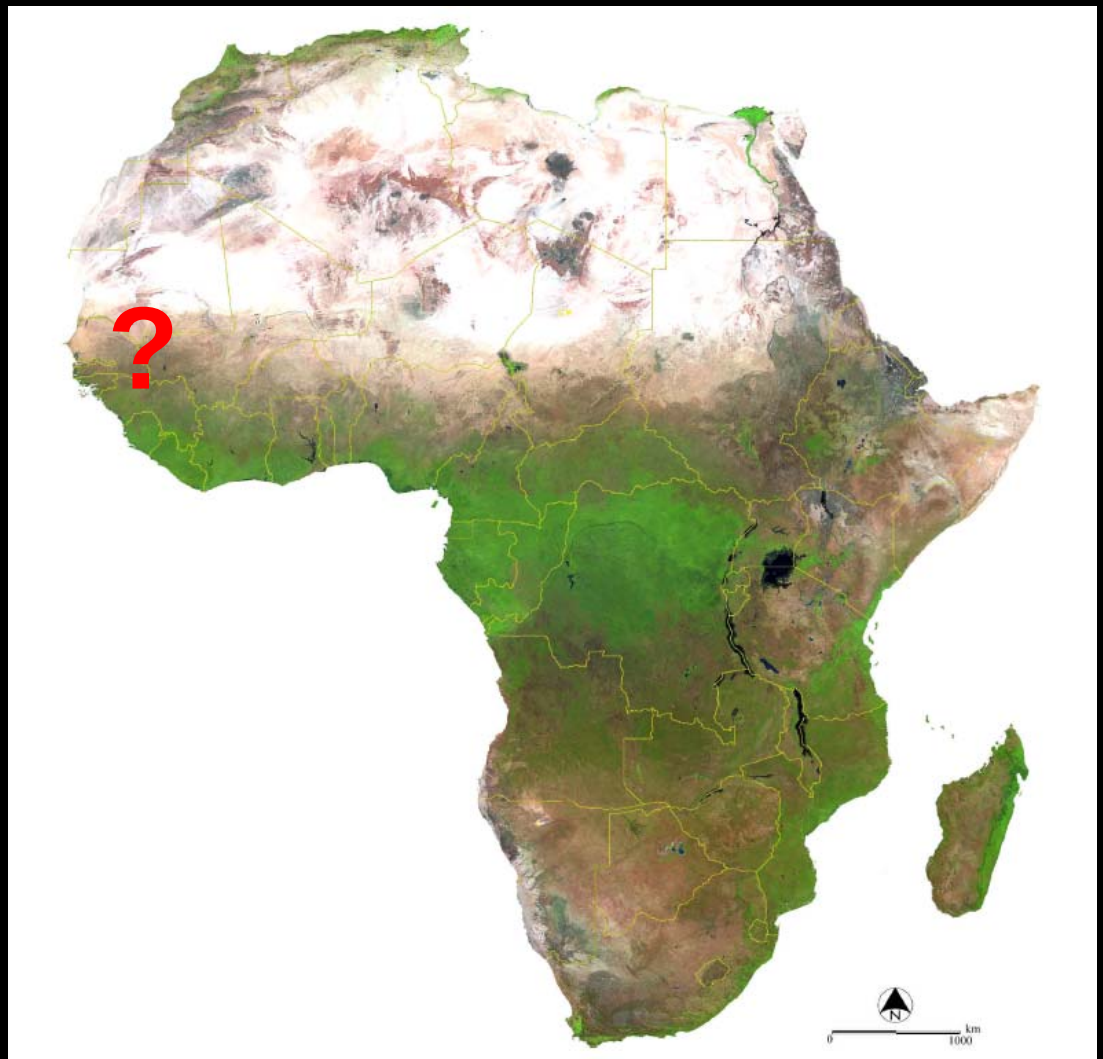
Identifying *potential* aquatic warbler wintering sites using remote sensing



Aquatic warbler wintering areas

- Wintering records from widely distributed sites across west Africa
- Previous attempts to identify wintering areas have been very broad
- Known to winter in Djoudj

