30-MINUTE PRESENTATION

Australian Raptors

When Food Webs Collapse

How land clearing, rodenticides and reduced prey availability can drive population decline

Image: Wedge-tailed Eagle. Other image credits in reference slide.

Core message

Raptor conservation is food-web conservation: protect prey, remove poison pathways, and keep nesting habitat connected.

Focus species

Red Goshawk • Powerful Owl • Tasmanian Wedge-tailed Eagle • Grey Falcon • Letter-winged Kite

Presentation route

1

Food webs

Why prey availability controls raptor survival

2

Human pressures

Land clearing, poison and simplified landscapes

3

Species cases

How different raptors experience food stress

4

Solutions

Conservation actions that rebuild hunting landscapes

Guiding question: what happens when the landscape no longer feeds its top predators?

Designed from the attached lecture deck and compressed into a professional 30-minute structure

Core thesis: decline begins before death

Raptors may disappear from a landscape long before anyone finds dead birds.

Land clearing

less nesting habitat
less cover for prey
fragmented territories

Rodenticides

poisoned rodents
secondary exposure
weak adults / dead chicks

Reduced food

fewer prey bursts
longer hunting trips
lower breeding success

Population decline

fewer fledglings → lower juvenile survival → aging population → local extinction risk

Sources: DCCEEW State of the Environment 2021; APVMA rodenticide review; DCCEEW Red Goshawk conservation advice

