

A Hundred Otters, More or Less

PASSAGE · NON-FICTION

SKILLS TRAINED

Working memory

Delayed recall

Critical analysis

HOW TO USE THIS SHEET

About 28 minutes

- 1 Read the passage twice, slowly. Take about eight minutes.
- 2 Turn to the next page and cover this one. No looking back.
- 3 Write what you remember, then mark it on the last page.

In the late 1990s staff at Sungei Buloh, the mangrove reserve on Singapore's northern shore, recorded something nobody had expected there for decades: smooth-coated otters, *Lutrogale perspicillata*, hunting in the tidal creeks. They are substantial animals, well over a metre from nose to tail tip, living in family parties that fish together, squabble constantly and sleep in a heap. For most of the twentieth century Singapore had not been a place where anyone saw one, and the sighting was treated as a visit rather than a return.

Within twenty years they were in the middle of the city. One family took up residence around Marina Bay, swimming past the hotels and the barrage; others worked the canals, the reservoirs and the storm drains of a country of a little over seven hundred square kilometres. Otters crossed roads at night and held up traffic. They ate ornamental carp out of garden ponds, which produced the first serious public argument about them, and a government working group was convened to manage what was, unusually, the problem of too much wildlife rather than too little.

The obvious explanation is water. From 1977 Singapore spent ten years cleaning up the Singapore River and the Kallang basin, relocating pig farms, hawkers, boatyards and squatter settlements and laying sewers, so that a river which had been effectively dead carried fish again by the late 1980s. From 2006 a further programme began opening concrete drains out into planted streams and ponds with gravel beds and reeds. Clean water holds fish; fish feed otters; the otters came. It is a satisfying story, it reflects well on a great deal of expensive work, and it is the one most often told.

The difficulty is the gap. The river clean-up was declared finished in 1987, and the otters did not establish themselves in the city for another quarter of a century — a lag long enough to need explaining. A second account fits the timing better. Smooth-coated otters were never far away, with populations across the strait in Johor and a strong tendency to disperse along coasts, and what changed may have been less the water than the reception they met. Hunting and trapping had stopped, the animals were protected by law, and nobody shoots an otter in a reservoir any more.

Both accounts use the same facts and both are defensible, which is why the argument has lasted. The clean-water account answers the question of why there is anything worth eating in a canal, and it is hard to imagine a family of fish-eaters settling in a dead river whatever the law said. The protection account answers why the colonists stayed and bred rather than passing through, and why the arrival happened when it did rather than in 1988. Most of the people working on it would say that both are true and that the interesting question is the weighting — whether the city built a habitat or merely stopped being dangerous.

Then there is the question of how any of this is known, which is stranger than it looks. There has never been a systematic national otter census of the kind run for birds. What exists instead is an enormous body of photographs taken by volunteers, joggers and commuters and shared in groups set up for the purpose, from which researchers identify individual animals by the pale scarring on the nose and the set of the whiskers, and assemble family trees for groups that have acquired names. The widely quoted estimates — something like ten family groups, and a population not far off a hundred — come largely out of that material.

It is remarkable data and it has a bias built into it. The number of recorded sightings depends on the number of otters and on the number of people photographing otters, and the second of those rose steeply over exactly the years in question, as phones improved and the groups grew. A real increase and an increase in attention produce the same rising graph. Researchers correct for this by concentrating on stretches of water that are watched constantly, so that effort stays roughly level, and by matching nose scars so that one animal photographed eleven times is counted once. The otters are indifferent to all of it. At first light a family comes up the canal, and whoever is standing on the bridge takes a photograph.

- 5 Weigh the clean-water explanation against the protection-and-dispersal explanation. Which does the evidence in the passage support better?

- 6 Explain how the way the otter data is collected limits what can be claimed about the population's growth, and assess how well the corrections described deal with the problem.

- 7 A city elsewhere reports that sightings of a rare bird have quadrupled since it opened a reporting app, and concludes the bird is recovering. Using the reasoning of this passage, say what you would want to know before accepting that.

PART C Mark your own work

Now go back to the passage. Tick every answer you got right. You do not need the same words as the answer below — if you wrote the same idea in your own words, it counts.