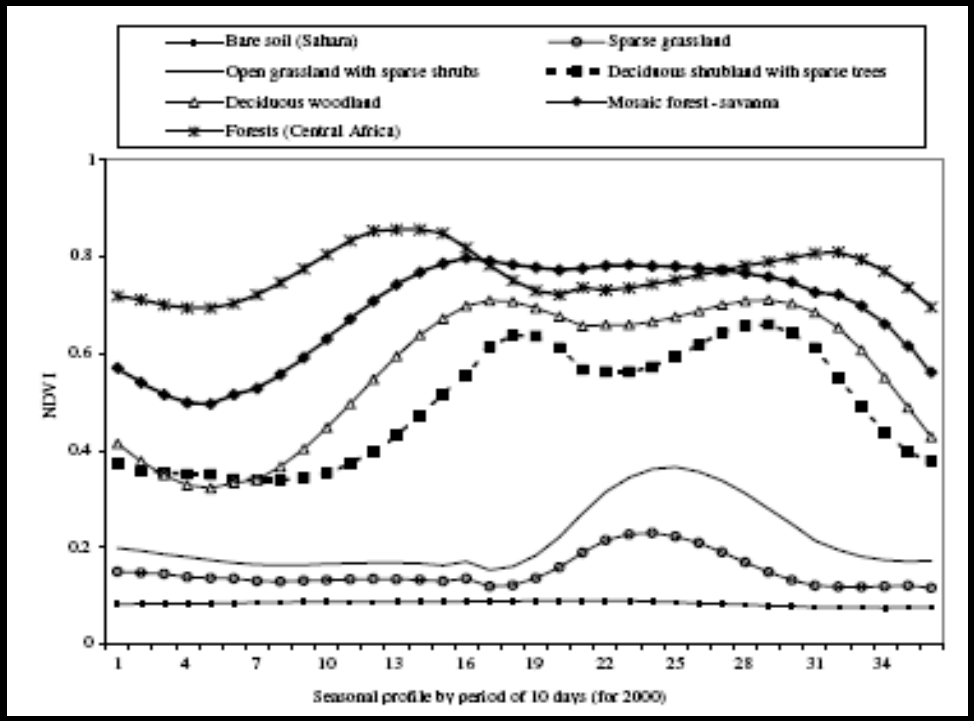
> So, where is similar to the occupied habitat in Djoudj ?

Use of satellite image data

- Potential of sat image data in modelling potential distributions established (e.g. great bustard, little bustard, black grouse, Gurney's pitta)
- Objective assessment of large areas
- Data available at appropriate resolution (1km)
  - Possible to target sites

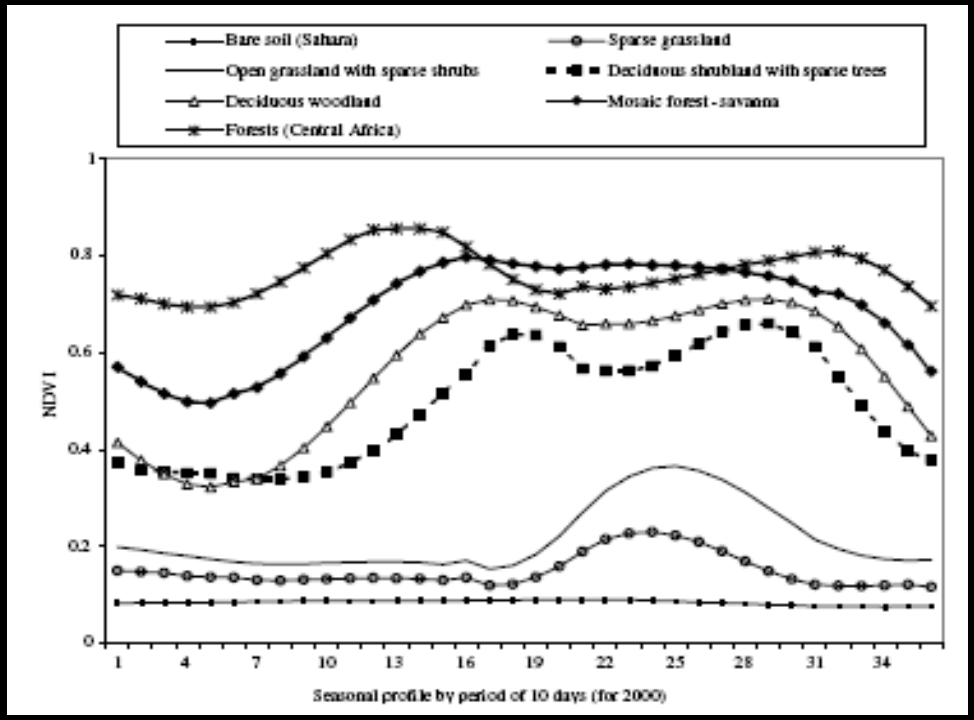
Inputs

- NDVI (Normalised Difference Vegetation Index) from SPOT – Vegetation sensor
- Maximum values for 36 dekads (10-day periods) across 2007