Raptors sit on a food-web pyramid

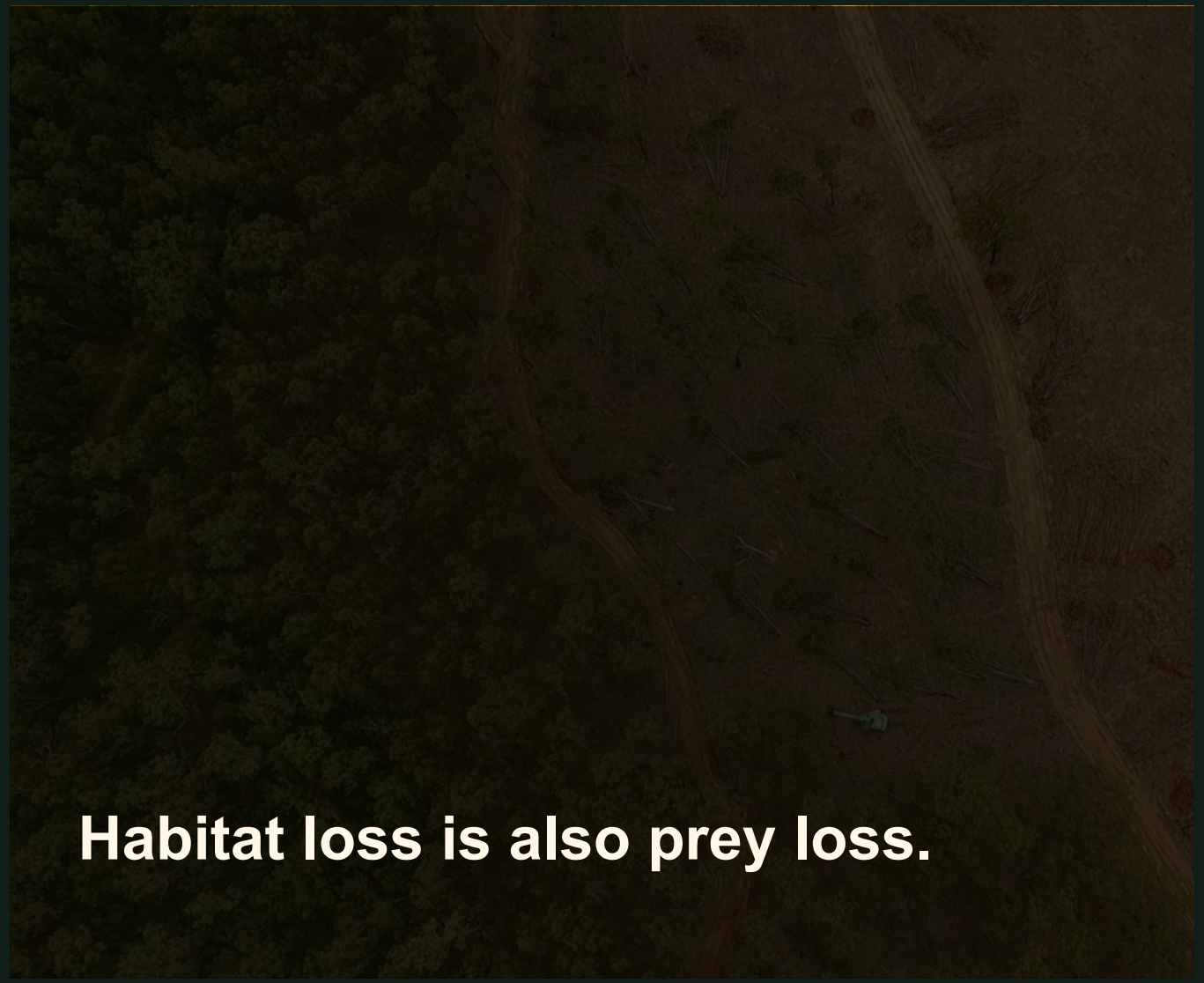
Key principle

Top predators are limited by what happens below them.

Warning sign

Food-web damage often appears first as breeding failure.

Land clearing removes more than trees



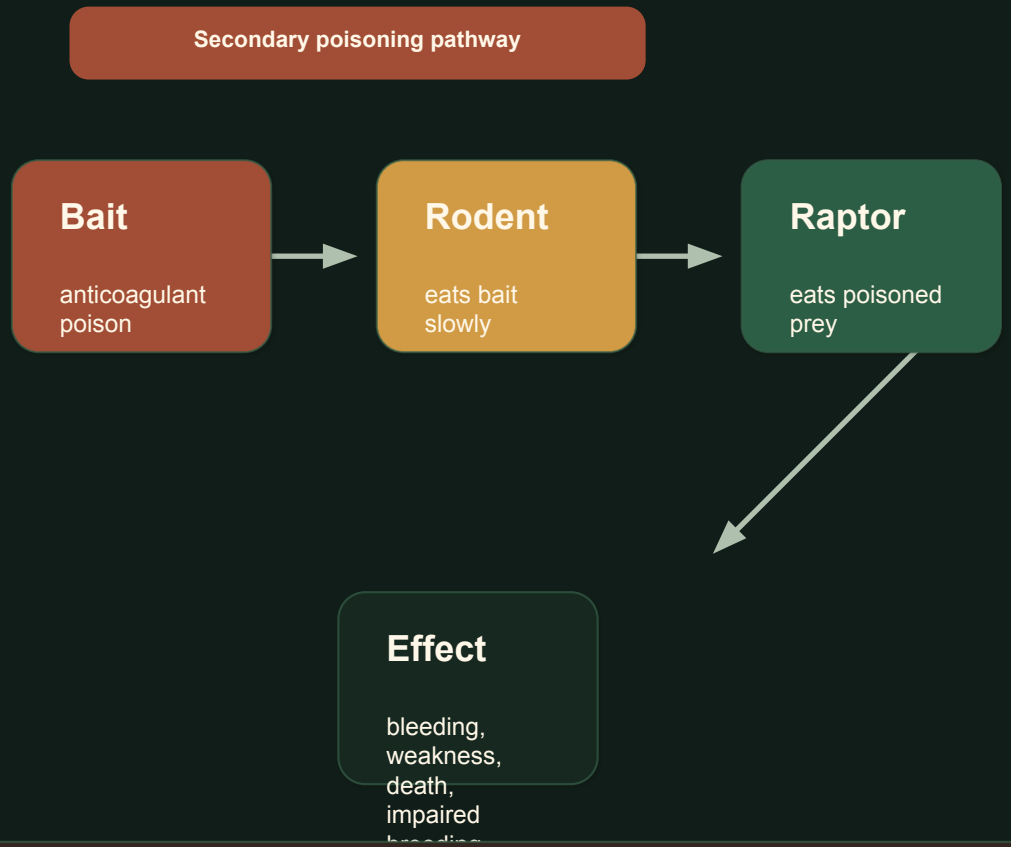
- Fewer old trees and hollows for nesting
- Less ground cover for rodents and reptiles
- Loss of flowering/fruiting plants that feed prey species
- Fragmented hunting territories and safer gaps for competitors
- More road edges, fence lines and collision risk

