

Reassessment of the *Psychotria speciosa* G. Forst. (Rubiaceae) complex in Tahiti, Society Islands, with a new combination and description of new species, *Psychotria paulae* J.-Y. Meyer, Lorence & J. Florence, sp. nov.

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Published on 30 June 2017

PhytoKeys 42: 39–47 (2014)
doi: 10.3897/phytokeys.42.8408
http://phytokeys.pensoft.net

RESEARCH ARTICLE

A peer-reviewed open-access journal
PhytoKeys
Launched to accelerate biodiversity research

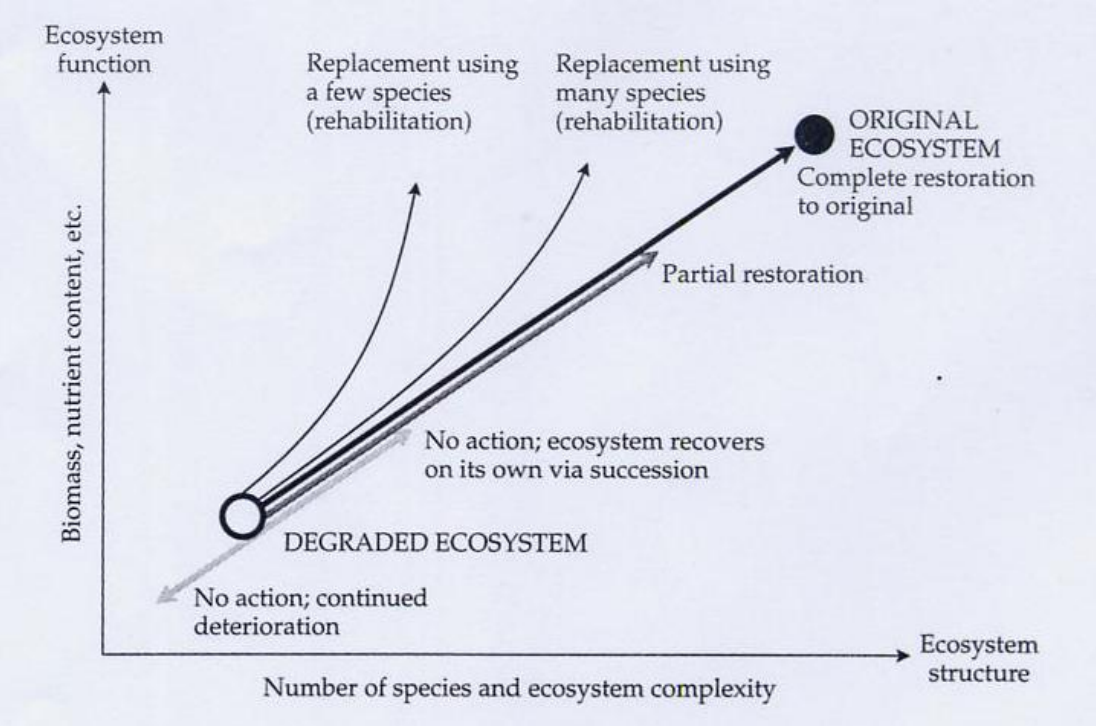
Bidens meyeri (Asteraceae, Coreopsideae): a new critically endangered species from Rapa, Austral Islands

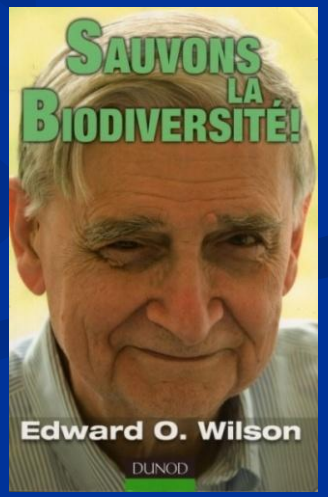
Vicki A. Funk[1], Kenneth R. Wood[2]