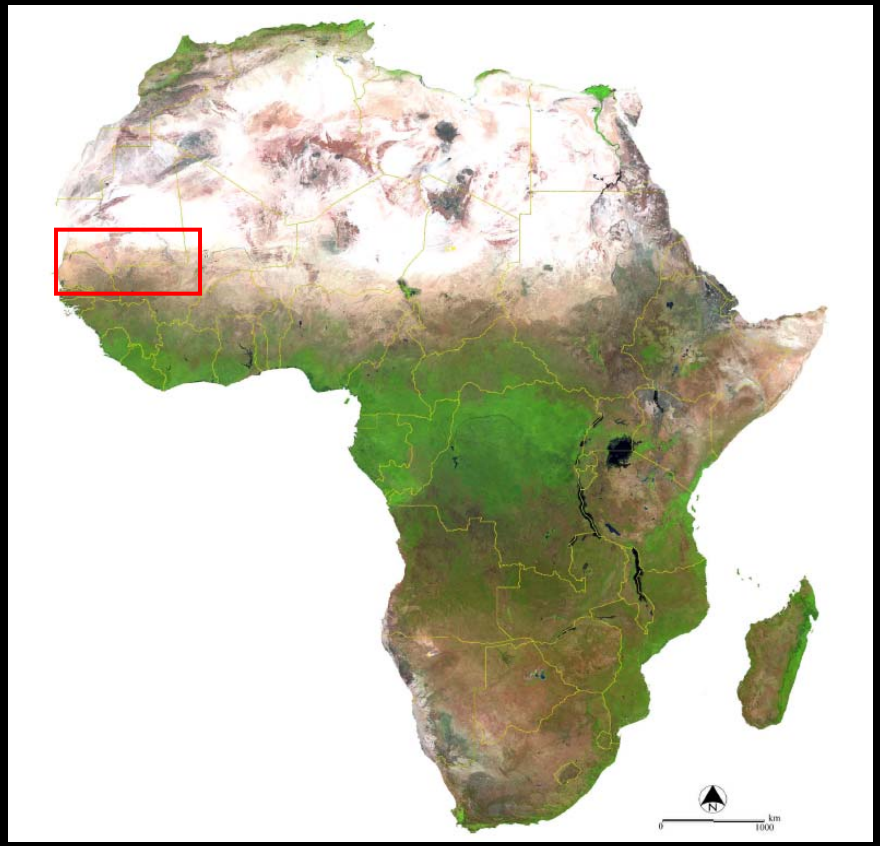
Inputs

- NDVI (Normalised Difference Vegetation Index) from SPOT – Vegetation sensor
- Maximum values for 36 dekads (10-day periods) across 2007
- Reduced to 4 principal components that summarise broad variation in vegetation productivity / photosynthesis over the year

