



condatis



Condatis Demos for FLOW & PRIORITISATION analyses

JENNY HODGSON
& KATH ALLEN

Activity

FLOW analysis 1

As the climate gets warmer, which routes will woodland populations take through the proposed Northern Forest region?

- Perform a **Flow** analysis
- Interpret the results

FLOW analysis 2

Which routes will heathland populations take to move from habitat patches in the south of England to those in the north? Where are the bottlenecks?

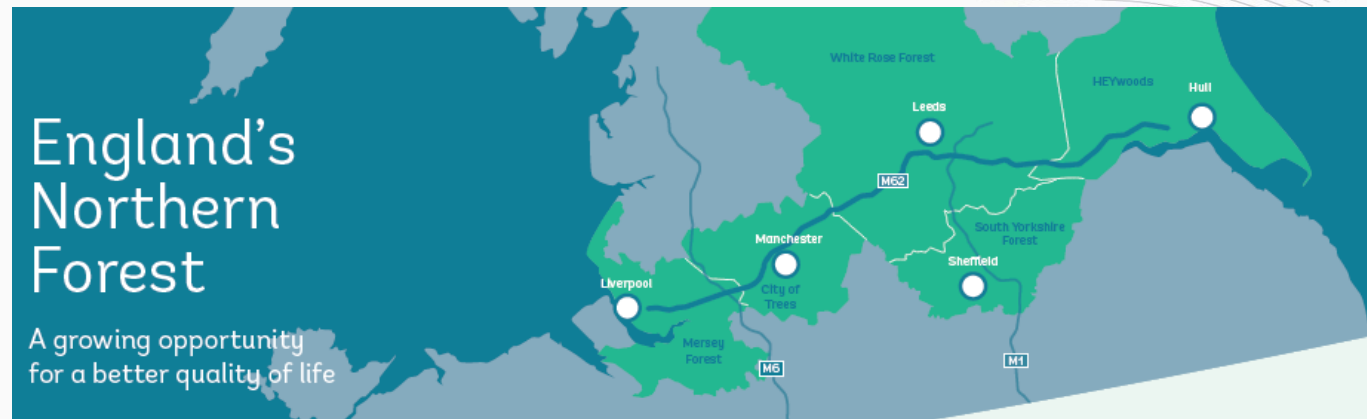
- Perform a **Flow** analysis including bottlenecks
- Interpret the results

PRIORITISATION analysis 3

Given plans to protect more of Sabah's forest, which currently unprotected forest habitats are a priority for long-term connectivity between lowland protected areas and Mount Kinabalu?

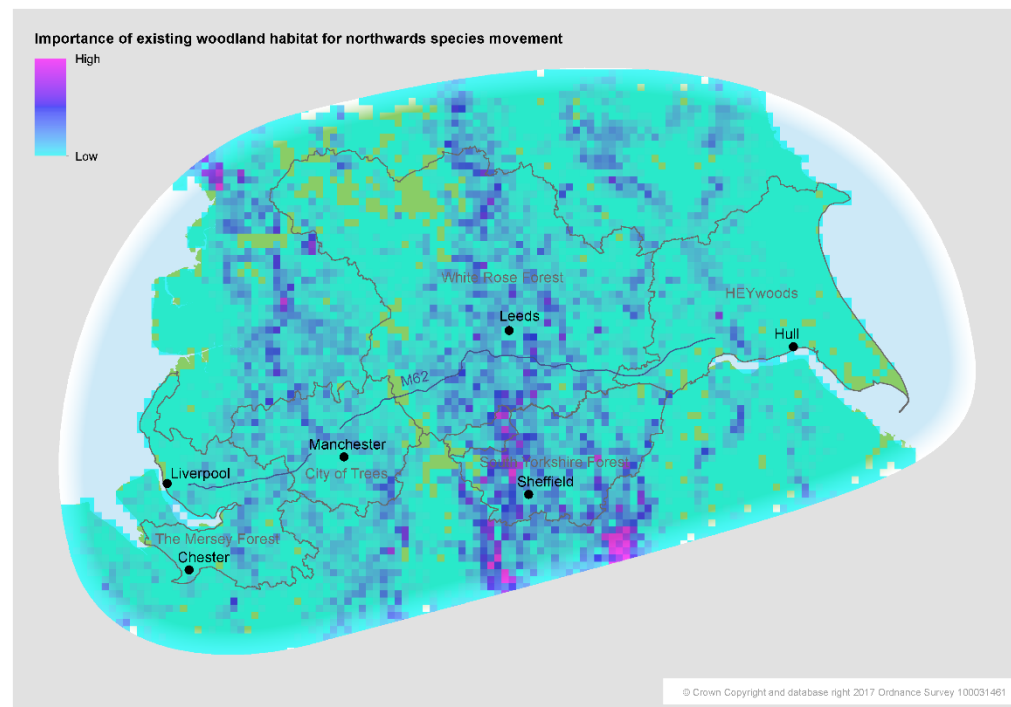
- Perform a **Prioritisation by Dropping** analysis
- Interpret the results

FLOW 1 – Creating a connected Northern Forest



Conservation & Management Q:

Which are the main routes for woodland species moving from south to north, through the proposed Northern Forest region?



Original analysis for the Northern forest region by Tom Butlin, Mersey Forest (then using deciduous and conifer woodlands)

Inputs for Condatis – FLOW 1 analysis

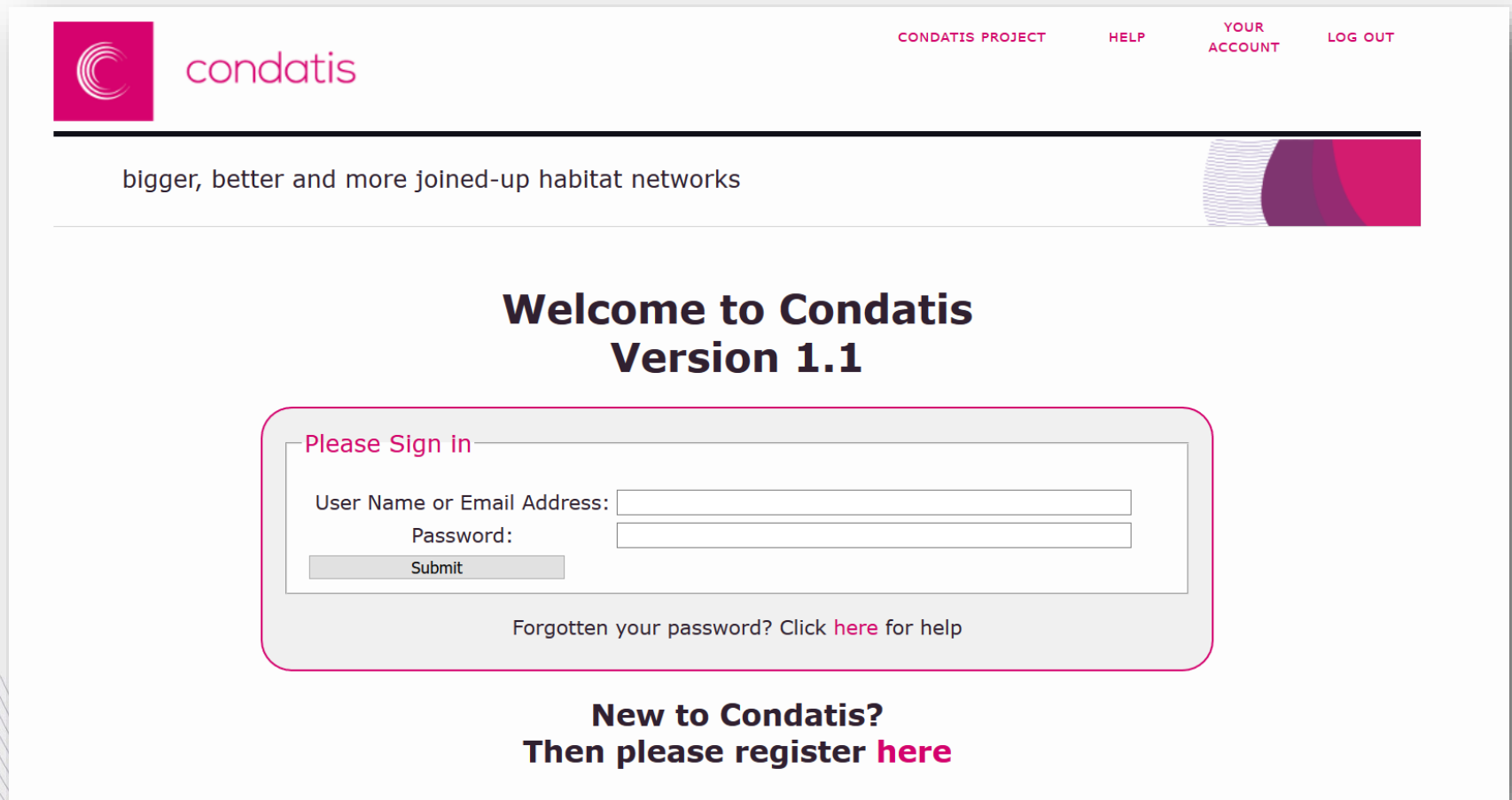
Data/files	Name
File package	Flow1 (folder)
Habitat layer	pdwoodaroundNforest1km.tif
Source/target layer	Auto south-north
Reproductive rate	1000 individuals per km ²
Dispersal distance	1km
Bottlenecks	No
Condatis “job” name	e.g. pdwoodaroundNforest1kmFlow



Look at your
input layer
in GIS
before
starting?

Running your analysis

1. Open Condatis webpage & sign in



The screenshot shows the Condatis web application interface. At the top left is the Condatis logo, consisting of a stylized 'C' icon and the word 'condatis'. To the right of the logo are navigation links: 'CONDATIS PROJECT', 'HELP', 'YOUR ACCOUNT', and 'LOG OUT'. Below the navigation bar is a horizontal line, followed by the tagline 'bigger, better and more joined-up habitat networks'. The main heading in the center reads 'Welcome to Condatis Version 1.1'. Below this is a sign-in form with the heading 'Please Sign in'. The form contains two input fields: 'User Name or Email Address:' and 'Password:'. A 'Submit' button is located below the password field. Below the form is a link: 'Forgotten your password? Click [here](#) for help'. At the bottom of the page, it says 'New to Condatis? Then please register [here](#)'.

