

What is the value of biotic seed dispersal in post-fire forest regeneration?



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Wildfires

Wildfires are a **natural disturbance** in many parts of the planet.

Global changes are **altering fire regimes** with severe consequences for forest composition and dynamics.

Southern European countries are particularly **vulnerable** to wildfires.



Post-fire recovery

Active reforestation



Planting



Sowing



Post-fire recovery

Natural regeneration



Seeder



Resprouter



Abiotic
Dispersal



Biotic
Dispersal
epizoochory



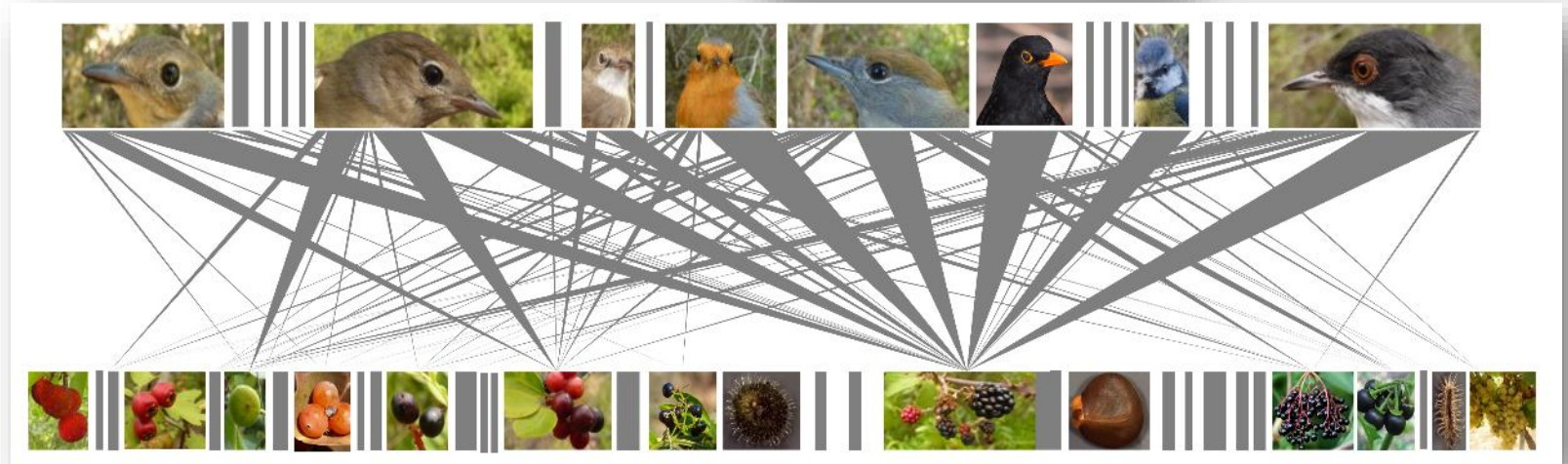
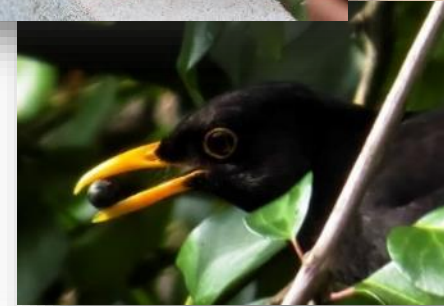
endozoochory