Sources: Australia State of the Environment 2021; DCCEEW Red Goshawk recovery/conservation advice | Image: WWF Australia

Fragmented landscapes create hidden energy costs

The damage is cumulative: a breeding pair may survive, but fail to replace itself.

Rodenticides turn prey into a delivery system for poison

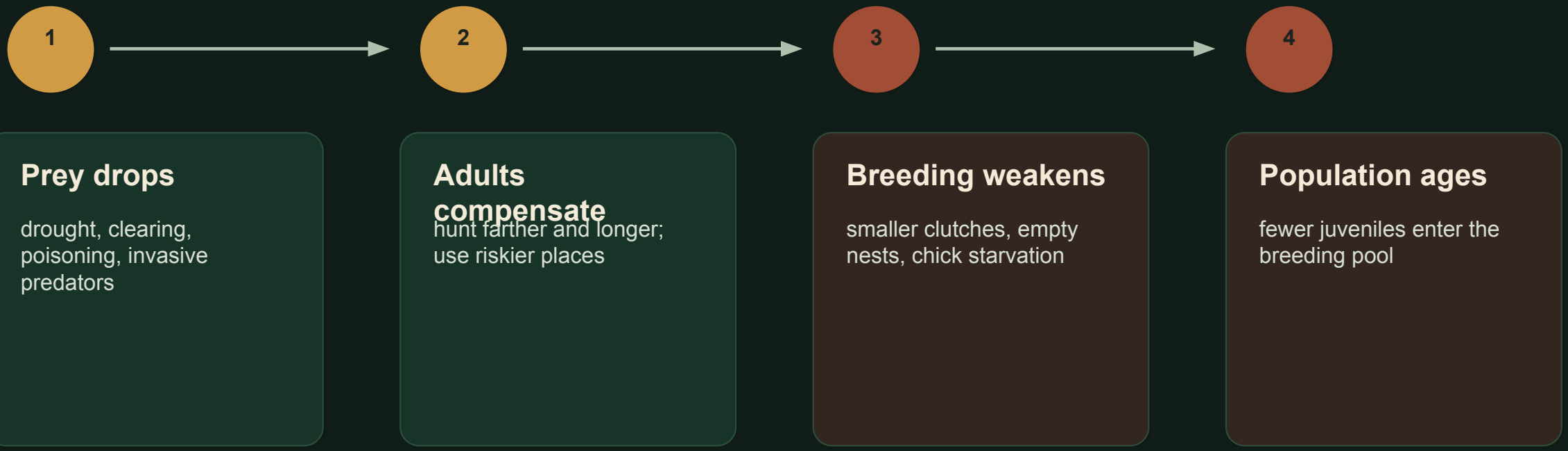


Conservation implication

Raptors cannot safely provide rodent control where poison remains the dominant pest-control method.

Sources: APVMA anticoagulant rodenticide review; BirdLife Australia SGAR campaign | Image: Greater Wellington Regional Council

Food shortage changes behaviour before it changes numbers



In long-lived raptors, fewer chicks today can become population decline years later.

Different raptors, same food-web problem

Species	Main food link	Pressure pathway	Decline signal
Red Goshawk	medium birds	clearing + fragmentation reduce hunting habitat	range contraction / low density
Powerful Owl	possums + gliders	loss of hollows + prey habitat + SGAR exposure	urban edge breeding stress
Tas. Wedge-tailed Eagle	prey + carrion	nest-tree loss, disturbance, collision, poison	low recruitment
Grey Falcon	arid-zone birds	drought and prey pulses fluctuate strongly	boom-bust breeding
Letter-winged Kite	rodents	mouse cycles crash; habitat/poison magnify vulnerability	rapid local disappearance

Sources: DCCEEW species advice; Australian Museum; Bush Heritage; species ecology literature

Case study: Red Goshawk

A specialist bird-hunter needs a specialist landscape.

