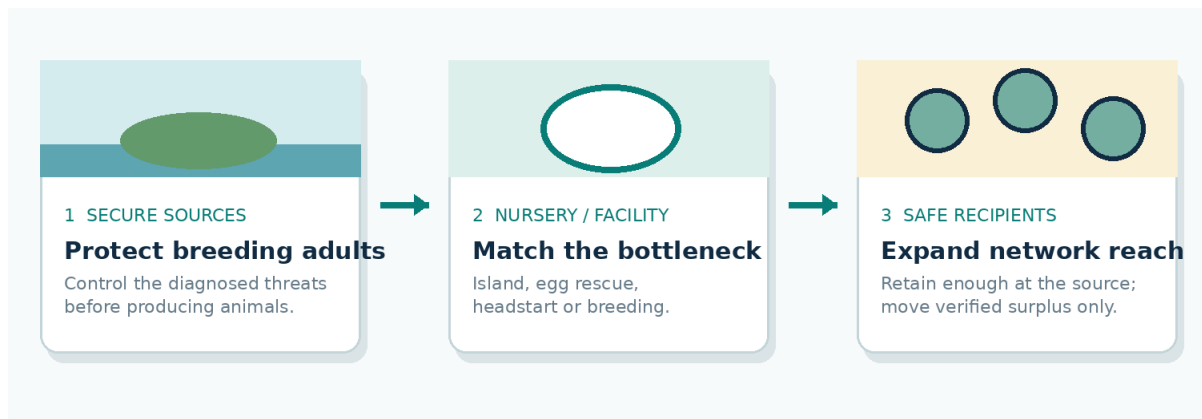


TURTLEPLANNER

Turtle Conservation Portfolio Tool

Step-by-step user guide and output interpretation



turtle-conservation-tool.emydura.chatgpt.site

Species-informed screening for freshwater turtles and tortoises

QUICK START

Build a defensible portfolio in four steps

TurtlePlanner helps teams compare intervention portfolios using the same population, cost and metapopulation framework. It is designed to structure an early planning conversation, expose assumptions and identify the analyses needed next.

01	Species	Load a species profile or enter custom biology; confirm aquatic or terrestrial habitat.
02	Threats + sites	Select one or two bottlenecks, define source and recipient populations, and pass the threat-control gate.
03	Costs	Enter local lifecycle costs and realistic production, retention and release assumptions.
04	Recommendation	Compare population outcomes, risk, cost-effectiveness, network reach and the site-concept visual.

The core rule

Diagnose the bottleneck first. Producing more animals will not compensate for continuing adult mortality, unsafe habitat or unsuitable recipient sites.

Before opening the tool

- Define the planning population and geographic scope.
- Assemble the best available demographic estimates, even if uncertain.
- List the main threats and identify which can actually be controlled.
- Separate source populations from possible recipient populations.
- Use whole-of-program costs, not only construction or animal-production costs.

STEP 1

Load the species and check its biology

Begin typing a common or scientific name. Suggestions appear as you type. Selecting a species loads a planning profile; published, derived and imputed values remain visibly distinguished.

Parameter	What it controls	Check locally
Eggs per female per year	Potential annual production	Clutch size and clutches per year
Age at maturity	Delay before recruits become adults	Sex- and site-specific maturity
Adult survival	Persistence of the breeding population	Roads, harvest, bycatch, disease
Juvenile survival	Conversion of releases into future adults	Stage definition and monitoring method
Egg-to-year-one survival	Natural recruitment baseline	Nest predation, flooding and hatchling loss
Starting adults	Scale of the source population	Current abundance and uncertainty

Aquatic or terrestrial?

The habitat selector is automatically inferred from the species profile and can be changed for a custom planning unit. This selection changes intervention names, assumptions, costs and the output visual.

Do not accept a preload uncritically

A preloaded profile is a defensible starting point, not local truth. Override a value when reliable site-specific evidence is available and document the reason.

STEP 2

Name one or two bottlenecks

Select the processes most likely to limit recovery. If two are selected, the first is treated as primary and the second as secondary. TurtlePlanner weights them 65:35 when calculating portfolio fit.

Bottleneck	Typical evidence	Likely response
Adult mortality	Roadkill, harvest, bycatch, disease, predators	Protect adults and secure habitat first
Nest / egg loss	Predation, flooding, trampling, disturbance	Nest protection, island or targeted egg rescue
Juvenile survival	Poor post-hatching survival or size refuge	Headstarting only if a release-size benefit is credible
Habitat insecurity	Loss, access, tenure or weak protection	Reserve, agreement or property protection
Critical rarity	Too few breeders or genetic risk	Conservation breeding may be justified
Unknown	Evidence is insufficient	Research and protection before scaling production

Two bottlenecks are not two independent programs

The strongest portfolio often combines site protection with a targeted production action. Use the priority order to express which constraint matters most.

