Helping wildlife move around

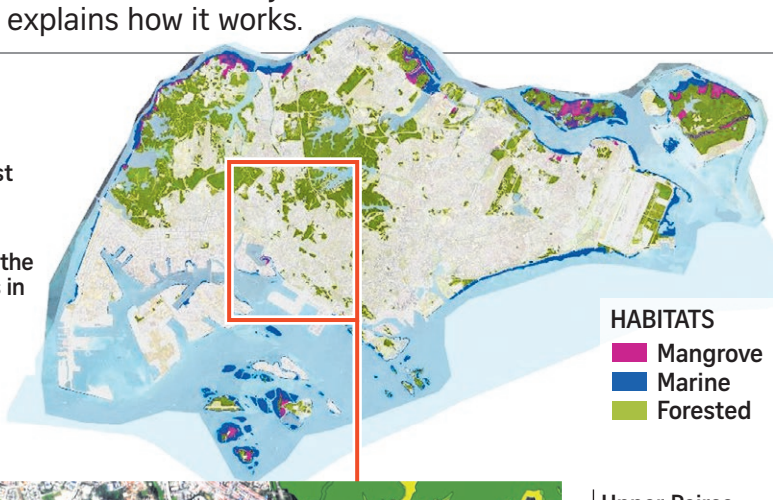
A map of how wildlife in Singapore can move from one forest plot to another has been developed by the National Parks Board (NParks) in consultation with experts. This will give planners an overview of how wildlife connectivity can be maintained, even amid future development. **Audrey Tan** explains how it works.

TIMELINE OF COMPLETION

Quarter 2 — South-west and north-east Singapore

Quarter 3 — North-west Singapore, and the rest of the island, as well as in coastal and marine areas

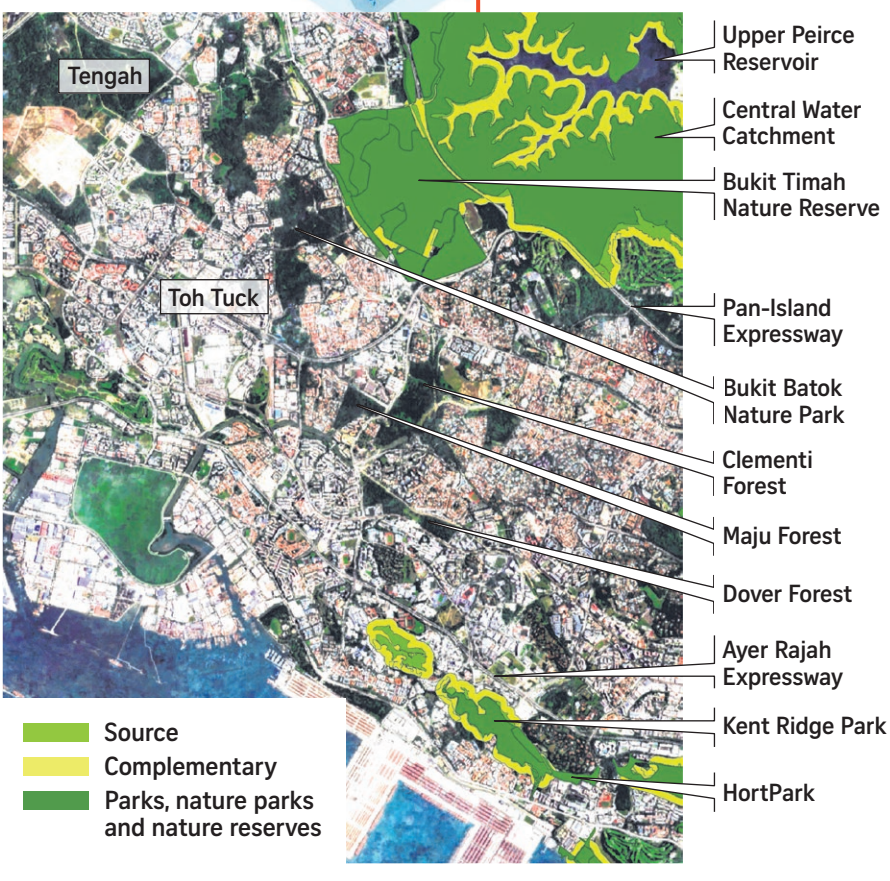
Quarter 4 — Share findings from the exercise with the wider nature community



STEP 1

WHERE THE WILD SPACES ARE

- Source habitats such as nature reserves are marked out on a satellite map of an area, and a **100m green buffer** is added to their boundaries.
- Buffers provide space for recreation, and **reduce pressure on wildlife strongholds.**
- For south-western Singapore, most buffers already fall within NParks' existing nature park network, such as Bukit Batok Nature Park.
- NParks will work with other agencies to see how identified buffer areas outside of the existing network can be planted up.



STEP 2 PATHS OF LEAST RESISTANCE

What is it

- Predicted pathways are plotted based on a method known as **"least-cost modelling"**, which measures how easy or difficult it is for the species to move across the landscape.