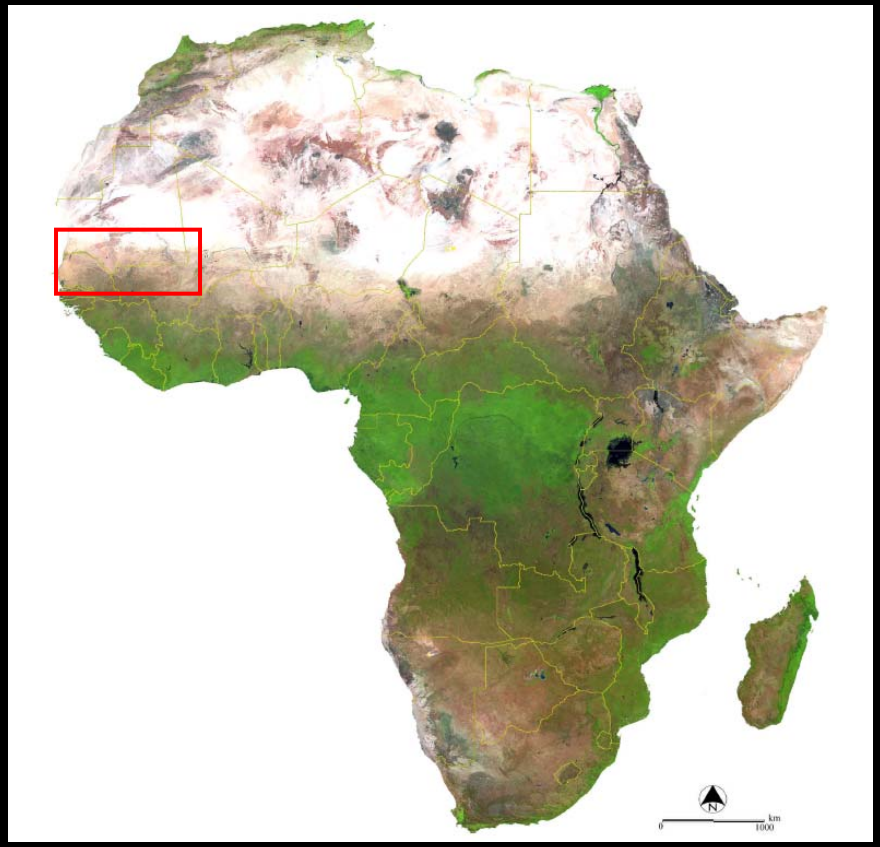


Two model approaches

- Presence only model
  - Maximum Entropy modelling
  - Nine occupied 1 km pixels
  - 10 000 pseudo absences



Two model approaches

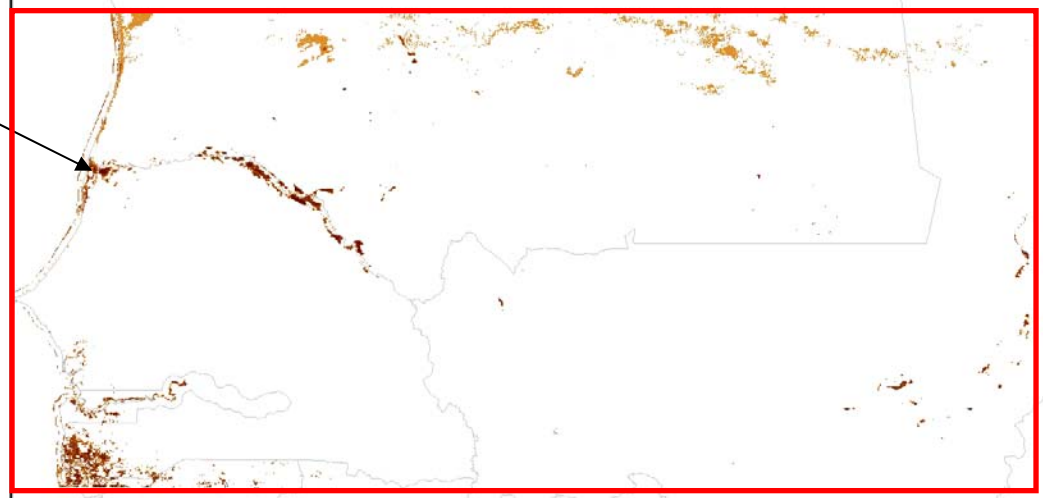


- Logistic regression
  - Presence and absence data from field surveys
  - Nine occupied 1 km pixels
  - 138 apparently unoccupied sites

Outputs – maximum entropy model (ROC/AUC = 0.98)