STEP 2 CONTINUED

Define the conservation network

Land pathway

Pathway	Acquisition assumption	Use when
Existing reserve	No land purchase cost	The site is already protected and management access is secure
Stewardship / lease	Discounted tenure cost	Protection can be delivered through agreement rather than purchase
Purchase property	Full entered land cost	Long-term control requires acquisition

Source and recipient populations

Choose up to four secure source populations and identify the number of recipient populations that could realistically receive animals. Recipients are not counted as beneficiaries merely because they exist; they must receive the full annual allocation entered later in the tool.

Threat-control gate

Gate passed

Proceed only when threats can be controlled across source and intended release sites. This does not mean every threat has disappeared; it means remaining risk is understood, manageable and monitored.

Gate not passed

Pause releases. Invest first in safety, tenure, habitat, threat reduction and monitoring. Releasing into a sink can waste animals and money.

STEP 3

Enter lifecycle costs

Enter costs in USD using a consistent base year. TurtlePlanner discounts annual expenditure across the planning horizon and includes site security, infrastructure, people, operations, monitoring and delivery to recipient populations.

Cost group	Include
Land and site	Purchase or agreement, due diligence, fencing, restoration, access and setup
Aquatic nursery	Island construction, anchoring, substrate, maintenance, monitoring and replacement
Terrestrial nesting zone	Predator-exclusion fencing, patrols, nest guards, fire management and habitat restoration
Facility	Design, approvals, biosecurity, incubation, utilities, staff, veterinary support and maintenance
Headstarting / breeding	Husbandry, feed, staff time, genetics, welfare, marking and quality assurance
Recipient delivery	Health screening, transport, release, monitoring and adaptive management

Production and redistribution assumptions

- Egg coverage is a ceiling, not a target.
- Source retention is the proportion kept to rebuild the producing population.
- Animals per recipient per year defines what counts as a fully supported recipient.
- Surplus smaller than one full allocation remains visible but does not create another supported population.

STEP 4

Build and read the recommendation

Select Build conservation portfolio. The leading recommendation is the portfolio with the strongest combined fit to the bottleneck, projected effectiveness, risk reduction, readiness and cost-effectiveness under the entered assumptions.

ADULTS AT HORIZON

Expected size

Direction

Read together, never alone

DOWNSIDE

10th percentile

Uncertainty

Read together, never alone

QUASI-EXTINCTION

Threshold risk

Security

Read together, never alone

COST / ADDED ADULT

Lifecycle value

Efficiency

Read together, never alone

Output	Interpretation	Avoid
Adults at horizon	Median adult abundance at the selected year	Treating it as a guaranteed count
Downside outcome	10th-percentile adult abundance	Ignoring the lower tail
Quasi-extinction risk	Runs falling below 10% of starting adults	Reading zero risk as certainty
Cost per additional source adult	Program NPV divided by added source adults	Comparing programs with different horizons or cost bases
Bottleneck match	Fit to primary and secondary constraints	Choosing match alone without feasibility