Forest & woodland
large connected blocks, riparian forests and nesting areas

Medium birds
the prey base that sustains breeding attempts

Red Goshawk
large territory; low density; sensitive to habitat quality

Fledglings
the true recovery signal

Threat mechanism

Clearing and fragmentation can break the chain at multiple points: fewer nesting areas, fewer prey-rich hunting sites, and longer travel distances between suitable patches.

Sources: DCCEEW Red Goshawk conservation advice/recovery plan; MacColl et al. 2023/2024

Case study: Powerful Owl

Food link

Large forest owl; major prey includes possums and gliders in many landscapes.

Habitat link

Needs large old tree hollows for nesting and intact prey habitat around territories.

Poison link

Urban and peri-urban owls can be exposed when they consume poisoned rodents.

A city can look green while still being toxic or food-poor.

Sources: Australian Museum Powerful Owl profile; BirdLife Australia Powerful Owl/SGAR materials | Image: Wikimedia Commons

Case study: Tasmanian Wedge-tailed Eagle

Nest trees

disturbance and clearing remove secure breeding sites

Food access

prey and carrion availability shape territory quality

Human edges

roads, fences, wires and poison increase mortality risk

Result

A long-lived eagle can decline through small changes in breeding success and adult survival over many years.

Sources: Bush Heritage Wedge-tailed Eagle profile; ARC 2025 Tasmanian Wedge-tailed Eagle research note

Arid-zone raptors depend on boom-bust prey cycles

In dry landscapes, food can vanish quickly.

Normal pulse

Rain can trigger plant growth, insects, rodents and birds — a temporary food boom.

Crash phase

When prey collapses, raptors may skip breeding, disperse, or lose nestlings.

Human amplification

Grazing pressure, clearing, altered fire and poison can make natural cycles harsher.

Sources: Australian Museum species profiles; arid-zone raptor ecology | Image: Nankeen Kestrel visual

PRESSURE 3

Agriculture can simplify the prey base

Monoculture

fewer plant types → fewer insects, reptiles and birds

Heavy grazing

less ground cover → prey declines or becomes exposed

Wetland drainage

fewer waterbirds, amphibians and hunting edges

Chemical pressure

pesticides and poisons reduce prey or contaminate it

Raptor decline is often a symptom of a landscape that has become too simple to feed them.

Sources: Australia State of the Environment 2021; raptor food-web synthesis

Climate stress magnifies food shortage

Heat

prey breeding drops; nestlings overheat

Drought

rodent, bird and reptile abundance falls

Fire

ground cover and hollow trees are lost

Flood swings

prey may boom, then crash

The interaction matters

Land clearing, poison and food shortage do not act separately. They stack on top of climate variability, leaving fewer safe refuges when conditions become extreme.

Sources: Australia State of the Environment 2021; climate-change and habitat-stress literature

What food stress looks like in the field

1

Nest signs

empty nests, abandoned eggs, fewer chicks

2

Behaviour

adults hunt farther, more daylight hunting, more risk-taking

3

Body condition

thin fledglings, weak adults, poor feather quality

4

Landscape conflict

more raptors near farms, roads and towns searching for food

Monitoring must track breeding outcomes, not only adult presence.

Field indicators adapted from nest-monitoring and raptor population research

How researchers test the food-shortage hypothesis

Nest monitoring
eggs, hatchlings, fledging success

→

Pellet & prey analysis
what adults actually deliver to chicks

→

GPS tracking
foraging distance and habitat use

→

Camera traps
nest visits and prey delivery rates

→

Prey surveys
rodents, birds, reptiles, possums, carrion

Strong evidence combines several signals

A food-shortage explanation becomes convincing when prey abundance, adult movement, diet and breeding success all point in the same direction.