2014

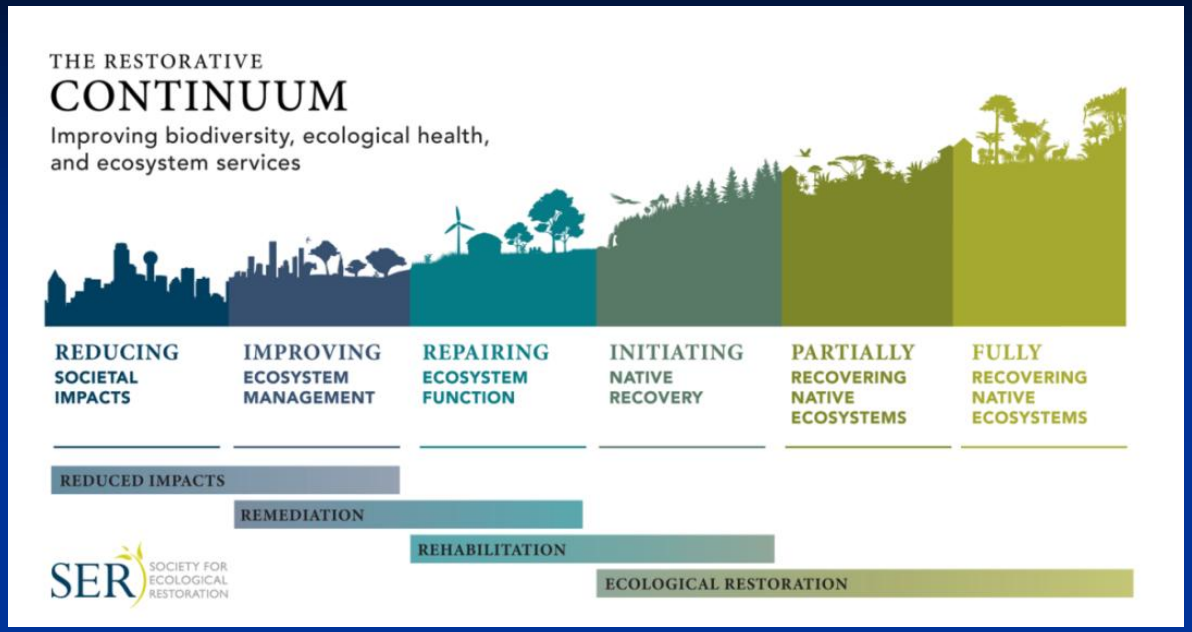
Ecological restoration

➢ *"Process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed"* (*www.ser.org*)

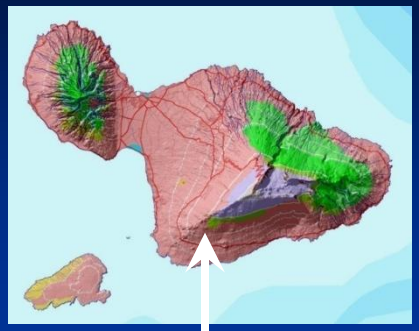




"The next century will, I believe, be the era of restoration in ecology" (Wilson 1992)



USGS



1997

www.auwahi.org

Rapa Nui, 2012

New Caledonia, 2011

?

2014

De Auwahi (Maui) à Maraeti'a (Tahiti)
L'alliance entre les scientifiques et les communautés locales pour la restauration de forêts naturelles menacées

(Medeiros *et al.*, 2018. *Bull. Soc. Et. Océan.*)

TE RAU ATI ATI A TAU A HITI NOA TU

PLANT ECOLOGY & DIVERSITY
https://doi.org/10.1080/17550874.2019.1584651

2019

Taylor & Francis
Taylor & Francis Group

ARTICLE

Check for updates

Short-term recovery of native vegetation and threatened species after restoration of a remnant forest in a small oceanic island of the South Pacific

Jean-Yves Meyer[a], Tiffany Laitame[b] and Jean-Claude Gaertner[c]

[a]Délégation à la Recherche, Gouvernement de la Polynésie française, Tahiti, French Polynesia; [b]UMR-241 EIO, Université de la Polynésie française, Tahiti, French Polynesia; [c]UMR-241 EIO, Institut de Recherche pour le Développement, Tahiti, French Polynesia

BioControl (2012) 57:191–198
DOI 10.1007/s10526-011-9402-6

Restoring habitat for native and endemic plants through the introduction of a fungal pathogen to control the alien invasive tree *Miconia calvescens* in the island of Tahiti

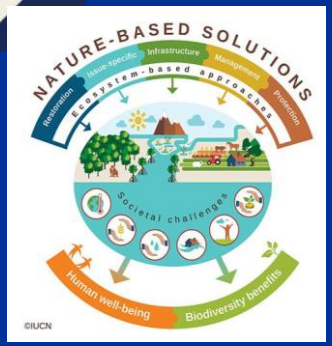
Jean-Yves Meyer · Marie Fourdrigniez · Ravahere Taputuarai

2012

Raumataariki

2021-2023

?