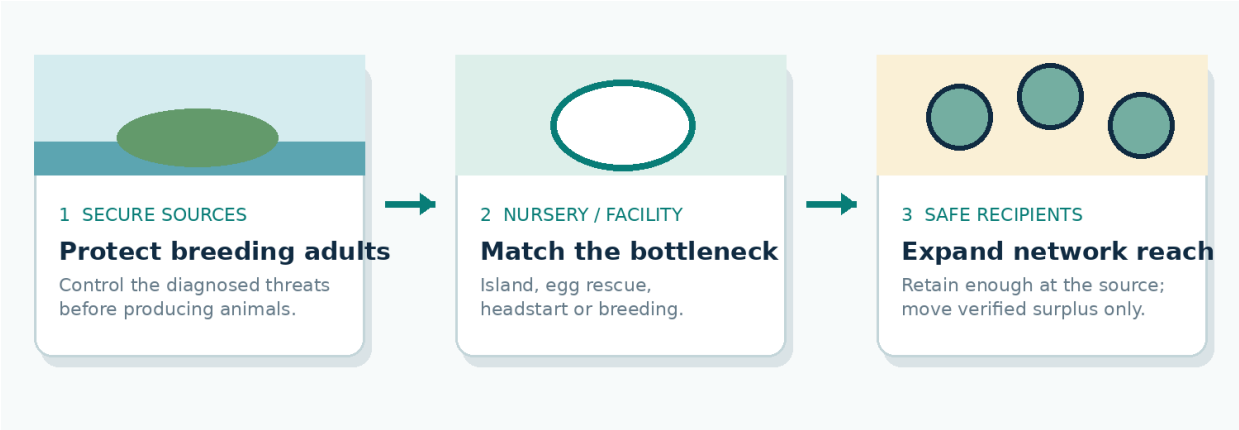
Read the four metrics together

A portfolio can produce many animals yet be inefficient, risky or poorly matched to the actual constraint. No single metric is the answer.

NEW OUTPUT

Use the site-concept visual

The concept visual translates the selected portfolio into a generic on-ground story. Its purpose is to help practitioners, landholders and partners imagine the spatial and operational structure at their own sites.



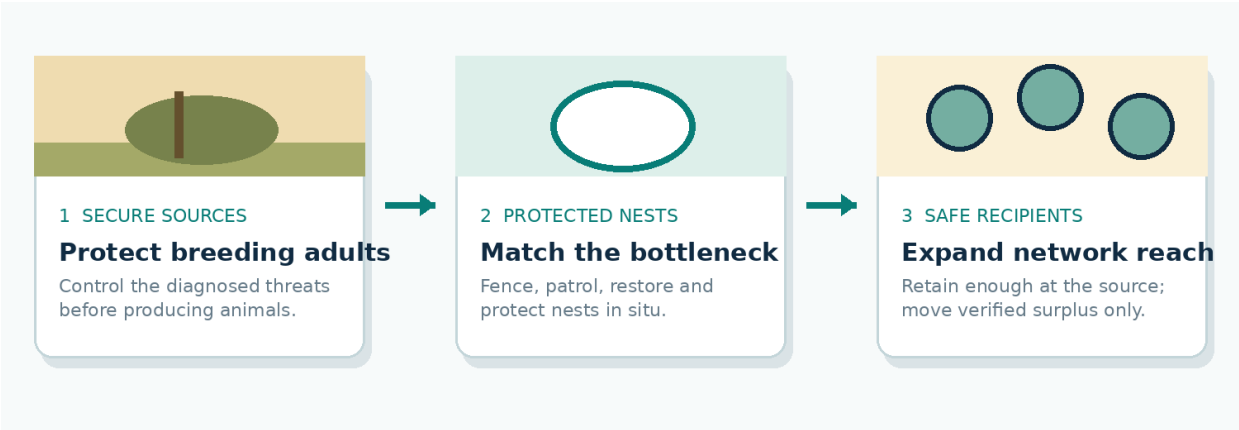
Visual element	Meaning
Secure sources	Breeding adults and core habitat are protected before production is scaled
Recommended intervention	The physical or operational action matched to the bottleneck
Safe recipients	Additional populations that can receive a full annual allocation
Source-first rule	Production is retained until source recovery targets are met
Recipient gate	Genetics, health, habitat suitability and threat control remain mandatory

It is a conversation aid, not an engineering drawing

The graphic does not specify dimensions, locations, permits, release densities or construction details. Translate it into a site-specific feasibility design with local experts.

TERRESTRIAL PATHWAY

What changes for land tortoises



Nesting islands are not offered as a terrestrial intervention. When the selected species or custom planning unit is terrestrial, TurtlePlanner substitutes a protected nesting landscape and changes the related labels, production assumptions, costs and interpretation.

Aquatic module	Terrestrial substitute
Nesting island	Predator-safe nesting zone within protected land
Island construction	Fencing, patrol access and nesting-habitat works
Island care	Fence maintenance, predator and fire management, vegetation and substrate management
Hatchling collection	Controlled collection from protected natural nests where justified
Aquatic recipient	Secure terrestrial release landscape with appropriate forage, shelter and connectivity

Natural incubation remains possible

A terrestrial protected-nesting portfolio can produce hatchlings for source recovery or redistribution without transferring eggs to a facility. Egg rescue remains a separate option for nests that cannot be protected safely in place.

METAPOPULATION OUTPUT

Follow production from source to recipient



For production portfolios, TurtlePlanner presents an annual accounting chain. This makes the conservation network explicit and prevents all hatchlings or juveniles from being treated as an immediate gain to the source population.