Biotic seed dispersal (syndromes) – birds and fleshy fruits

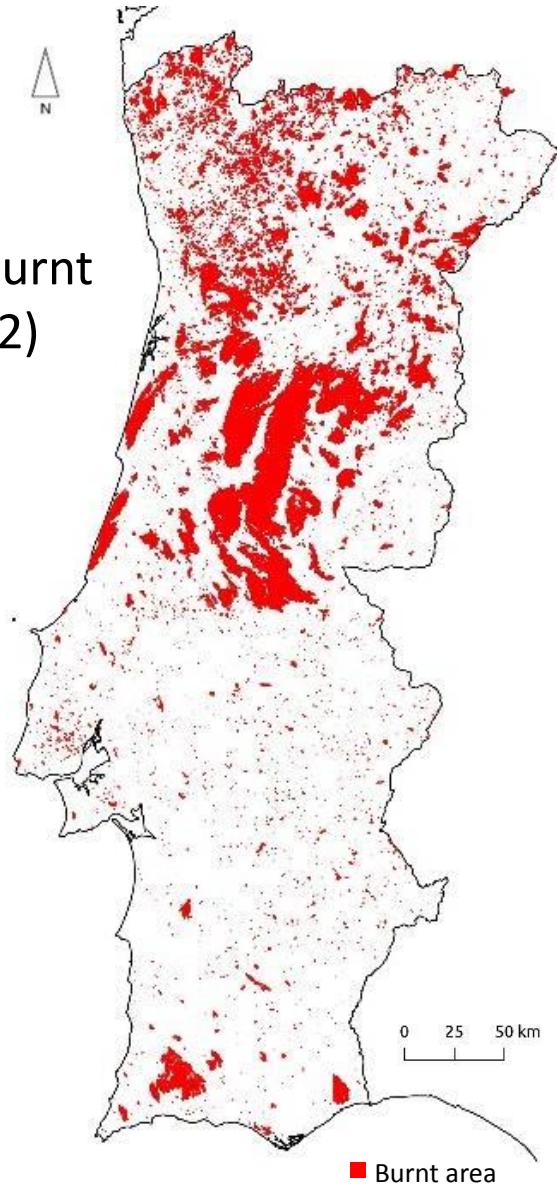


Biotic seed dispersal (syndromes) – birds and fleshy fruits



Wildfires and post-fire recovery in Portugal

981,190 ha burnt
(2015-2022)



**19% of the
burnt area**
(186,426 ha)



**81% of the
burnt area**
(794,764 ha)



Weighted dependency on biotic seed dispersal

Portuguese native flora (477 plant species with information available for fire-coping strategies)



Seeder

206.7 (44%)



Resprouter

125.3 (27%)



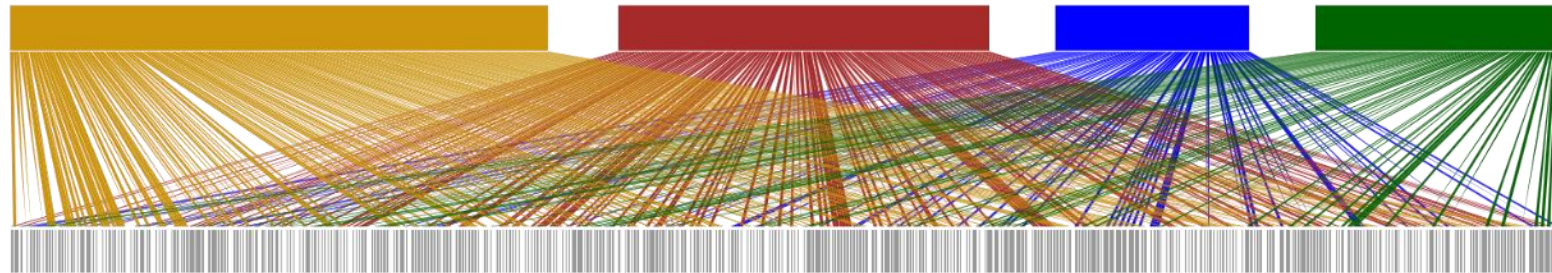
Abiotic dispersal

59.5 (13%)



Biotic dispersal

73.5 (16%)