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CONDATIS PROJECT HELP YOUR ACCOUNT LOG OUT

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Welcome to Condatis Version 1.1

Please Sign in

User Name or Email Address:

Password:

Submit

Forgotten your password? Click [here](#) for help

New to Condatis?
Then please register [here](#)

<https://webapp.condatis.org.uk/>

Running your analysis

2. Create New job



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CONDATIS PROJECT

HELP

YOUR ACCOUNT

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Job Management

Job title	Date Presented	Analysis Type	Status	Progress	Results	Details
SabahPA3Flow	2018-06-27	Flow only	COMPLETE	100%	View Report	View Job
SabahPA4Flow	2018-06-27	Flow only	COMPLETE	100%	View Report	View Job
SabahPA1Drop	2018-06-27	Dropping	FAILED	100%	Not available	View Job
SabahPA1Drop	2018-06-27	Dropping	FAILED	100%	Not available	View Job
SabahPA2Drop	2018-06-27	Dropping	FAILED	100%	Not available	View Job
SabahPA3Drop	2018-06-27	Dropping	COMPLETE	100%	View Report	View Job
SabahPA3Drop	2018-06-27	Dropping	FAILED	100%	Not available	View Job
SabahPA3Drop	2018-06-27	Dropping	COMPLETE	100%	View Report	View Job
SabahPA2Drop	2018-06-27	Dropping	FAILED	100%	Not available	View Job
SabahPA2Drop	2018-06-27	Dropping	COMPLETE	100%	View Report	View Job
SabahPA4Drop	2018-06-27	Dropping	COMPLETE	100%	View Report	View Job
SabahPA2FLOW	2018-07-12	Flow only	COMPLETE	100%	View Report	View Job
SabahPA2FLOW	2018-07-17	Flow only	COMPLETE	100%	View Report	View Job
SabahPA2Drop	2018-07-17	Dropping	COMPLETE	100%	View Report	View Job
SabahPA2Dropflowbased	2018-07-17	Dropping	COMPLETE	100%	View Report	View Job
SabahPA2Dropflowbased(2)	2018-09-05	Dropping	COMPLETE	100%	View Report	View Job

[View All](#)

[Create New job](#)

Running your analysis

3. Set parameters and upload files.

Create Job

Job Creation

Username: kaallen
Email: kaallen@liverpool.ac.uk
*Job Title:
*Reproductive Rate (R): 1000
*Dispersal Distance (km): 5
Compute Bottlenecks: ☐
Include Prioritisation: ☐
*Habitat Layer: No file selected
Auto Source and Target Layer: ☐
*Source and Target Layer: No file selected
Email on completion? ☐
*Required Fields

Create Job

Job Creation

Username: kaallen
Email: kaallen@liverpool.ac.uk
*Job Title:
*Reproductive Rate (R): 1000
*Dispersal Distance (km): 5
Compute Bottlenecks: ☐
Include Prioritisation: ☐
*Habitat Layer: No file selected
Auto Source and Target Layer: ☒
↓ N to S
→ W to E
↑ S to N
← E to W
Email on completion? ☐
*Required Fields

4. Submit job.

Running your analysis

5. Your position in the *Queue* will be shown



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HELP

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Job Management

Job title	Date Presented	Analysis Type	Status	Progress	Results	Details
SabahPA4Flow	2018-06-27	Flow only	COMPLETE	100%	View Report	View Job
SabahPA1Drop	2018-06-27	Dropping	FAILED	100%	Not available	View Job
SabahPA1Drop	2018-06-27	Dropping	FAILED	100%	Not available	View Job
SabahPA2Drop	2018-06-27	Dropping	FAILED	100%	Not available	View Job
SabahPA3Drop	2018-06-27	Dropping	COMPLETE	100%	View Report	View Job
SabahPA3Drop	2018-06-27	Dropping	FAILED	100%	Not available	View Job
SabahPA3Drop	2018-06-27	Dropping	COMPLETE	100%	View Report	View Job
SabahPA2Drop	2018-06-27	Dropping	FAILED	100%	Not available	View Job
SabahPA2Drop	2018-06-27	Dropping	COMPLETE	100%	View Report	View Job
SabahPA4Drop	2018-06-27	Dropping	COMPLETE	100%	View Report	View Job
SabahPA2FLOW	2018-07-12	Flow only	COMPLETE	100%	View Report	View Job
SabahPA2FLOW	2018-07-17	Flow only	COMPLETE	100%	View Report	View Job
SabahPA2Drop	2018-07-17	Dropping	COMPLETE	100%	View Report	View Job
SabahPA2Dropflowbased	2018-07-17	Dropping	COMPLETE	100%	View Report	View Job
SabahPA2Dropflowbased(2)	2018-09-05	Dropping	COMPLETE	100%	View Report	View Job
CalcEng2kmFlow	2018-09-05	Flow only	PREPARING Queue Pos: 1	0%	Not available	View Job

[View All](#)

[Create New job](#)

Running your analysis

5. A window will pop up, showing the key parameters of the Job; these can also be viewed by clicking on “View Job”

The screenshot displays the Condatis web application interface. At the top, the Condatis logo is on the left, and navigation links for 'CONDATIS PROJECT', 'HELP', 'YOUR ACCOUNT', and 'LOG OUT' are on the right. A 'Condatis Log' window is open, showing the following details:


- Time:** 2020-02-21 17:05:55
- Job Title:** pdwoodaroundNforest1kmFlow
- Log Type:** PREVIEW
- Message:**

Number of cells	16675
Source size (magenta)	520 cells
Target size (cyan)	520 cells
Estimated time	Approximately 2 minutes
East-West Range	304.100 - 556.100
North-South Range	372.000 - 500.000
Greatest cell coverage	80.25%
Average cell coverage	6.25%

To the right of the text in the log window is a map visualization showing a green area on a grey background, representing the spatial distribution of the job data. On the right side of the interface, a 'Details' section contains six 'View Job' buttons. At the bottom right, there are links for 'TERMS AND CONDITIONS', 'PRIVACY DECLARATION', and a copyright notice '© CONDATIS 2018'.

Running your analysis

6. Open Results html page

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CONDATIS PROJECT HELP YOUR ACCOUNT LOG OUT

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Job Management

Job title	Date Presented	Analysis Type	Status	Progress	Results	Details
Admintest	2019-01-14	Flow only	COMPLETE	100%	View Report	View Job
FlowAutoST	2020-02-17	Flow only	COMPLETE	100%	View Report	View Job
FlowBottle	2020-02-17	Flow only	COMPLETE	100%	View Report	View Job
Dropping	2020-02-17	Dropping	COMPLETE	100%	View Report	View Job
FlowAutoST(2)	2020-02-17	Flow only	COMPLETE	100%	View Report	View Job
FlowBottle(2)	2020-02-17	Flow only	COMPLETE	100%	View Report	View Job
pdwoodaroundNforest1kmFlow	2020-02-21	Flow only	COMPLETE	100%	View Report	View Job

[Create New job](#) [Admin Functions](#)

Running your analysis

6. Open Results html page

Condatis analysis results report for job: pdwoodaroundNforest1kmFlow Analysis Type: Flow Only

Name	kaallen
Email	kaallen@liverpool.ac.uk
Date presented	02/21/2020 17:05:44
Time taken for analysis	0:01:09

Input Data and parameters

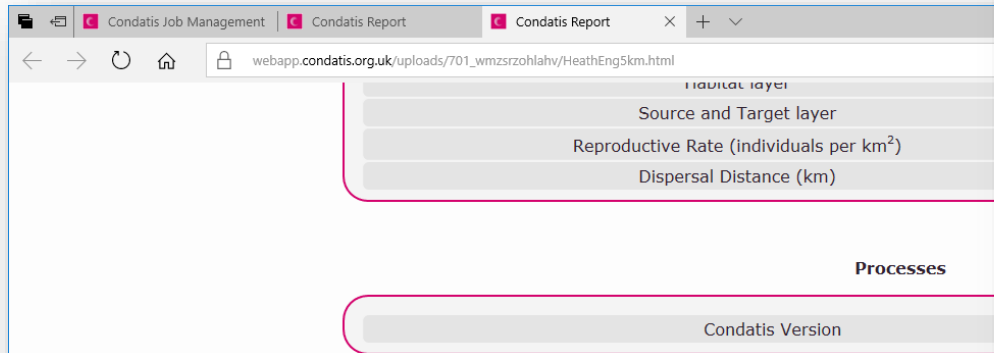
Habitat layer	pdwoodaroundNforest1km.tif
Source and Target layer	Auto Generated (SN)
Reproductive Rate (Individuals per km ²)	1000.0
Dispersal Distance (km)	1.0

Processes

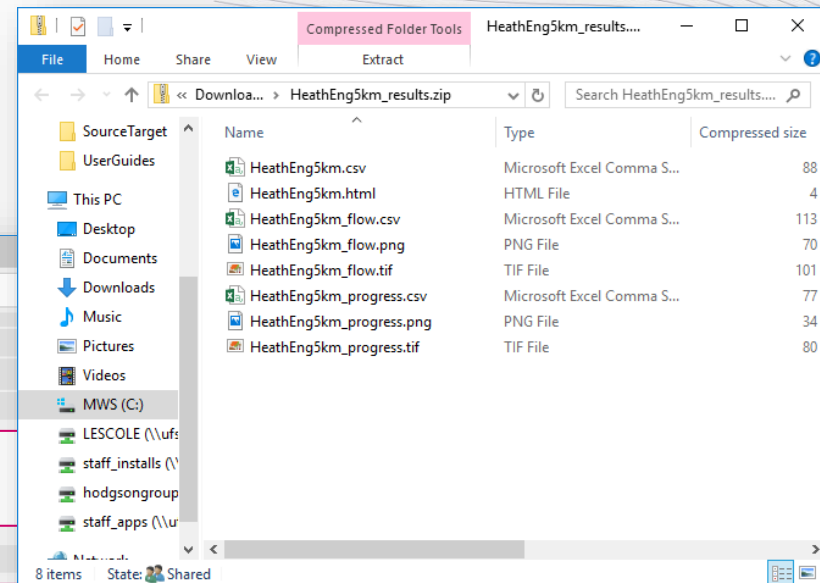
Condatis Version	1.10
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Running your analysis

7. Download zip file



The screenshot shows the Condatis web application interface. The browser address bar displays `webapp.condatis.org.uk/uploads/701_wmzsrzohlahv/HeathEng5km.html`. The main content area is divided into several sections: 'Habitat layer', 'Source and Target layer', 'Reproductive Rate (individuals per km²)', 'Dispersal Distance (km)', 'Processes', and 'Condatis Version'. The 'Processes' section is highlighted with a red box.