Stage	Calculation	Interpretation
Production	Estimated release-stage animals per year	Potential cohort before allocation
Source retention	Production x retention percentage	Animals reserved for source recovery
Available surplus	Production - retained	Potential redistribution pool
Allocated	Full recipient allocations only	Animals assigned to supported recipients
Future-adult equivalents	Allocated x survival to maturity	Expected demographic contribution, not a guarantee

Why supported recipients can be zero

A portfolio may produce surplus animals but still fail to meet the full annual allocation entered for one recipient. Change the allocation only if the revised release strategy is biologically and operationally credible.

COMPARE ALTERNATIVES

Use the chart and ranked portfolio table

Population projection

The chart compares the selected portfolio with current management. Use it to examine direction, delay and divergence—not as a precise forecast. Long-lived species may show a delayed response because protected hatchlings take years to recruit into the adult population.

Ranked intervention portfolios

Select any portfolio row. The population projection, detailed metrics, metapopulation reach and site-concept visual update together. This is essential for sensitivity thinking: the first-ranked option should be compared with plausible alternatives, not accepted automatically.

Portfolio	When it may lead	Key caution
Secure wild populations	Adult mortality or habitat insecurity	Requires enforceable, sustained threat control
Protected nursery / nesting landscape	Nest loss plus secure source habitat	Aquatic and terrestrial implementations differ
Targeted egg rescue	A defined subset of nests is at acute risk	Facility does not fix unsafe wild habitat
Headstarting	Early juvenile survival is the true bottleneck	Must demonstrate release-size benefit
Conservation breeding	Critical rarity or genetic rescue	High cost, founder and genetic constraints

INTERPRET CAREFULLY

Sensitivity, uncertainty and stopping rules

Run structured alternatives

- Best estimate, optimistic and conservative demographic inputs.
- Existing reserve, stewardship agreement and full property purchase.
- One versus several secure source populations.
- Low versus high facility and staff costs.
- Different source-retention and recipient-allocation rules.
- Primary and secondary bottlenecks in both priority orders.

Define evidence thresholds before implementation

Decision	Example evidence
Start	Threat-control gate passed; permits, welfare, genetics, health and funding secured
Continue	Source recovery and release-stage survival meet pre-agreed benchmarks
Adapt	Costs, survival or recruitment differ materially from assumptions
Stop	Threats persist, welfare is compromised, donor safety declines or releases fail repeatedly

Suggested review points

Assess establishment and implementation at years 1-3, demographic response at years 5-10, and longer-term adult recruitment over a timeframe appropriate to the species.

COMMON ERRORS

What TurtlePlanner cannot decide for you

Error	Why it matters	Better practice
Starting with an intervention	The preferred action may not address the limiting process	Diagnose bottlenecks first
Counting every hatchling as a benefit	Most will not become reproductive adults	Use stage survival and future-adult equivalents
Ignoring adult mortality	Small losses can dominate long-lived turtle dynamics	Protect breeders before scaling production
Treating a recipient as ready	Presence of habitat is not proof of safety or suitability	Complete site, genetics and health assessment
Using construction cost only	Staffing, monitoring and maintenance drive lifecycle cost	Use discounted whole-program expenditure
Reading the visual literally	Generic diagrams omit site geometry and regulation	Develop a site-specific feasibility plan

Model boundary

TurtlePlanner is a species-informed screening model, not a validated population viability analysis. It helps shortlist portfolios and expose consequential assumptions. Investment decisions require local demographic data, social and cultural engagement, landholder agreement, welfare review, biosecurity, disease and genetic assessment, regulatory approval and adaptive monitoring.

FIELD CHECKLIST

From screen result to conservation plan

✓	Planning question	Evidence to record
☐	Problem definition	Population, geography and recovery objective are explicit
☐	Evidence	Primary and secondary bottlenecks are supported by field data or clearly identified uncertainty
☐	Species biology	Preloaded parameters have been checked and local overrides documented
☐	Habitat pathway	Aquatic or terrestrial classification is correct
☐	Source safety	Adult survival, habitat and donor capacity are protected
☐	Recipient safety	Threats, habitat, carrying capacity and monitoring access are acceptable
☐	Animal movement	Genetic, disease, welfare and regulatory gates are passed
☐	Costs	Lifecycle costs and contingency are included
☐	Allocation	Source retention and recipient releases have explicit biological targets
☐	Monitoring	Start, adapt and stop rules are agreed before action

Recommended planning record

Export or print the planning brief, record the date and model assumptions, retain all source data, list uncertainties, name the decision-makers and schedule the first review. A TurtlePlanner result should remain traceable as evidence improves.