Methods: nest monitoring, diet analysis, GPS telemetry, camera trapping and prey-abundance surveys

Conservation strategy: rebuild the food web

1. **Protect habitat**
   retain old trees, hollows, riparian strips, wetlands and woodland corridors

2. **Reduce poison**
   prioritise sanitation, exclusion, trapping and safer targeted control

3. **Restore prey base**
   revegetate with native plants; control invasive cats/foxes; manage grazing/fire

4. **Monitor recovery**
   track fledglings, prey abundance and toxin exposure over time

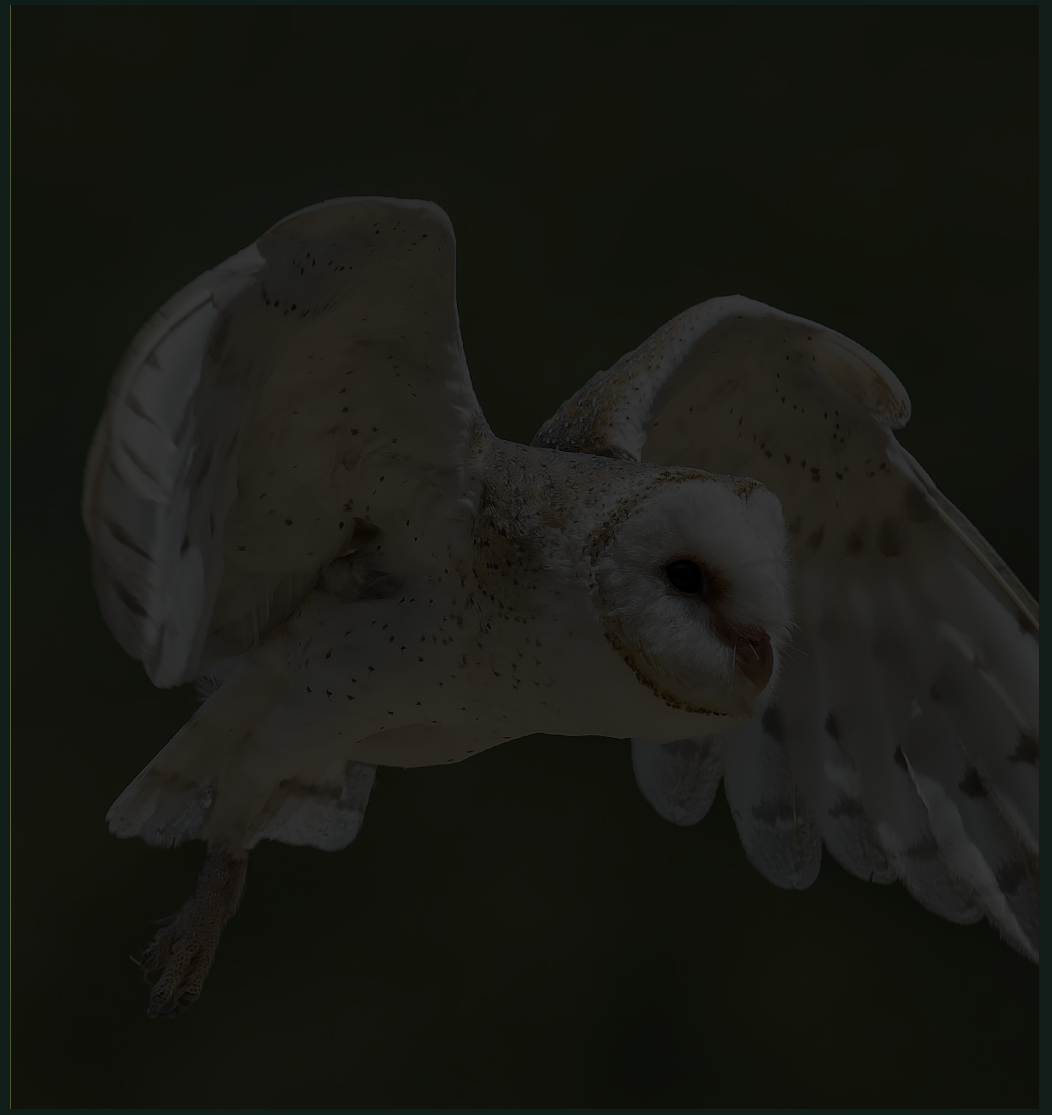
The goal is not just “more raptors” — it is a landscape that can feed them safely.