The screenshot shows a Windows File Explorer window titled 'HeathEng5km_results....'. The window displays the contents of the 'HeathEng5km_results.zip' file. The files listed are:

Name	Type	Compressed size
HeathEng5km.csv	Microsoft Excel Comma S...	88 K
HeathEng5km.html	HTML File	4 K
HeathEng5km_flow.csv	Microsoft Excel Comma S...	113 K
HeathEng5km_flow.png	PNG File	70 K
HeathEng5km_flow.tif	TIF File	101 K
HeathEng5km_progress.csv	Microsoft Excel Comma S...	77 K
HeathEng5km_progress.png	PNG File	34 K
HeathEng5km_progress.tif	TIF File	80 K

Results

Output files:

All files included in zip file [HeathEng5km_results.zip \(Click to download\)](#)

- HeathEng5km.csv
- HeathEng5km_flow.tif
- HeathEng5km_progress.tif

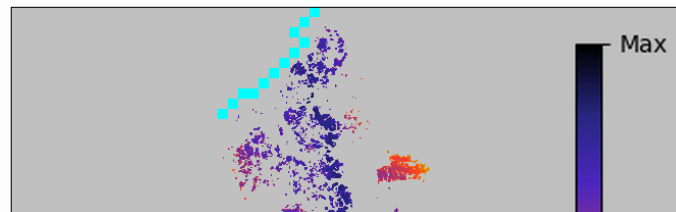
The *Help Documentation* on the Condatis website provides further information to assist with the interpretation of Condatis outputs and with troubleshooting, and can be accessed [here](#).

Maps shown in .tif files can be viewed using a mapping platform, for example [QGIS](#)(free and open source) or [ArcGIS](#).

Summary of results.

The overall speed of movement of the modelled species from source to target in this landscape is 6.056567e-06. The lower the speed, the longer the time it would take for the first colonisation of the target. The relationship between Condatis' speed and the rate of movement in population simulations is very significant, but not exact or linear (Hodgson *et al.*, 2012). If speed is < 1 it probably indicates that many generations would be needed for the species to reach the target. If the speed is > 1 it may indicate that there are many alternative routes which all have a possibility of leading to the first successful target colonisation.

Flow Map



CONNECTING UP THE NORTHERN FOREST–

Flow analysis recap

Which are the main routes for woodland species moving from south to north, through the proposed Northern Forest region?

1. Open Condatis webpage & sign in
2. Create new job
3. Decide on type of analysis, i.e. Flow only
4. Fill out data input boxes
5. Check job information
6. Open Results .html page
7. Download .zip file

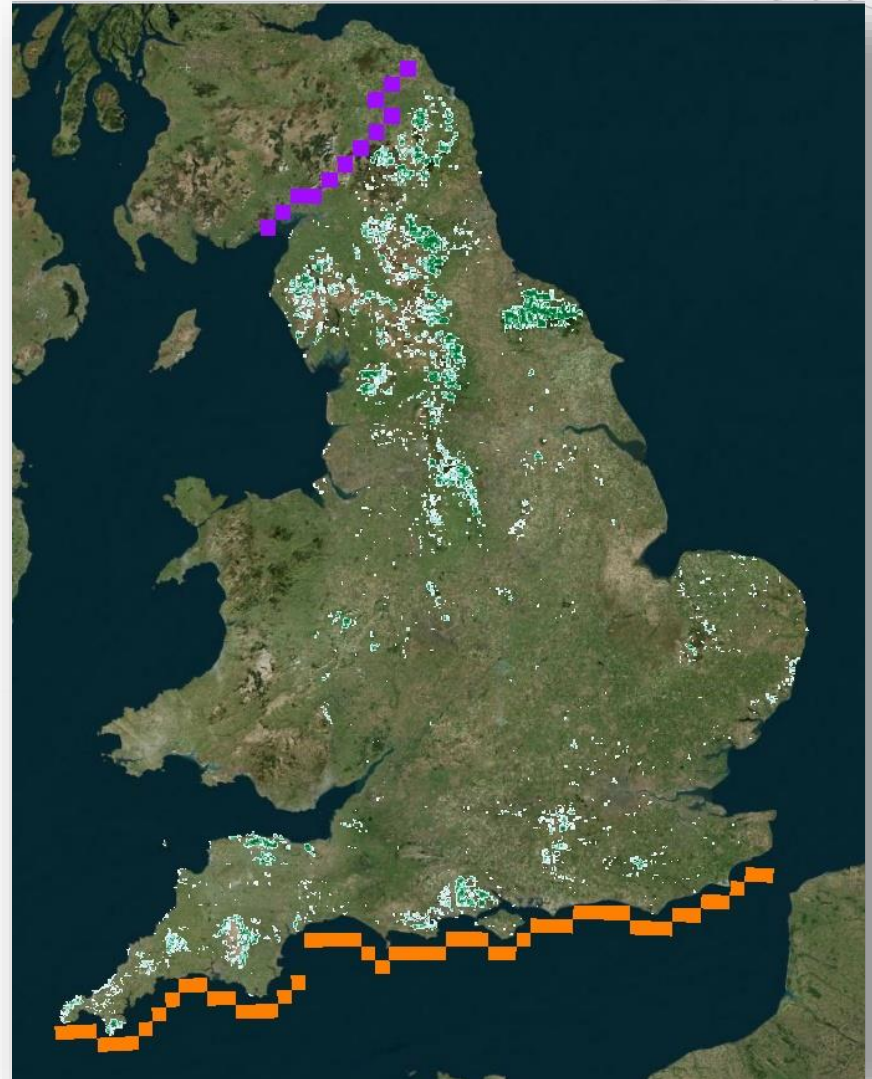
Data/files	Name
File package	Flow1 (folder)
Habitat layer	pdwoodaroundNforest1km.tif
Source/target layer	Auto south-north
Reproductive rate	1000 individuals per km ²
Dispersal distance	1km
Bottlenecks	No
Condatis “job” name	e.g. pdwoodaroundNforest1kmFlow

FLOW 2 – Connecting up heathland in England

Conservation & Management Qs:

*As the climate gets warmer, **which routes** could biodiversity of heathlands take to move from the south of England to the north?*

Where are the most serious bottlenecks (chokepoints) in northward movement located, which may constitute priority areas for habitat creation?



Heathland habitat across England, with *Source* and *Target* locations shown

Inputs for Condatis – FLOW 2 analysis

Data/files	Name
File package	Flow2 (folder)
Habitat layer	HeathEng1km.tif
Source/target layer	Eng_SN.tif
Reproductive rate	2000 individuals per km ²
Dispersal distance	5km / 10km
Bottlenecks	Yes
Condatis “job” name	<i>e.g. HeathEng5kmFlow</i>



Running your analysis

1. Follow steps 2-7 above, this time uploading a source-target layer and selecting bottlenecks.

Create Job

Job Creation

Username: kaallen
Email: kaallen@liverpool.ac.uk
*Job Title:
*Reproductive Rate (R): 1000
*Dispersal Distance (km): 5
Compute Bottlenecks: ☐
Include Prioritisation: ☐
*Habitat Layer: No file selected.
Auto Source and Target Layer: ☐
*Source and Target Layer: No file selected.
Email on completion? ☐
*Required Fields

Create Job

Job Creation

Username: kaallen
Email: kaallen@liverpool.ac.uk
*Job Title:
*Reproductive Rate (R): 1000
*Dispersal Distance (km): 5
Compute Bottlenecks: ☒
Number of Bottlenecks to Display: 50
Include Prioritisation: ☐
*Habitat Layer: No file selected.
Auto Source and Target Layer: ☐
*Source and Target Layer: No file selected.
Email on completion? ☐
*Required Fields

Changing dispersal



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Manage Job

Job Details

Username	
Email	
Job Title	
Reference Id	
Status	
Progress	
Presented	
Completed	No
Reproductive Rate	
Dispersal Distance	
Analysis Type	
Habitat Layer	
Source and Target Layer	
Prioritisation Layer	
Stages	
Stage Type	
Completion Notification	

8. Create Related job to run another dispersal distance while keeping everything else the same

View Logs Create Related Delete Job
Back to Manage Jobs

CONNECTING UP HEATHLAND IN ENGLAND

– Flow 2 analysis recap

As the climate gets warmer, which routes will populations of heathlands use to move from the south of England to the north?

1. Open Condatis webpage & sign in
2. Create new job
3. Decide on type of analysis, i.e. Flow only
4. Fill out data input boxes
5. Check job information
6. Open Results html page
7. Download zip file
8. Create related job –
repeat for other dispersal distance

Data/files	Name
File package	Flow2 (folder)
Habitat layer	HeathEng1km.tif
Source/target layer	Eng_SN.tif
Reproductive rate	2000 individuals per km ²
Dispersal distance	5km / 10km
Bottlenecks	Yes – <i>display 50</i>
Condatis “job” name	e.g. HeathEng5kmFlow

Interpreting results – Flow

Just in case you get an error message.....

The screenshot displays the Condatis web application interface. At the top, there's a browser address bar showing the URL: http://condatis.pgbfiles.co.uk/uploads/608_rmyinfewpyfh/CalcEng8kmFlow2.html. Below the browser tabs, the main content area is titled "Input Data and parameters".

Input Data and parameters	
Habitat layer	CalcEng1km.tif
Source and Target layer	Eng_SN.tif
Reproductive Rate (individuals per km ²)	2000.0
Dispersal Distance (km)	8.0

Below the input data, the "Results" section is displayed. It includes a heading "Output files:" followed by a list of files:

- i. CalcEng8kmFlow2.csv
- ii. CalcEng8kmFlow2_flow.tif
- iii. CalcEng8kmFlow2_progress.tif

A warning message is shown in red text: "Warning: Voltages detected both above bounds and have been clipped. We suggest increasing the dispersal value".

The "Summary of results." section provides a detailed explanation of the overall speed of movement of the modelled species from source to target in this landscape, which is 0.00. It explains that the lower the speed, the longer the time it would take for the first colonisation of the target. The relationship between Condatis' speed and the rate of movement in population simulations is very significant, but not exact or linear (Hodgson *et al.*, 2012). If speed is $<<1$ it probably indicates that many generations would be needed for the species to reach the target. If the speed is $>>1$ it may indicate that there are many alternative routes which all have a possibility of leading to the first successful target colonisation.

At the bottom, the "Flow Map" is shown. It features a map with a grey background and a blue line representing the flow path. A vertical color bar on the right side of the map is labeled "Max".

Interpreting results – Flow 1

Summary of results.

The overall speed of movement of the modelled species from source to target in this landscape is 0.2842. The lower the speed, the longer the time it would take for the first colonisation of the target. The relationship between *Condatis'* speed and the rate of movement in population simulations is very significant, but not exact or linear (Hodgson *et al.*, 2012). If speed is $\ll 1$ it probably indicates that many generations would be needed for the species to reach the target. If the speed is $\gg 1$ it may indicate that there are many alternative routes which all have a possibility of leading to the first successful target colonisation.