2024-2026

Onetahi, Teti'aroa

TE DRA NAHO
Fédération des Associations de Protection de l'Environnement

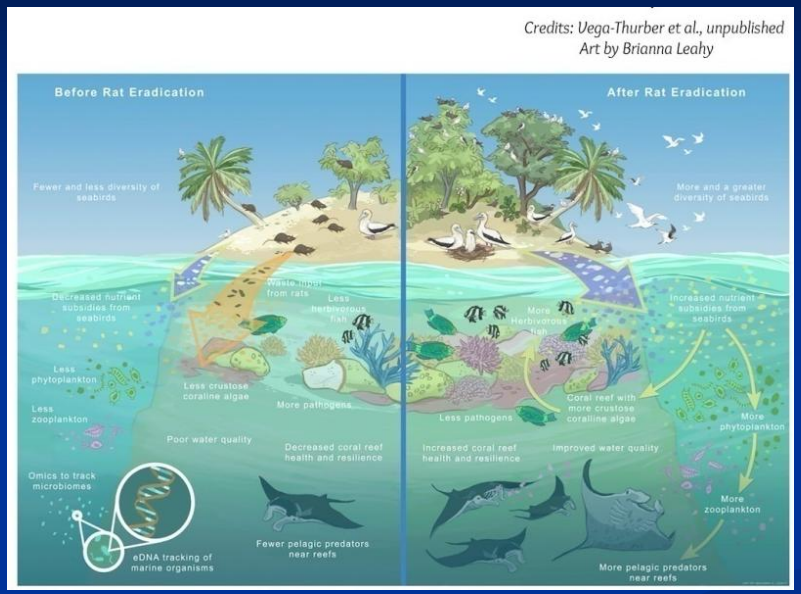
UICN | Comité Français

Tahitian Historical Society

Te mana o te moana

Monitoring

2018-on going



TETIAROA society
• SUSTAINABILITY IN ACTION •

Pandanus tectorius dense forest in rat-free unihnabited atoll of Morane (Tuamotu)

?

?

Pisonia grandis dense forest

Rat-free motu in Tetiaroa

Conclusions

(Le Canard Enchaîné, 2017)

2007

BOIS ET FORÊTS DES TROPIQUES, 2007, N° 291 (1)
ÉCOTOURISME ET AIRES PROTÉGÉES
POLYNÉSIE FRANÇAISE
25

Conservation des forêts naturelles et gestion des aires protégées en Polynésie française

Jean-Yves MEYER

Délégation à la recherche (Gouvernement de Polynésie française)
BP 20981, Papeete, Tahiti
Polynésie française

Conservation et gestion des milieux naturels terrestres aux îles Marquises : enjeux, contraintes et opportunités

Jean-Yves Meyer[1]