- ☐ 1 • They work largely from photographs taken by volunteers, joggers and commuters and shared in dedicated groups, identifying individuals by the pattern of pale scarring on the nose and the set of the whiskers and building family trees for named groups. The figures usually quoted are around ten family groups and a population not far off a hundred animals.
- ☐ 2 • Because a cause is expected to be followed fairly promptly by its effect. If clean water were the whole explanation, otters should have appeared soon after the river carried fish again in the late 1980s, and they did not. The delay leaves something unexplained and opens room for a second factor — the end of persecution and the legal protection of the animals — that changed over the later period and so matches the timing of the arrival better.
- ☐ 3 • Bias here is not prejudice but a systematic lean in the measurement: the record tends to err in one direction rather than scattering randomly. Built into it signals that the lean is a feature of how the data is generated — sightings require an observer — rather than a mistake someone made and could stop making. That matters because a random error shrinks as you collect more data, whereas this one grows with the number of observers, so more photographs do not fix it and only a change in method can.
- ☐ 4 • Genuinely respectful but not uncritical. The material is called “remarkable data” and the description of the method — nose scars, whisker patterns, family trees for named groups — is admiring and precise, with no hint that amateur work is second-rate. The criticism that follows is aimed at the structure of the evidence rather than at the people, and it is immediately paired with the corrections researchers apply. The closing image of someone on a bridge at first light leaves the enterprise looking ordinary and valuable at once.
- ☐ 5 • Neither on its own, and the passage is right that the real question is weighting. Clean water is close to necessary: a family of fish-eaters is not going to settle in a dead river however well protected it is, and the river clean-up and the later programme of opening drains into planted streams plainly created the food supply. But necessary is not sufficient, and the timing is the weakness — the water was fixed by 1987 and the city population dates from the 2010s. Protection and dispersal explain that lag, and they also explain persistence rather than mere arrival, since animals that disperse readily will keep testing a coastline and will only stay where they are not killed. The best-supported reading is that clean water set the ceiling on how many otters Singapore could hold and the end of persecution determined when that ceiling began to be filled.
- ☐ 6 • The record counts sightings, not otters, and a sighting requires both an animal and an observer. Since the number of observers rose steeply across precisely the period under study, a genuine increase and a rise in attention generate an identical curve, so the raw data cannot establish growth at all — only that reported encounters increased. The two corrections described are sound and partial. Restricting analysis to stretches of water watched constantly holds effort roughly steady, which converts an uncontrolled record into something closer to a repeatable survey, though it narrows the area to places people happen to frequent. Matching nose scars removes double counting, which prevents one conspicuous family being read as several. Together they make a defensible minimum estimate possible, but neither can recover coverage of the canals and reservoirs nobody photographs, so the national figure of about a hundred remains an estimate with a floor and a soft ceiling.
- ☐ 7 • The reasoning transfers almost exactly: the app is the phones and the groups, and the quadrupling may measure reporters rather than birds. I would want to know how many people

were submitting records before and after, since the count should be set against observer effort rather than reported in raw numbers; whether any sites were watched consistently across the whole period, because those are the only ones where before and after are comparable; whether individuals or nests can be distinguished, so that one conspicuous bird is not logged as four; and whether reporting is concentrated where people walk, which would leave most of the city unsampled. I would also look for an independent measure untouched by the app — ringing returns, nest counts, acoustic recorders left running — because agreement between two methods with different biases is worth far more than a fourfold rise in one. Without those, the honest claim is that encounters have quadrupled.

FACTS RECALLED IN PART A

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QUESTIONS CORRECT

— / 7

DATE

THE STRATEGY **The transfer test**

When you think you have understood something, invent a new case it ought to apply to and run it through — a different city, a different animal, a different experiment — and see whether your understanding survives the move. If you can only answer questions about the exact example you read, you have memorised a passage rather than learnt an idea. Building the new case yourself also forces you to retrieve the reasoning rather than recognise it, which is what makes it stay.

WHERE YOU ALREADY DO THIS

Think of something you learnt for one particular situation — a rule, a technique, a trick. Where else does it apply, and where does it stop working? How would you find out?

FOR THE PARENT OR TEACHER · This sheet trains delayed recall, not reading speed. Let your student read the passage once, then cover it completely before Part A — no glancing back and no prompting, because the effort of hauling a half-remembered fact out of memory is what fixes it there. At this level mark the thinking rather than the wording: the answers given for the inference, tone and analysis questions are one good response each, not the only one.