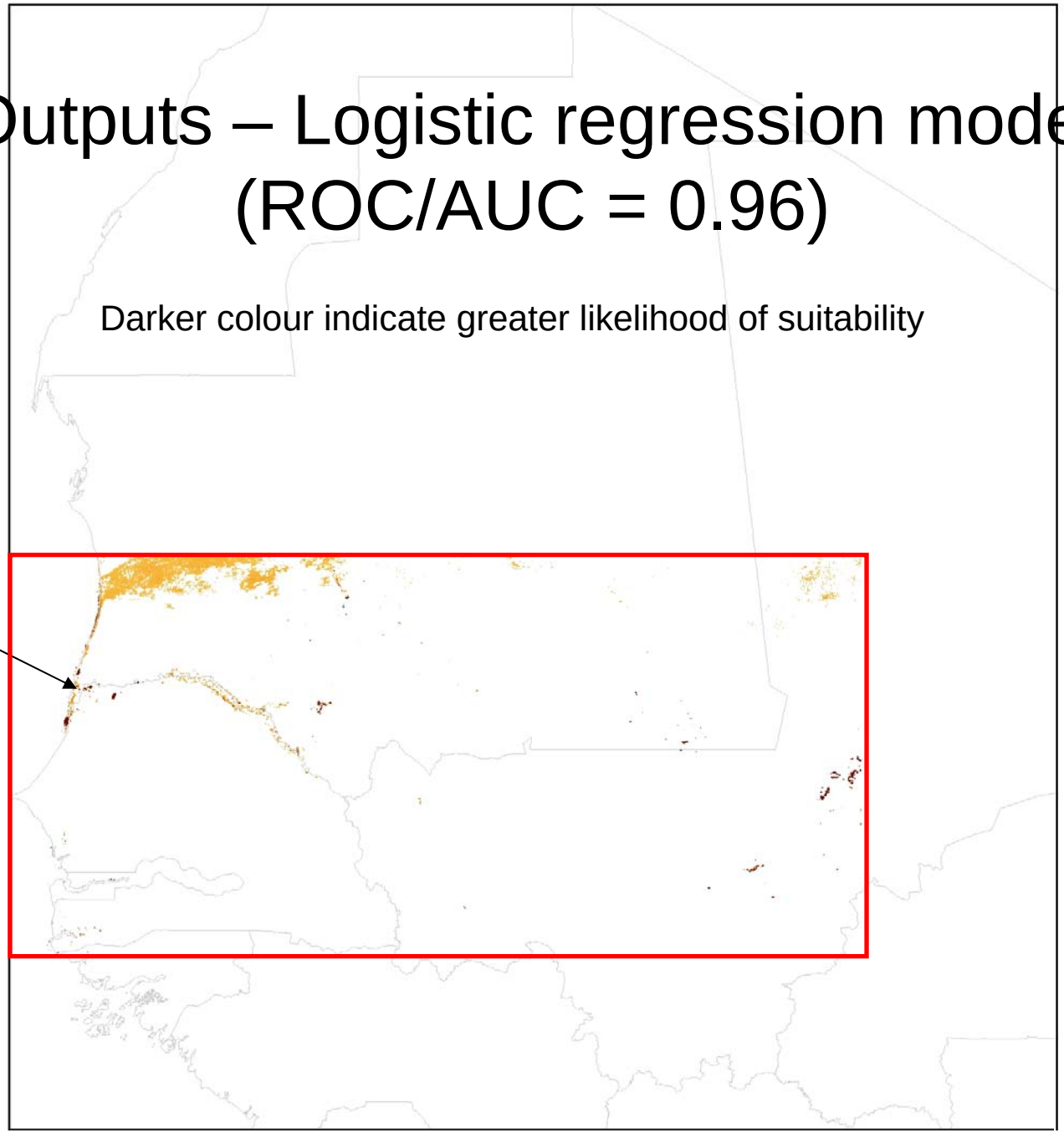
Darker colour indicate greater likelihood of suitability

Djoudj



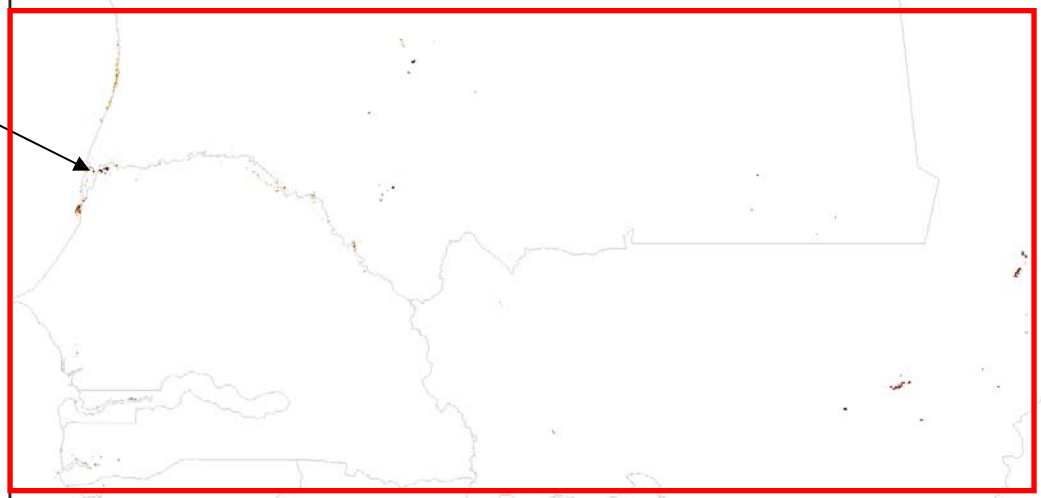
Outputs – Logistic regression model (ROC/AUC = 0.96)