Flow Map

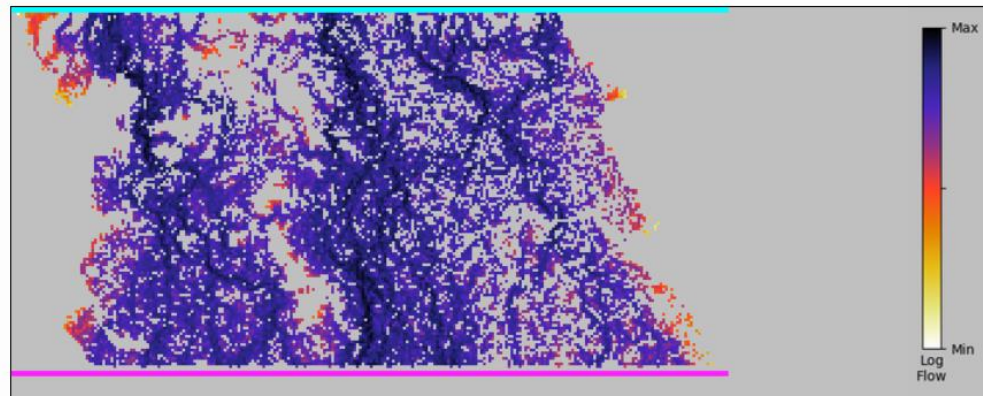


Fig. 1: The pattern of flow of individuals from source to target across the landscape. Flow through each cell is represented by the colour ramp, (note log scale). The source and target are labelled using MAGENTA and CYAN respectively. Cells that do not contain habitat are grey.

SPEED OF MOVEMENT

Which routes are the modelled population using to move through this landscape?

Are there many alternative routes or one dominant one?

Does this habitat seem relatively well connected?

Interpreting results – Flow 1

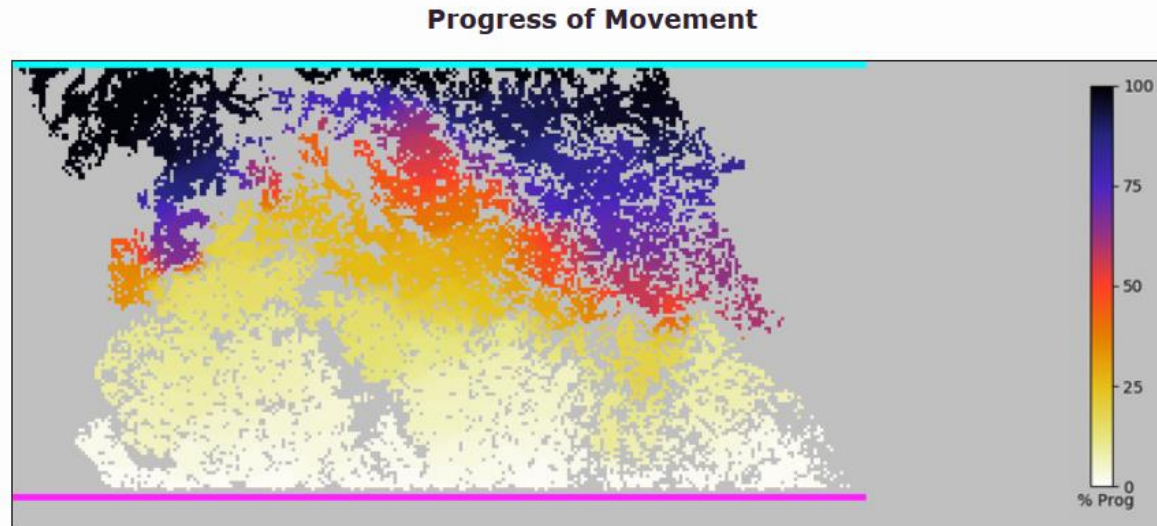


Fig. 2: The progress of movement from source to target is illustrated by the colour ramp. Bands of similar colour lie at a similar effective distance between the source and the target, e.g. a value of 50%, as demonstrated in the legend, represents the cells the species is expected to reach within half of the total 'travel' time. The source and target are labelled using **MAGENTA** and **CYAN** respectively.

PROGRESS OF MOVEMENT

Are there regions of “slow progress” in the landscape or is speed of movement relatively uniform across it?

Interpreting results – Flow 2

Summary of results.

The overall speed of movement of the modelled species from source to target in this landscape is 6.056567×10^{-6} . The lower the speed, the longer the time it would take for the first colonisation of the target. The relationship between Conductance and the rate of movement in population simulations is very significant, but not exact or linear (Hodgson *et al.*, 2012). If speed is < 1 it probably indicates that many generations would be needed for the species to reach the target. If the speed is > 1 it may indicate that there are many alternative routes which all have a possibility of leading to the first successful target colonisation.

Flow Map

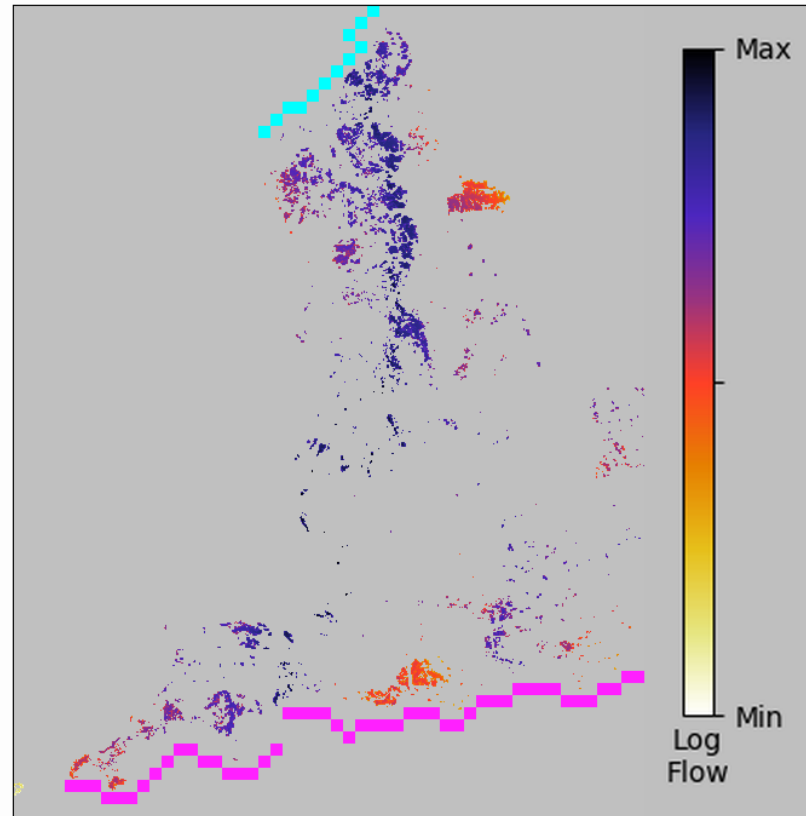


Fig. 1: The pattern of flow of individuals from source to target across the landscape. Flow through each cell is represented by the colour ramp, (note log scale). The source and target are labelled using MAGENTA and CYAN respectively. Cells that do not contain habitat are grey.

Dispersal distance = 5km

SPEED OF MOVEMENT

Which routes are the modelled population using to move through this landscape?

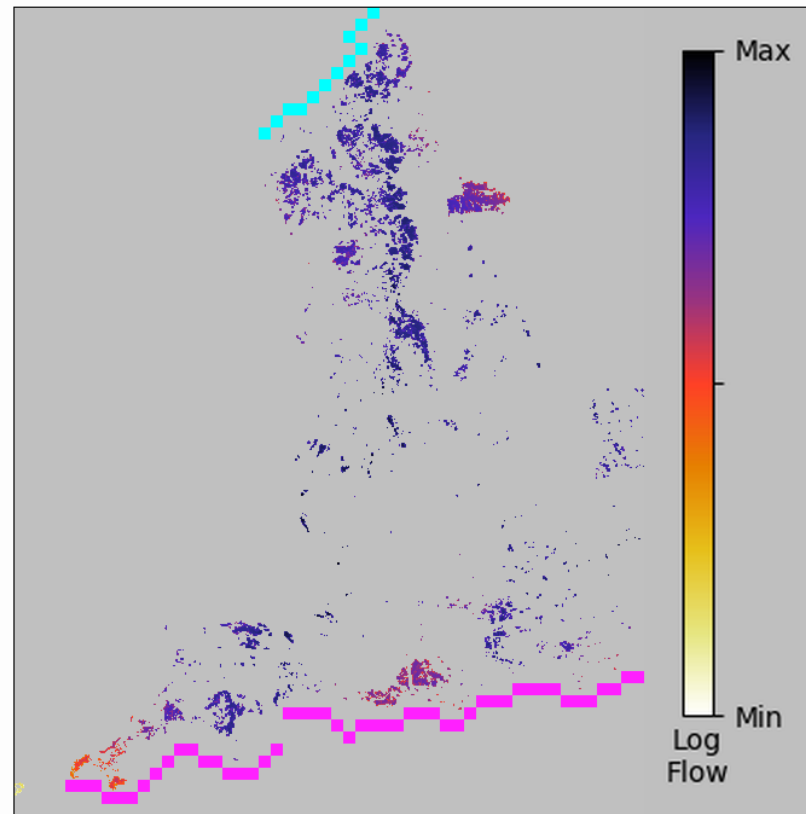
How quickly is the species of interest moving between the southern source and northern target?

Interpreting results – Flow 2

Summary of results.

The overall speed of movement of the modelled species from source to target in this landscape is 0.0027. The lower the speed, the longer the time it would take for the first colonisation of the target. The relationship between Condatis' speed and the rate of movement in population simulations is very significant, but not exact or linear (Hodgson *et al.*, 2012). If speed is $\ll 1$ it probably indicates that many generations would be needed for the species to reach the target. If the speed is $\gg 1$ it may indicate that there are many alternative routes which all have a possibility of leading to the first successful target colonisation.

Flow Map



Dispersal distance = 10km

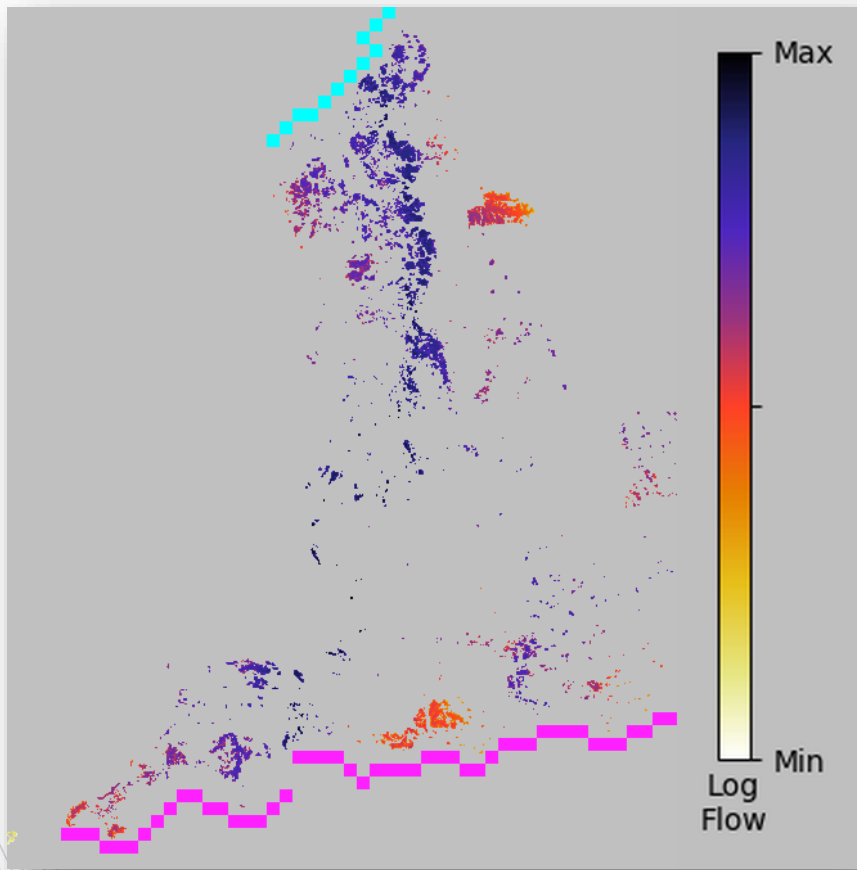
SPEED OF MOVEMENT

Which routes are the modelled population using to move through this landscape?