Sources: DCCEEW recovery planning; APVMA rodenticide review; Landcare-style habitat restoration principles

Raptor-safe rodent control is possible

- Prevention first — remove grain spills, secure bins, seal building entry points
- Mechanical control — traps and exclusion before broad poison use
- Targeted use only — if chemicals are required, use legally approved, contained, short-duration methods
- Predator support — nest boxes/perches only where poison risk is low

Practical message Pest control and raptor conservation are not opposites — but poison-heavy pest control breaks the partnership.



Sources: APVMA 2026 SGAR restricted-chemical certification; BirdLife Australia SGAR campaign | Image: Eastern Barn Owl

Habitat-smart farming supports both prey and predators

Retain old trees

nesting hollows and perches

Native shelterbelts

corridors for prey and hunting edges

Wetland buffers

waterbirds, frogs and insect productivity

Grazing rotation

ground cover and small-prey refuges

Roadkill plans

reduce eagle collisions at dangerous road edges

Sources: habitat restoration and wildlife-friendly farming principles; Bush Heritage eagle threat summary

Policy and community actions

Policy levers

- Stronger controls on high-value habitat clearing
- Long-term monitoring funding
- SGAR restrictions and safer pest-control standards
- Incentives for wildlife-friendly farming
- Planning rules that retain old trees and corridors

Community levers

- Report sightings and nesting attempts
- Keep cats contained
- Avoid risky rodenticides
- Support Landcare and revegetation projects
- Drive carefully where eagles feed on roadkill

The public can help by protecting food, habitat and safety — not only by rescuing injured birds.

Sources: DCCEEW recovery planning; APVMA; BirdLife Australia; local wildlife-care guidance

Discussion questions

1. **Should rodenticides be restricted where owls and raptors are known to breed?**
2. Can raptor-friendly farming be made economically attractive for landholders?
3. Which should come first: protecting raptors or restoring their prey base?
4. How much evidence is enough before changing land-clearing policy?

Use 3–5 minutes depending on presentation format

Conclusion: saving raptors means saving their food webs

When prey disappears, raptors disappear.

Land clearing

removes nests, hunting habitat and prey refuges

Rodenticides

turn prey into poison and can reduce survival or breeding success

Food shortage

appears as nest failure, poor recruitment and local decline

Conservation

must rebuild habitat, prey abundance and safe pest-control systems

Selected references and image credits

Key scientific and conservation sources

• Australian State of the Environment 2021 — native vegetation and habitat fragmentation
• DCCEEW Red Goshawk conservation advice and national recovery plan
• APVMA anticoagulant rodenticide review and 2026 SGAR restricted-chemical certification
• BirdLife Australia — SGAR impacts and raptor conservation campaigns
• Australian Museum species profiles — Powerful Owl, Barn Owl and Australian raptors
• Bush Heritage Australia — Wedge-tailed Eagle threat summary
• MacColl et al. 2023/2024 — Red Goshawk range/diet research

Image credits

• Wedge-tailed Eagle, Black-shouldered Kite, Eastern Barn Owl, Nankeen Kestrel: Wikimedia Commons / CC-licensed images used in the previous deck
• Powerful Owl: Wikimedia Commons
• Land clearing aerial image: WWF Australia
• Rodenticide pellets: Greater Wellington Regional Council
• All images are used for educational presentation design; verify licensing for public distribution.

References are condensed for slide readability; add full academic references if required by your course

Charity Social and
NATURAL PROJECT

Charity Social and
NATURAL PROJECT

Charity Social and
NATURAL PROJECT

Australian Raptors Conservation