How it works

LANDSCAPE DEFINED IN COST UNITS									
3	16	5	14	16	17	3	8	14	5
18	10	16	10	5	1	1	1	1	1
18	5	5	11	1	7	14	5	18	1
Origin		9	8	1	16	5	14	Destination	
		10	1	3	10	17	5		
		1	7	9	14	3	9		
		5	11	8	11	17	5		
18	5	18	3	7	17	11	3	17	17
16	16	3	16	17	5	3	16	5	18
5	14	17	5	9	10	5	7	8	10

LEAST-COST PATH									
3	16	5	14	16	17	3	8	14	5
18	10	16	10	5	1	1	1	1	1
18	5	5	11	1	7	14	5	18	1
Origin		9	8	1	16	5	14	Destination	
		10	1	3	10	17	5		
		1	7	9	14	3	9		
		5	11	8	11	17	5		
18	5	18	3	7	17	11	3	17	17
16	16	3	16	17	5	3	16	5	18
5	14	17	5	9	10	5	7	8	10

LEAST-COST CORRIDOR									
3	16	5	14	16	17	3	8	14	5
18	10	16	10	5	1	1	1	1	1
18	5	5	11	1	7	14	5	18	1
Origin		9	8	1	16	5	14	Destination	
		10	1	3	10	17	5		
		1	7	9	14	3	9		
		5	11	8	11	17	5		
18	5	18	3	7	17	11	3	17	17
16	16	3	16	17	5	3	16	5	18
5	14	17	5	9	10	5	7	8	10

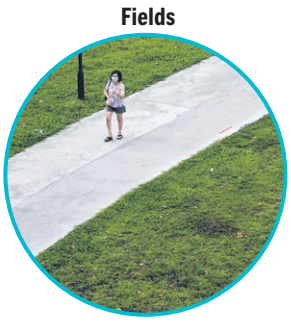
NOTE: For illustration only.

- In this method, various surface structures, such as roads, forests and fields, are assigned a value. A lower value indicates a habitat **more conducive for a species.**

Roads

Forests

Fields



- For example, ground-dwelling pangolins may be more hesitant to cross a road than a hill myna, which can simply fly across. So, a road is assigned a higher value for the pangolin model, compared with the hill myna model.
- This value is assigned based on discussions with those who have expertise in the animal group.

Result

- The **movement pathway for each species** is modelled by selecting a route comprising pixels of the lowest value.

STEP 3

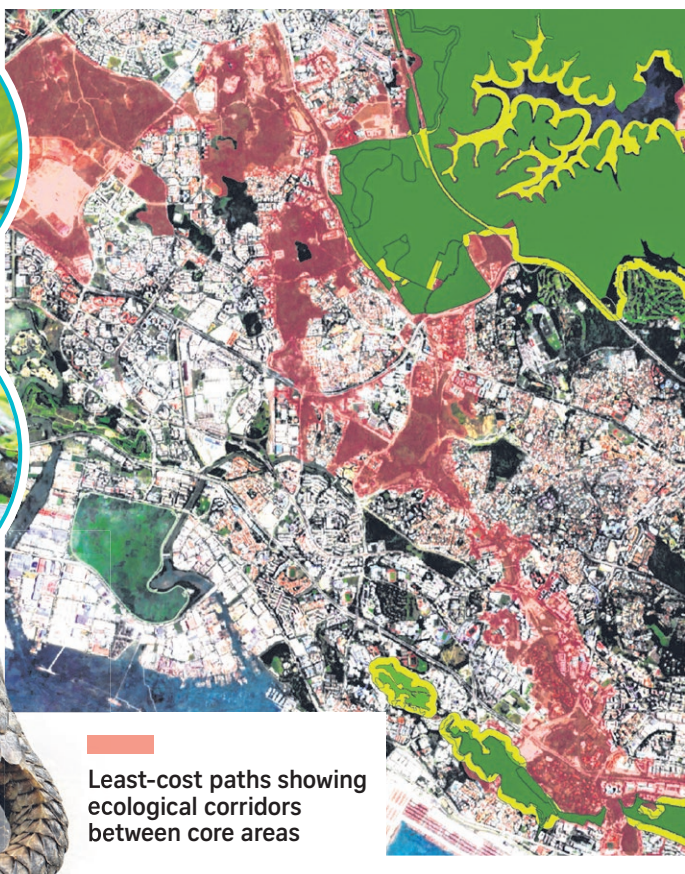
FINDING A GENERAL WAY

- A movement pathway between two source habitats is modelled based on six indicator species – the Annandale's rat, Sunda pangolin, treeshrew, hill myna, blue-winged leafbird and white-rumped shama.
- These species were selected as they are **sensitive forest dwellers** that prior studies have shown can be coaxed to use wildlife corridors, provided a suitable habitat is created for them there.
- The final route is a compilation of the movement pathways of the six species.

Hill myna

Treeshrew

Sunda pangolin



Least-cost paths showing ecological corridors between core areas

Source: NPARKS PHOTOS: NPARKS, MANDAI PARK HOLDINGS, LIM YONG
STRAITS TIMES GRAPHICS: LIM YONG