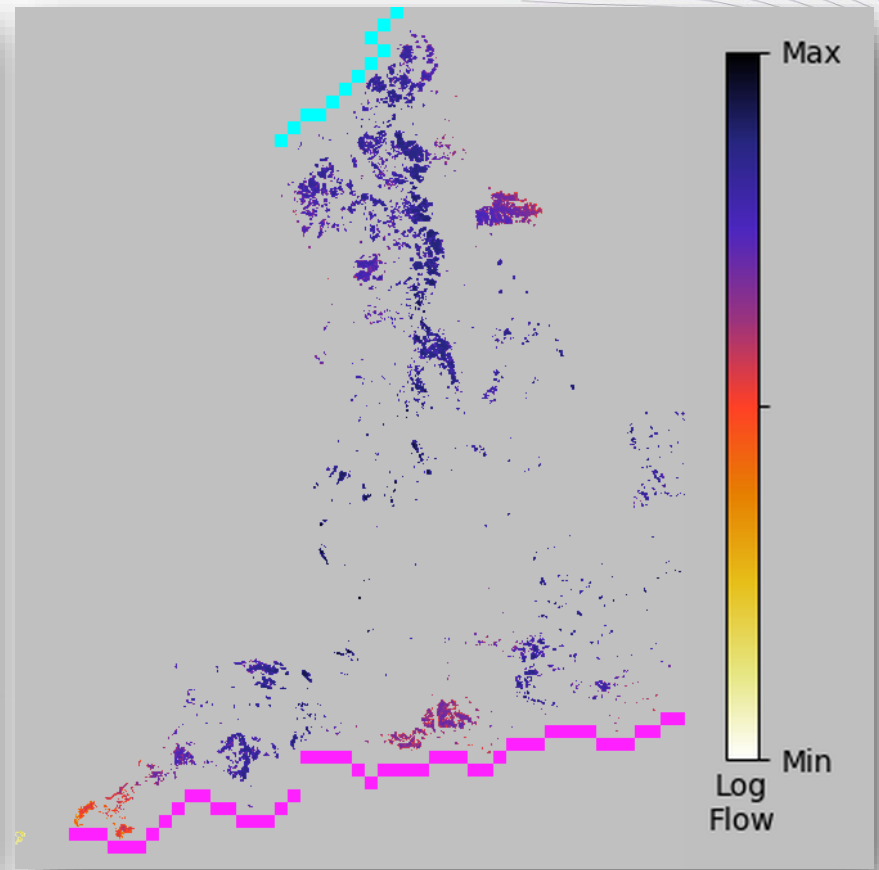
How quickly is the species of interest moving between the southern source and northern target?

Fig. 1: The pattern of flow of individuals from source to target across the landscape. Flow through each cell is represented by the colour ramp, (note log scale). The source and target are labelled using **MAGENTA** and **CYAN** respectively. Cells that do not contain habitat are grey.

Interpreting results – *Flow 2*



Dispersal distance = 5km



Dispersal distance = 10km

FLOW

Are there differences in the flow of populations across this landscape? Why?

Interpreting results – Flow 2

Bottlenecks (5km dispersal)

Where are the chokepoints in northward movement, which may constitute priority areas for habitat creation?

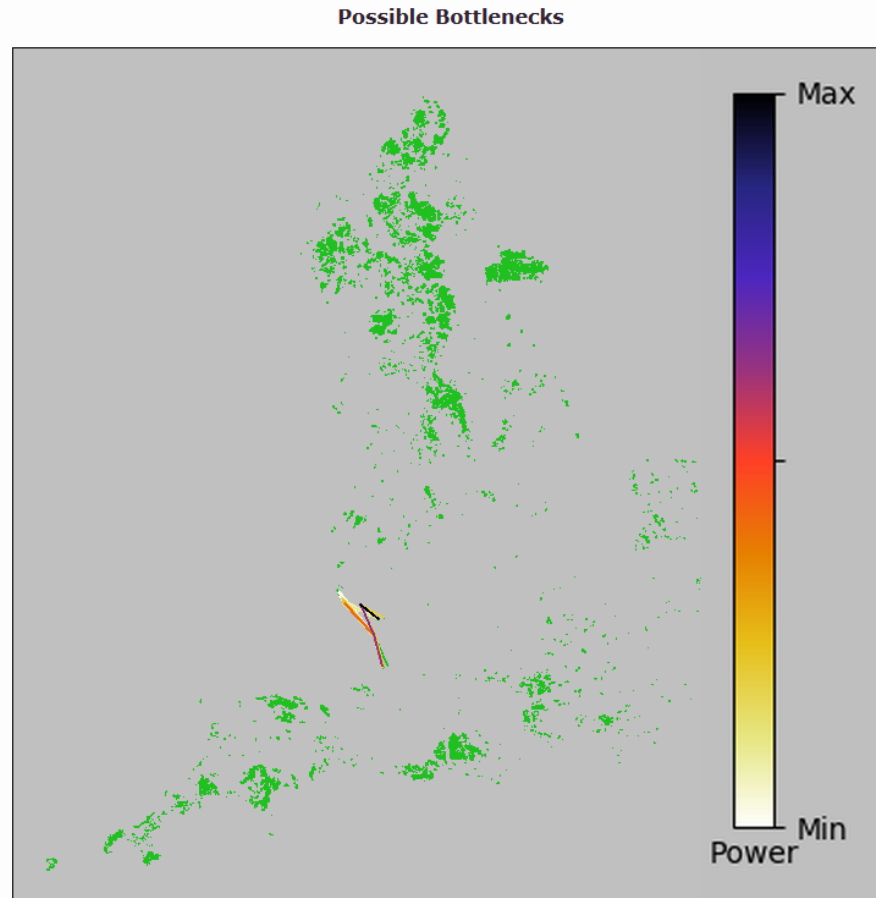
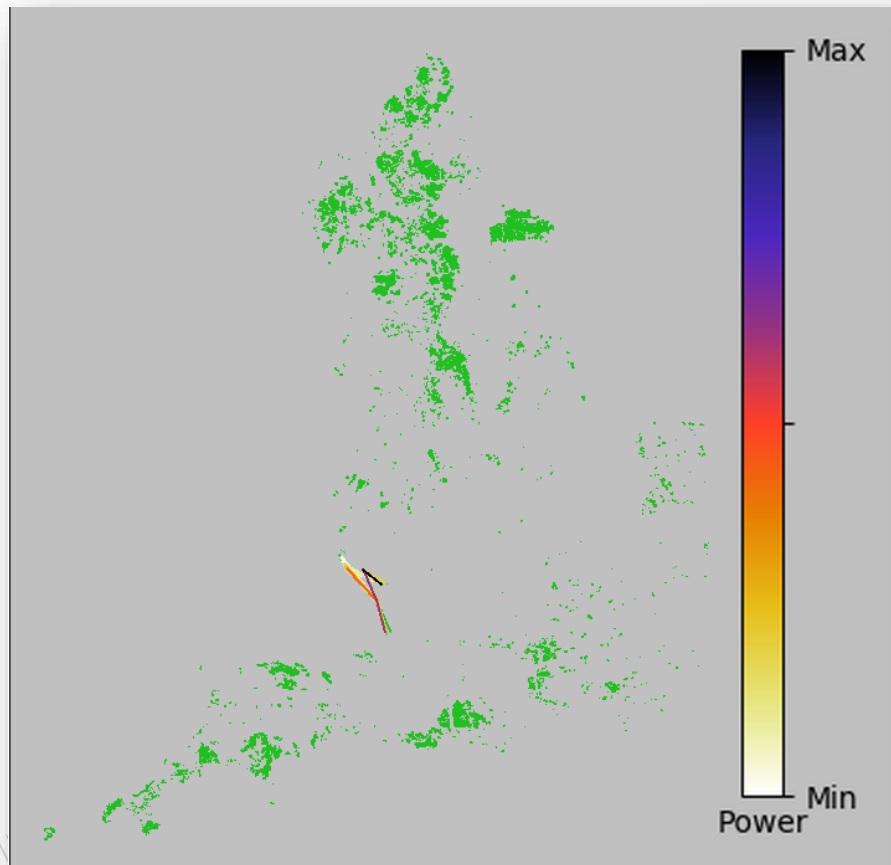
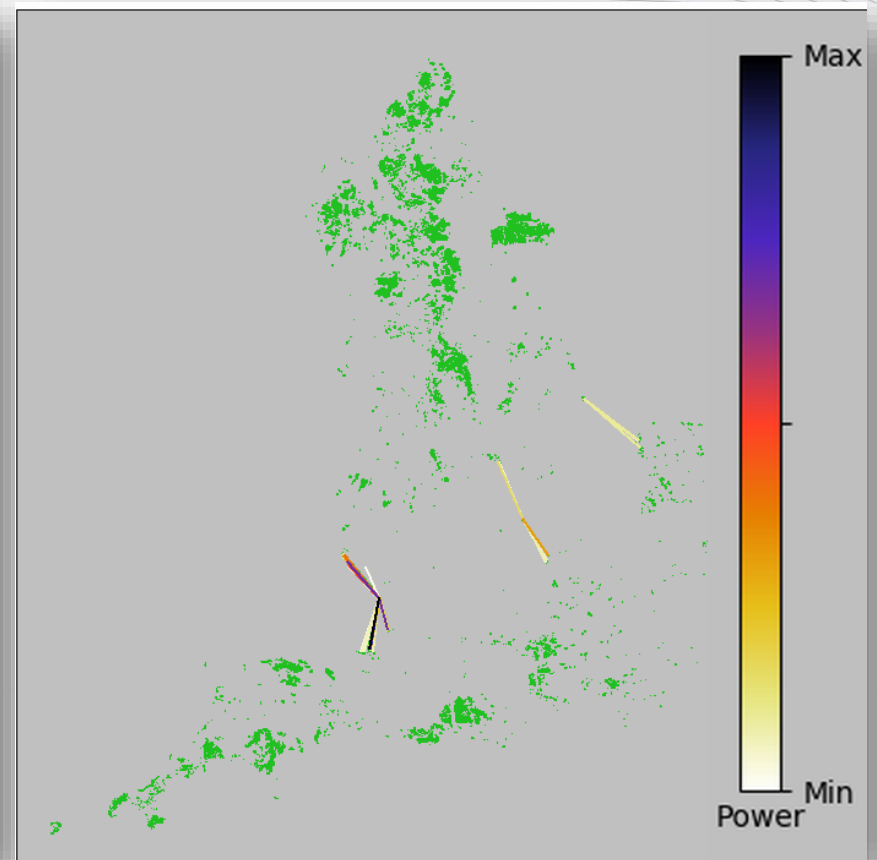


Fig. 3: Shows the links with the highest power. Power can be thought of as the "strain" placed on that link relative to the rest of the circuit. This plot shows the top 50 links as requested. Consult **HeathEng5km_bottlenecks.csv** or view the shapefile **HeathEng5km_bottlenecks.shp** for actual power values. The habitat layer is in green for reference.