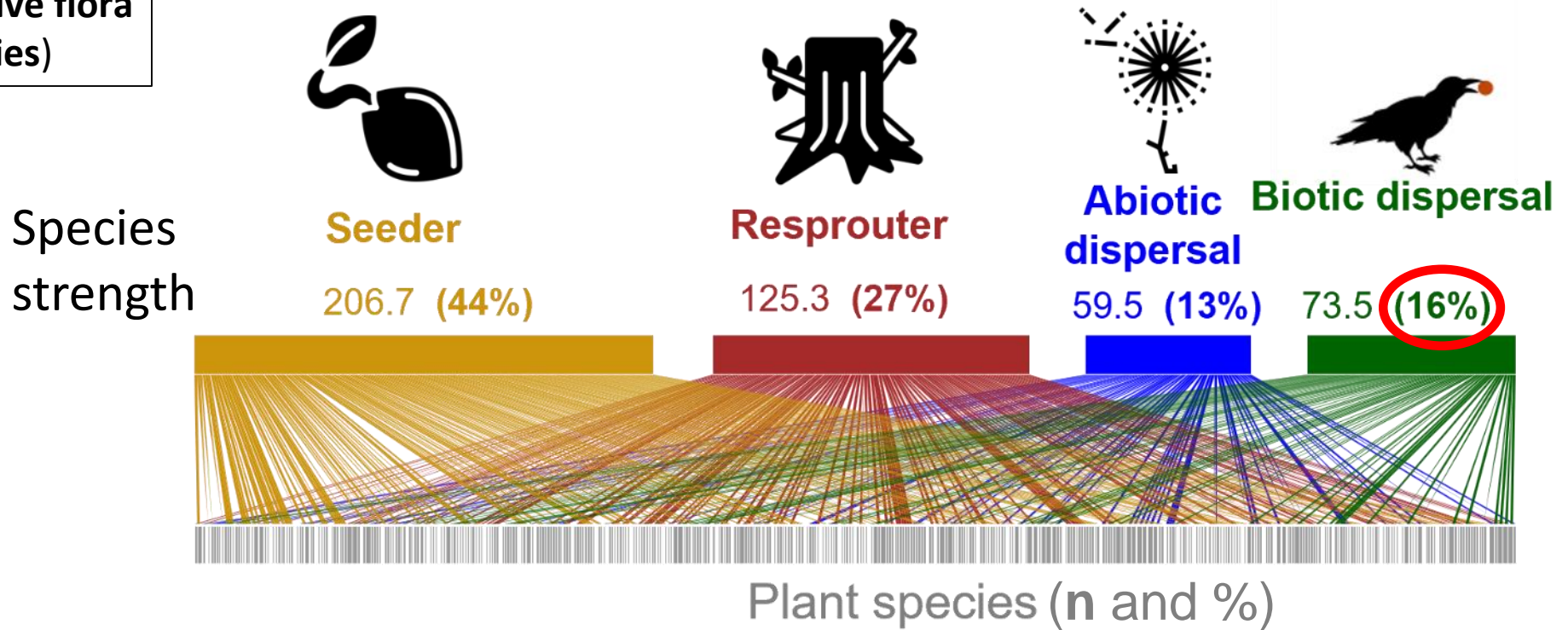
Plant species

Flora-On, BROT, and
EuDis databases

R 4.2.1 package bipartite 2.17

Weighted dependency on biotic seed dispersal

Portuguese native flora
(477 plant species)



Species with strategy	367 (78%)	255 (54%)	132 (28%)	<u>166</u> (35%)
Species exclusively with one strategy	95 (20.2%)	30 (6.4%)	2 (0.4%)	<u>8</u> (1.7%)

Weighted dependency on biotic seed dispersal

Portuguese native flora
(477 plant species)



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Abiotic dispersal

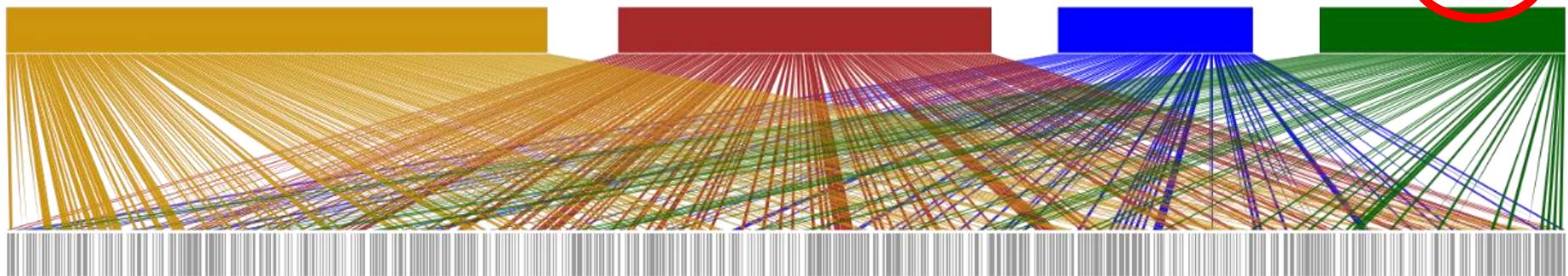
59.5 (13%)



Biotic dispersal

73.5 (16%)






Species strength



Plant species

Valuing biotic seed dispersal

Replacement Cost analysis


$$\frac{\text{Cost of active restoration (€)}}{\text{Restored area (ha)}} \times \text{Burnt and unrestored area (ha)} \times \text{Relative strength of biotic dispersal} = \text{Total value of biotic seed dispersal}$$


Valuing biotic seed dispersal

Replacement Cost analysis

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1,450 €/ha 99,403 ha/yr 16%

23 M€/yr
(232€/ha/yr)

Value of abiotic seed dispersal estimated at 18.7 M€/yr

In Europe **13% of bird species** and **15% of mammal species** are **threatened** with extinction.

This **erodes the resilience of European forests** to endure wildfires and other threats.

Therefore, putting forward the importance of these dispersers is key in the **protection of forests**.

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Conservation Letters

MUITO OBRIGADO!!



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