Darker colour indicate greater likelihood of suitability

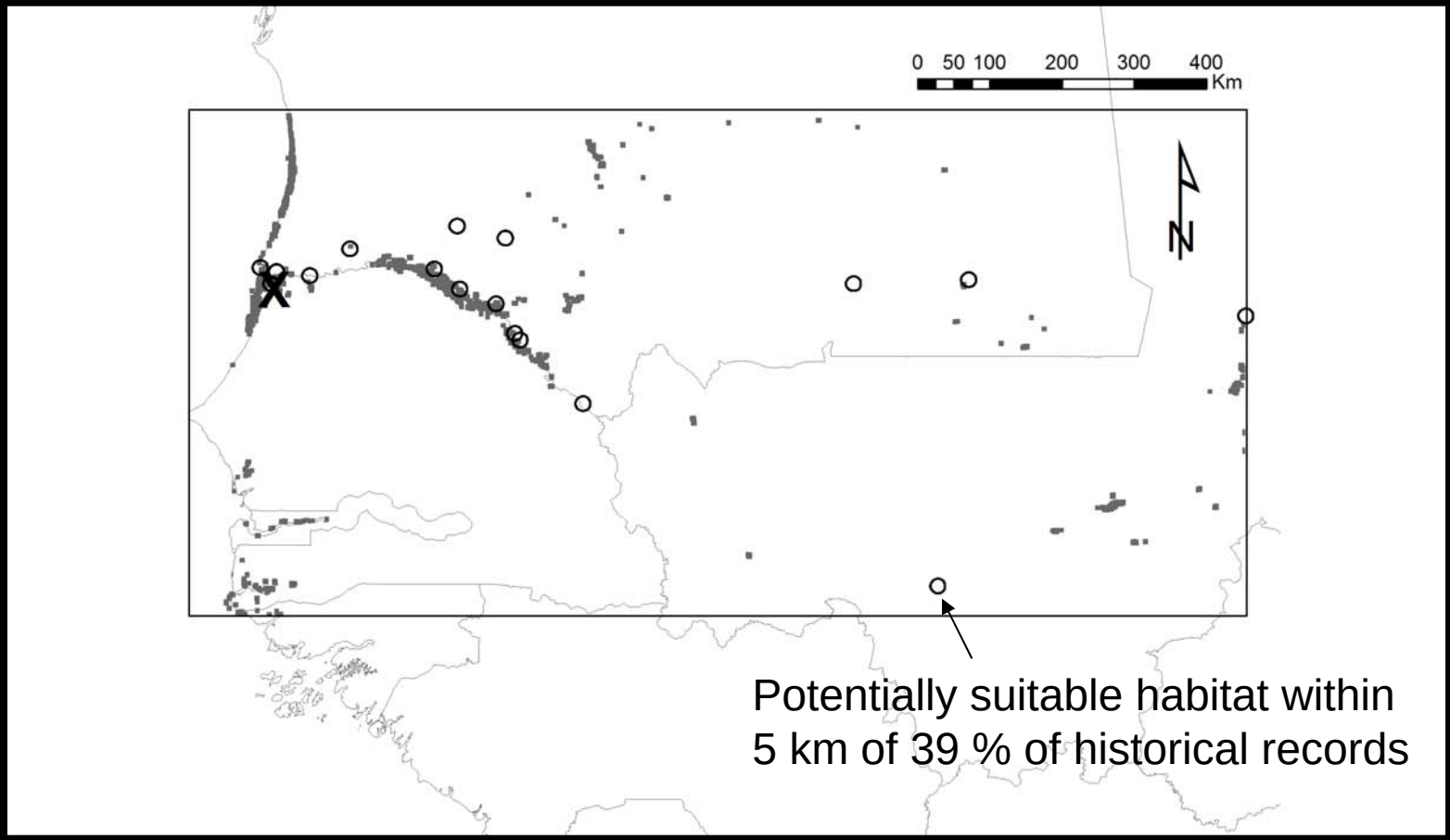


Combined outputs – potentially suitable habitat that be used in winter aquatic warblers

Darker colour indicate greater likelihood of suitability
(c.1000 km^2 'suitable')



Locations (enlarged to make them visible) and historical locations of records (open circles)



Further work

- Field surveys
  - surveys of potentially suitable and potentially unsuitable areas to assess model efficacy
- Models refined using new field data

Acknowledgements:
Aquatic warbler
Conservation Team