Interpreting results – Flow 2



Dispersal distance = 5km



Dispersal distance = 10km

Bottlenecks

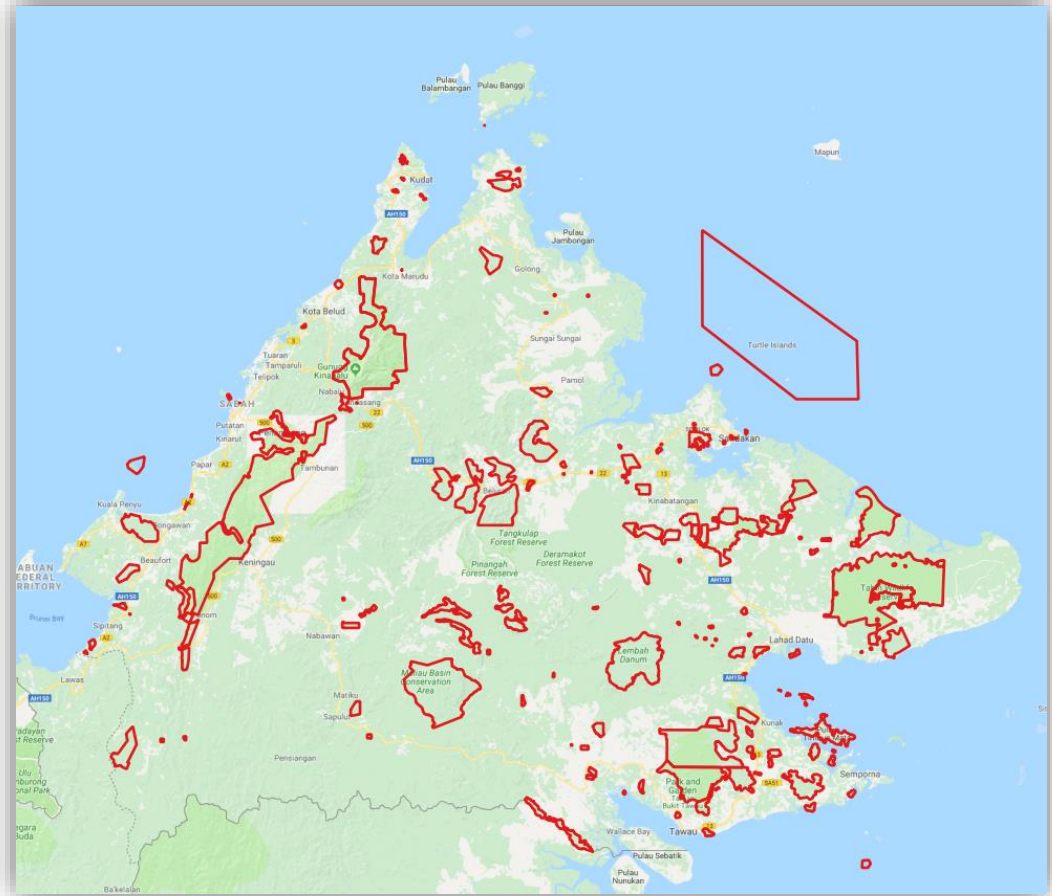
Are there differences in the bottlenecks across this landscape with different dispersal distances? Why?

Prioritisation - Enhancing Sabah's PA Network

Conservation & Management Qs:

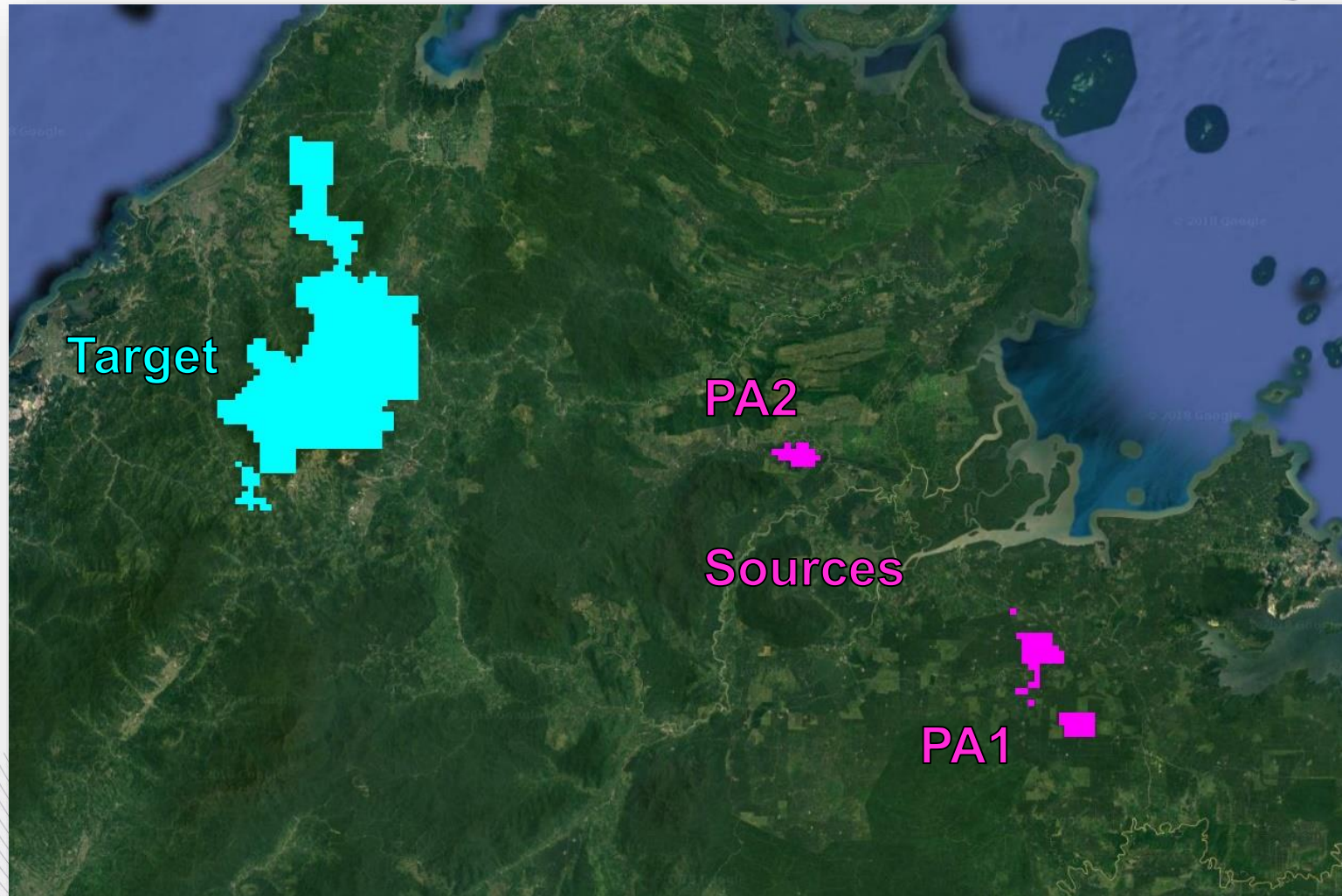
*As the climate gets hotter, **which forested routes** will populations take to move from lowland Protected Areas to suitable habitats on Mount Kinabalu?*

*Given plans to protect more of Sabah's forest, which are the currently unprotected forest habitats that are a **priority** for long-term connectivity between lowland PAs and Mount Kinabalu?*