2016

TRANSLATIONAL ECOLOGY

Foundations of translational ecology 2017

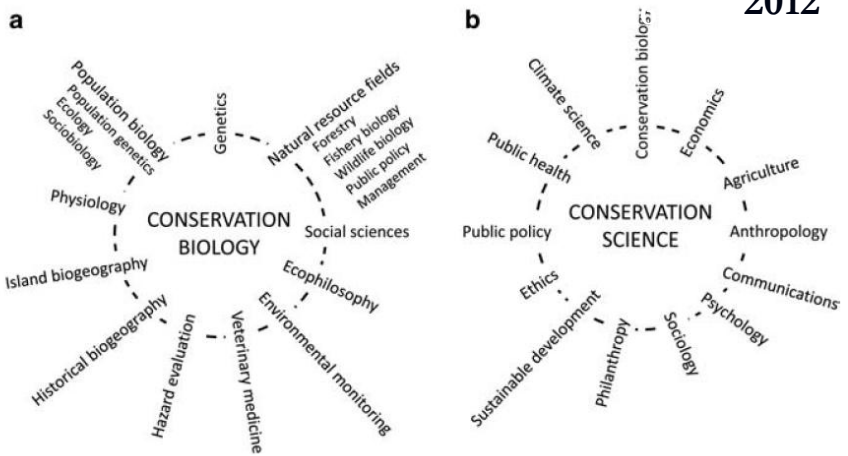
Carolyn AF Enquist[14], Stephen T Jackson[1], Gregg M Garfin[2], Frank W Davis[3], Leah R Gerber[4], Jeremy A Littell[5], Jennifer L Tank[6], Adam J Terando[7], Tamara U Wall[8], Benjamin Halpern[3,9], J Kevin Hiers[10], Toni Lyn Morelli[11], Elizabeth McNie[12], Nathan L Stephenson[13], Matthew A Williamson[14], Connie A Woodhouse[15], Laurie Yung[16], Mark W Brunson[17], Kimberly R Hall[18], Lauren M Hallett[19], Dawn M Lawson[20], Max A Moritz[21], Koren Nydick[22], Amber Pairis[23], Andrea J Ray[24], Claudia Regan[25], Hugh D Safford[14,26], Mark W Schwartz[14], and M Rebecca Shaw[27]

What Is Conservation Science?

BioScience • *November 2012 / Vol. 62 No. 11*

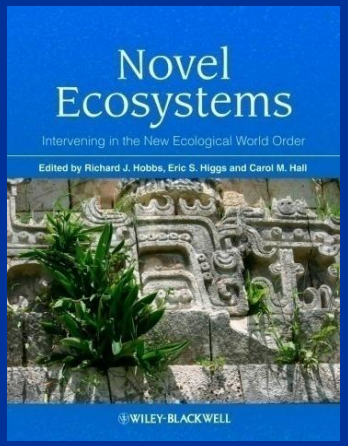
PETER KAREIVA AND MICHELLE MARVIER

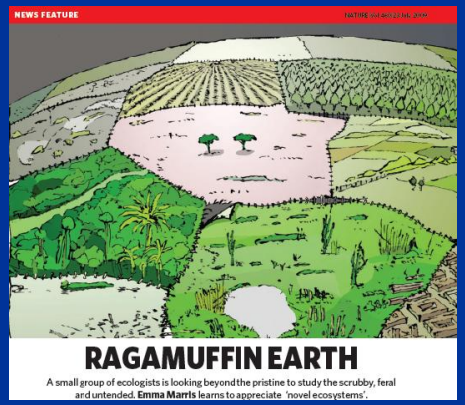
2012

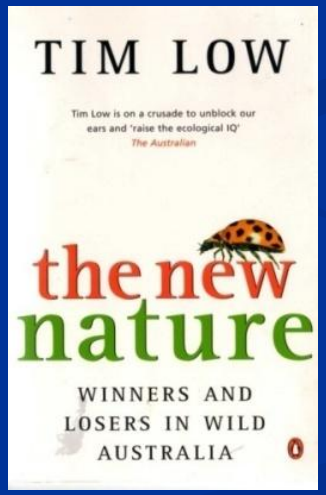


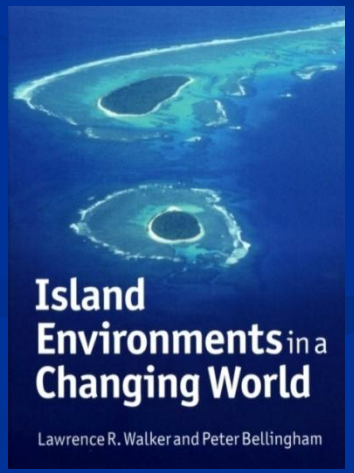
Défis futurs

➢ Vers de nouvelles stratégies et modes de conservation dans des écosystèmes « nouveaux » … et dans un contexte de changements locaux et globaux !