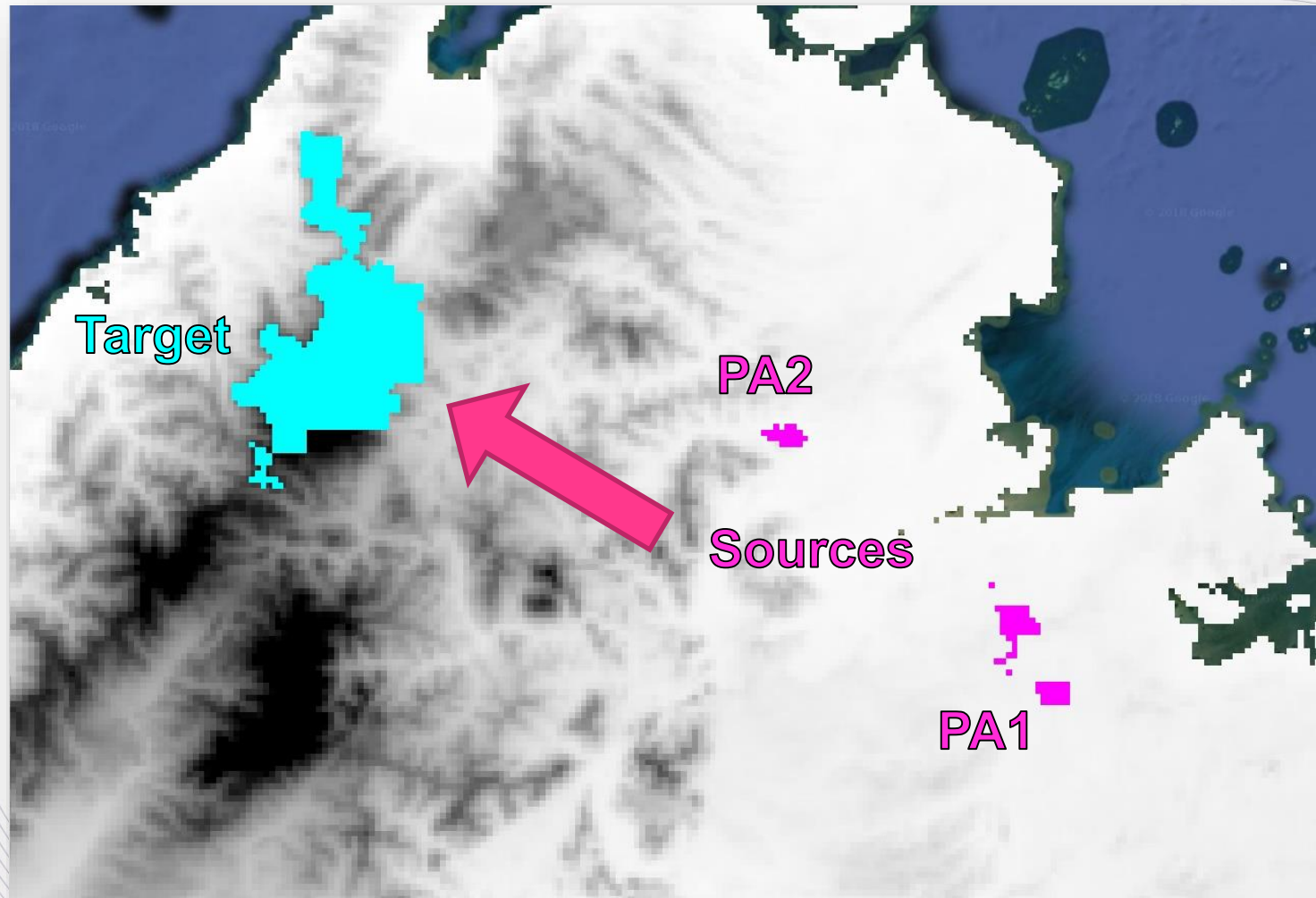
Sabah's Protected Areas

Case study Protected Areas



Lowland *sources* to highland *target*

....Direction of movement



Annual mean temperature
Species' ranges will shift towards cooler areas

....Habitat – mostly unprotected



Forest cover (Gaveau et al., 2016)
Species will move through forest habitat

Inputs for Condatis – *Prioritisation* analysis

Data/files	Name
File package	Prioritisation (folder)
Source/target layer	SourceTarget1.tif or SourceTarget2.tif
Habitat layer	Forestundrop.tif
Prioritisation layer	Forestdrop.tif
Reproductive rate	2000 individuals per km ²
Dispersal distance	4km
Bottlenecks	No
Number of stages for dropping	10 (rough guide)
Dropping stage Type	Number based
Condatis “job” name	e.g. SabahPA1Prioritise

Prioritisation analysis

Fill out data input boxes & run analysis

Create Job

Job Creation

Username:

Email:

*Job Title:

*Reproductive Rate (R):

*Dispersal Distance (km):

Compute Bottlenecks:☐

Include Prioritisation:☒

*Habitat Layer: No file selected.

Auto Source and Target Layer:☐

*Source and Target Layer: No file selected.

*Prioritisation Layer: No file selected.

Stages:

Stage Type:

Email on completion?☐

?

?

?

?

?

?

?

?

Consider:

(i) Number of stages of dropping

(ii) Flow OR Number based dropping

*Required Fields

Prioritisation analysis

Open Results html page & download zip files

Condatis analysis results report.

Job: SabahPA2Drop

Analysis Type: Dropping

Name	kaallen
Email	kaallen@liverpool.ac.uk
Date presented	02/21/2020 18:29:20
Time taken for analysis	0:03:25

Input Data and parameters

Habitat layer	Forestundrop.tif
Source and Target layer	SourceTarget2.tif
Prioritisation Layer	Forestdrop.tif
Reproductive Rate (individuals per km ²)	2000.0
Dispersal Distance (km)	4.0

Processes

Condatis Version	1.10
Dropping Steps	10
Step type	Cell_Number

Results

Output files:

All files included in zip file [SabahPA2Drop_results.zip \(Click to download\)](#)

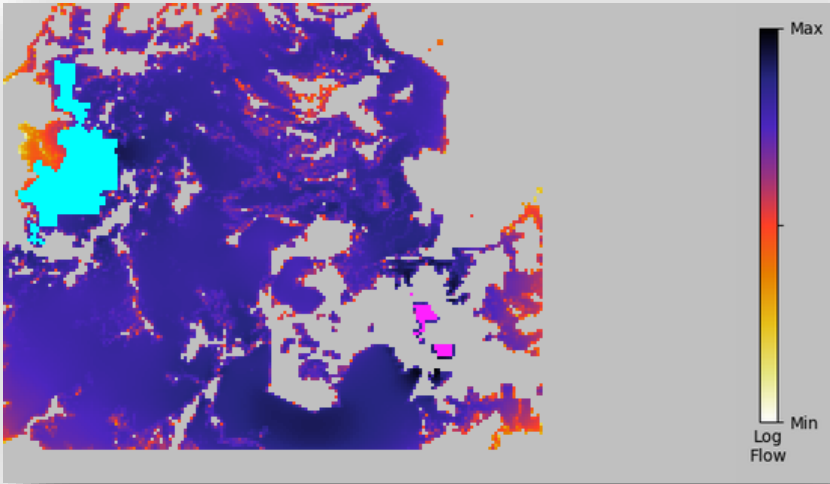
The zip file includes:



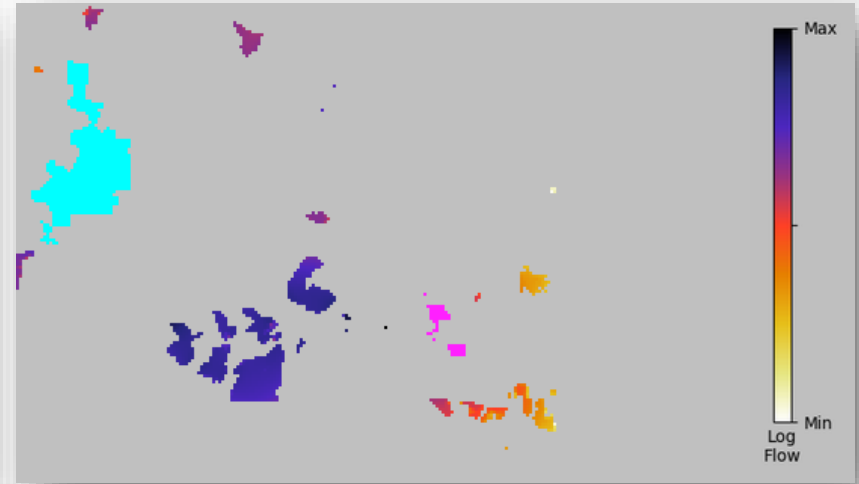
Prioritisation analysis

11. Check “job” has worked by viewing html report

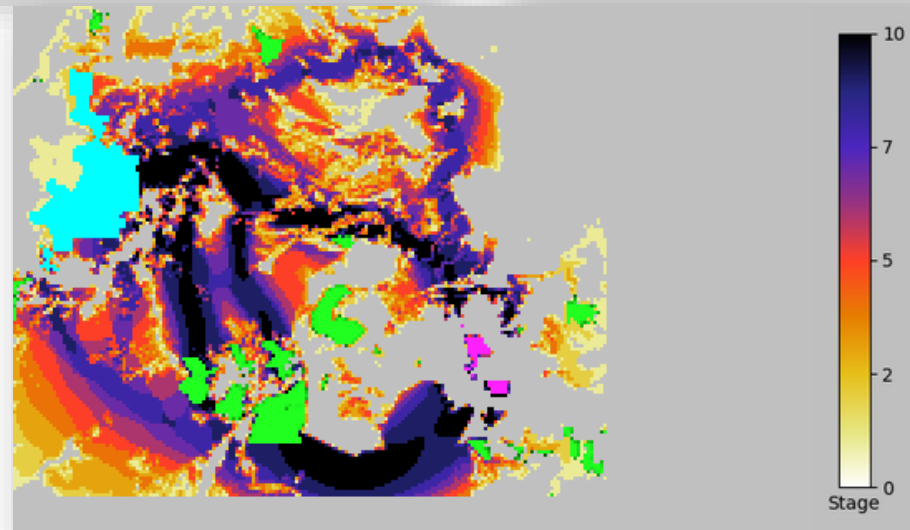
PA1



Start flow



End flow



Dropping rank

SABAH PROTECTED AREAS –

Prioritisation analysis recap

Which currently unprotected forest habitats that are a priority for long-term connectivity between lowland PAs and Mount Kinabalu?

1. Open Condatis webpage & sign in
2. Create new job
3. Decide on type of analysis, i.e. *Include prioritisation*
4. Fill out data input boxes
5. Check job information
6. Open Results html page
7. Download zip file
8. Create related job –
repeat for other source PA

Data/files	Name
File package	Prioritisation (folder)
Source/target layer	SourceTarget1.tif or SourceTarget2.tif
Habitat layer	Forestundrop.tif
Prioritisation layer	Forestdrop.tif
Reproductive rate	2000 individuals per km ²
Dispersal distance	4km
Bottlenecks	No
Number of stages for dropping	10 (rough guide)
Dropping stage Type	Number based
Condatis “job” name	e.g. SabahPA1Prioritise

Interpreting results – *Prioritisation*

Summary of results.

For this landscape of interest, the speed of movement of the modelled species changes from 444.7793 before any habitat is dropped to 0.0000 once all 15569 additional habitat cells are lost. This represents a reduction in speed of 100.0000% with a loss of habitat of 15569 km² (93.52% of the total habitat area).

Trajectory of dropping

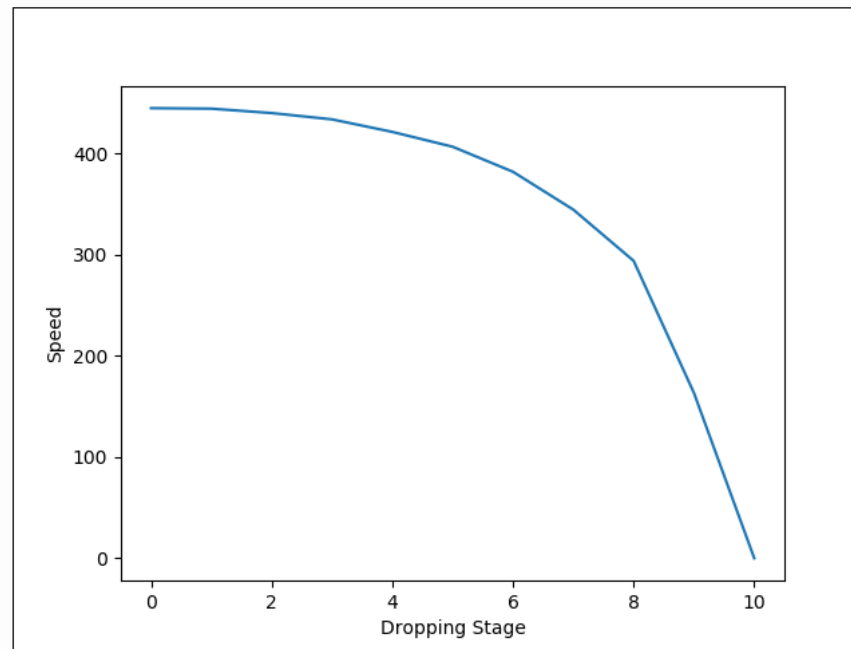


Fig. 1: The speed, (inversely related to the time taken to cross from source to target), is plotted against the stage of dropping. Here the dropping mode is **Number based**. (The dropping of habitat cells from the Prioritisation layer is performed such that an equal amount of cells are dropped per stage). Speed is expected to get slower when habitat is lost from the landscape, but notice how severely speed is lost at different stages.

What impact does loss of habitat, i.e. dropping, have on speed of movement?

How does speed change with each stage of dropping?

Interpreting results – Prioritisation

Which cells, when lost, cause the greatest reduction in speed?

BACKGROUND RESULTS

Additional figures that enable further interrogation of wildlife movement in the landscape.

Loss of Speed

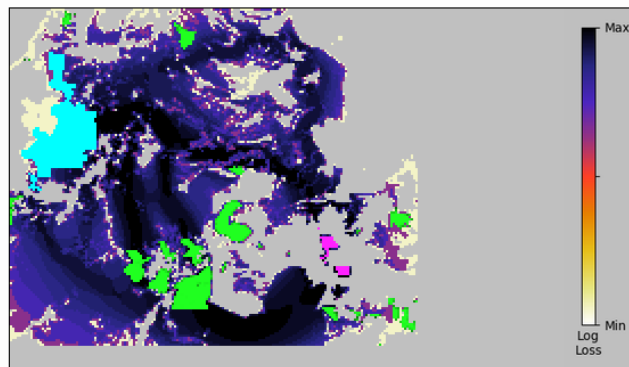


Fig. 3: The reduction in the speed of movement of the species from source to target with each stage of dropping is illustrated by the colour ramp, (note log scale). The source and target are labelled using **MAGENTA** and **CYAN** respectively. Non-droppable habitat cells are coloured **GREEN**. This is a spatial representation of the values in column 5 of Table 1, Reduction per cell. Higher values mean that the loss of these cells was highly detrimental to the total speed achievable in the landscape, and it implies these cells are of higher priority for connectivity.

Step Dropping Summary

Stage	Dropped	Speed	Speed Reduction	Reduction per Cell
Initial	0	444.779268	0.000000	0.000000
1	1557	444.283717	0.495551	0.000318
2	1557	439.916432	4.367285	0.002805
3	1557	433.701748	6.214684	0.003991
4	1557	421.301069	12.400679	0.007964
5	1557	406.642873	14.658197	0.009414
6	1557	381.891774	24.751098	0.015897
7	1557	344.490884	37.400891	0.024021
8	1557	293.879650	50.611234	0.032506
9	1557	163.357971	130.521679	0.083829
Final	1556	1.162501e-05	1.633580e+02	

Table 1: Summary of results from Condatis dropping analysis, showing the effect of dropping cells at each stage.

Interpreting results – *Prioritisation*

Which are the most important additional habitat cells to conserve?

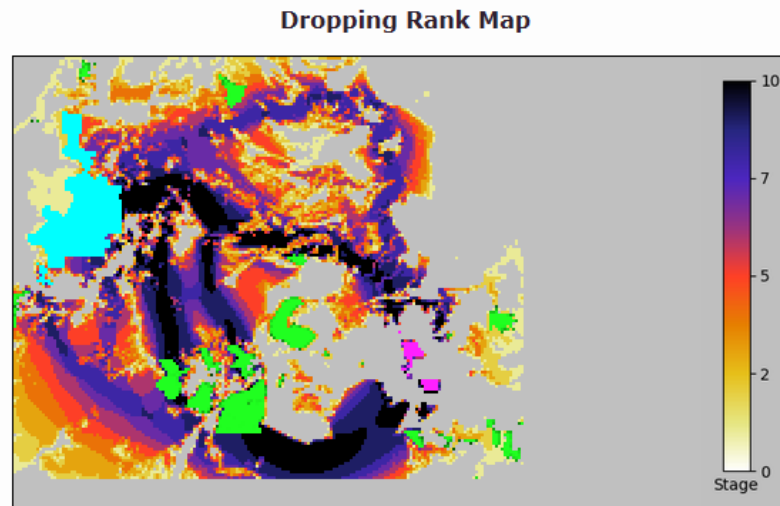
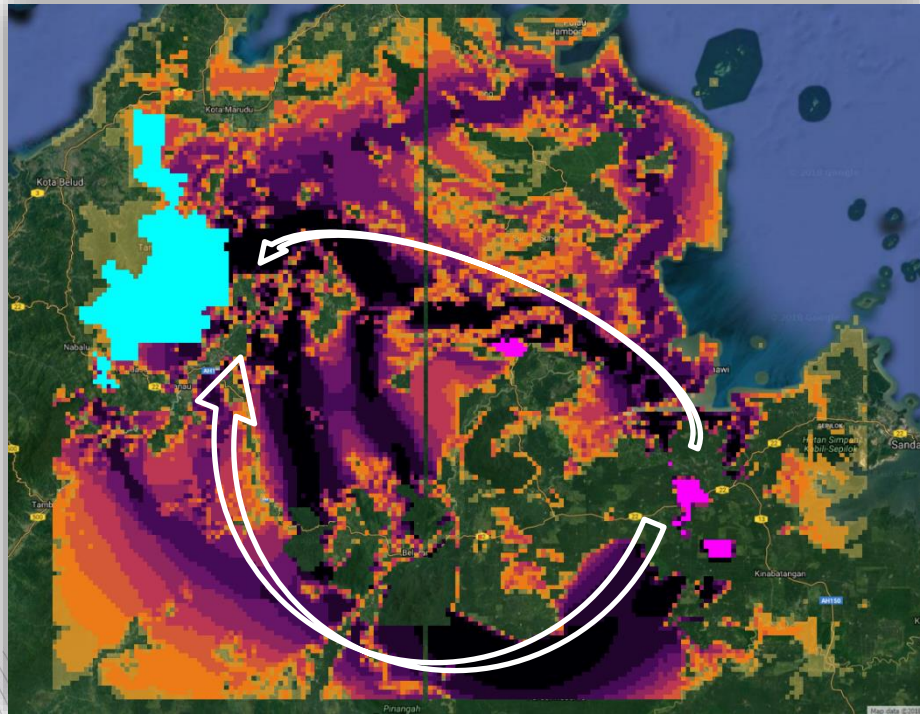


Fig. 2: An illustration of the rank of each habitat cell in the dropping analysis, with each drop stage represented by a different colour on the ramp. The source and target are labelled using **MAGENTA** and **CYAN** respectively. Non-droppable habitat cells are coloured **GREEN**. Lower-ranking cells were dropped earliest because they carried relatively little flow. Higher ranking cells were retained longer, and this implies that they are of higher priority. See table 1 for more information on the cells included in each rank.

Prioritisation analysis

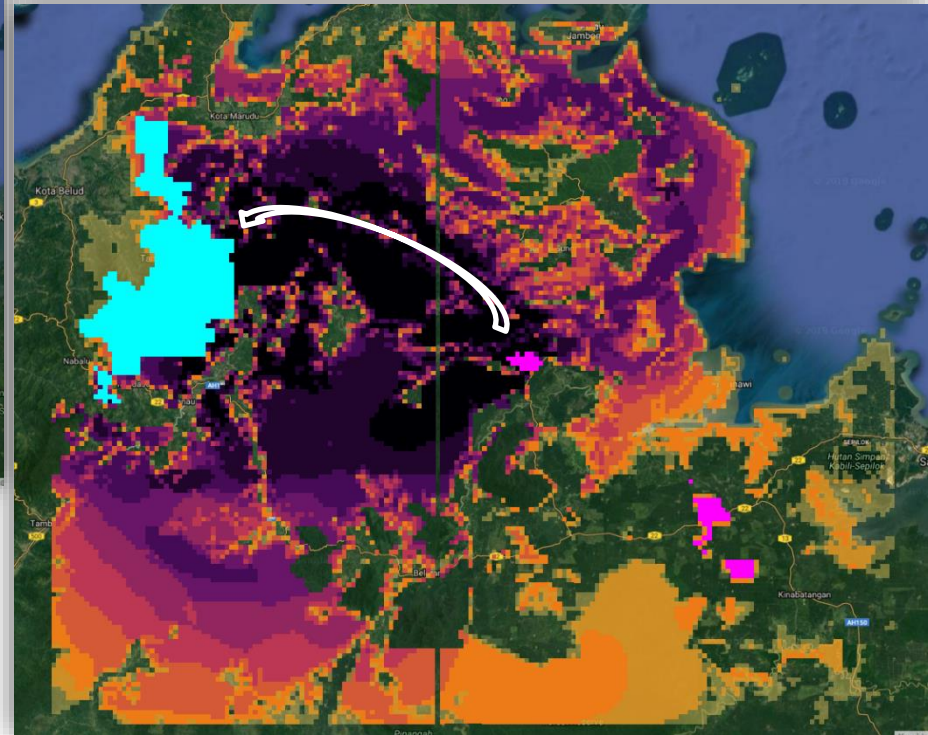
Given limited resources for conservation, which habitat patches are the most important to protect for long-term connectivity between lowland PAs and Mount Kinabalu?



PA1

Comparing **Dropping Rank**

PA2



Synthesis

FLOW analysis 1

As the climate gets warmer, which routes will woodland populations take through the proposed Northern Forest region?

- We learnt how to use a simple auto-generated source and target
- We saw that, although deciduous woodland is far from continuous, there are several routes contributing to the overall flow

FLOW analysis 2

Which routes will heathland populations take to move from habitat patches in the south of England to those in the north? Where are the bottlenecks?

- We learnt how to analyse flow with bottlenecks
- We saw some obvious features bottlenecks tend to have – bridging the worst gaps along a route that species are ‘forced’ to take if they are to reach the target

PRIORITISATION analysis 3

Which currently unprotected forest habitats are a priority for long-term connectivity between lowland protected areas and Mount Kinabalu?

- We learnt what ‘Prioritisation by Dropping’ does
- Just looking at flow alone in these landscapes would not have given such clear priorities of areas to save from logging

**OF COURSE, ANALYSES LIKE THESE ARE ONLY THE
BEGINNING OF YOUR TRAVELS**





condatis



Any Questions....please get in touch:
contact@condatis.org.uk