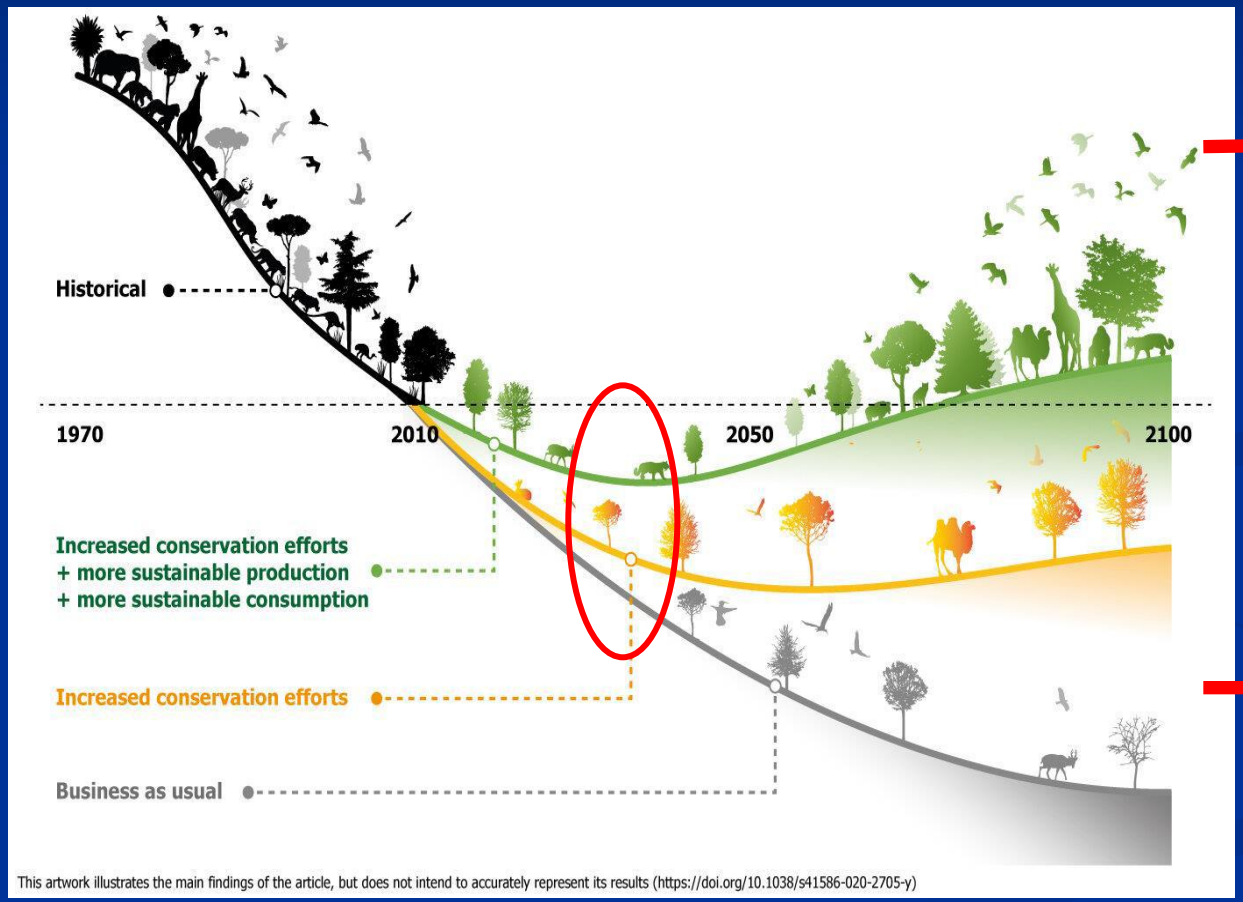








Scenarii futurs



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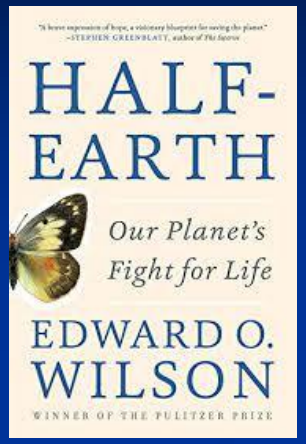
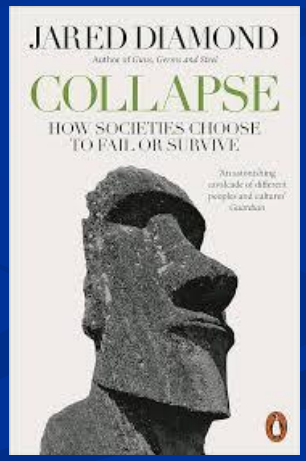


2016



2005