HPG Intelligence

Holistic Planned Grazing

with Geodatatrack EOV Integration

User Manual

Version 1.0 · March 2026

Based on Savory Institute Holistic Management methodology and EOV 3.0 protocol

Contents

1. Introduction and Overview

What is HPG Intelligence?

HPG Intelligence is a web-based decision support tool for Holistic Planned Grazing (HPG) practitioners. It integrates farm mapping, seasonal planning, grazing chart management, ecological monitoring via the Savory Institute's Ecological Outcome Verification (EOV) protocol, and an AI-powered advisor — all in a single, deployable HTML application.

The tool is designed specifically for farms and ranches using Geodatatrack as their field data collection platform. KML farm maps exported from Geodatatrack are parsed directly into the planning model, and EOV Short Term Monitoring (STM) data drives the control loop.

The Planning Philosophy

HPG Intelligence is not a rotation scheduler. It is a decision support system grounded in the Holistic Management framework developed by Allan Savory. The core principle that governs every calculation in the tool is:

> **Core principle**
> Overgrazing is a function of TIME, not animal numbers. Recovery periods are planned first. Grazing periods derive from them. Every early move reduces recovery time in ALL remaining paddocks.

This means the tool will always prompt you to plan your recovery period before anything else, and every alert and recommendation it generates flows from that principle.

The Control Loop

HPG Intelligence implements the four-stage management cycle that Savory describes:

Stage	What happens
Plan	Build a growing or nongrowing season plan using the aide memoire sequence. Set recovery periods first; derive grazing periods from them.
Monitor	Import Geodatatrack EOV data annually. STM indicators — especially bare soil — provide early warning before ecological damage

Stage	What happens
	compounds.
Control	Adjust the plan for minor deviations: animals moving early, growth rate changes, forage quality shifts. Small corrections prevent replanning.
Replan	Major events — fire, drought, sustained EHI decline — trigger a full replan. The tool models destocking scenarios and amalgamation options.

What the tool does not do

HPG Intelligence is a decision support tool, not an autonomous management system. It will never:

- Move animals for you or issue automated instructions
- Replace field observation and practitioner judgement
- Prescribe a fixed rotation schedule
- Guarantee ecological outcomes — those depend on your management

Key concepts at a glance

Term	Definition
ADA / ADH	Animal Days per Acre or Hectare. The volume of forage taken from an area. Formula: Animals × Days ÷ Area.
SAU	Standard Animal Unit. A common currency for comparing animals of different species and sizes. A 1,000 lb dry cow = 1.0 SAU.
Recovery period (RP)	The time a paddock rests between grazings. The most important variable in HPG. Always planned first.
Grazing period (GP)	Time animals spend in one paddock. Derived from RP: GP = RP ÷ (paddocks − 1).
EHI	Ecological Health Index. The sum of EOV STM indicator scores, calibrated to your ecoregion reference area.
STM	Short Term Monitoring. Annual EOV field assessment of 15 leading ecological indicators across ≥10 sites.
LTM	Long Term Monitoring. Five-yearly deep assessment of soil carbon, water infiltration, and species diversity.
Brittleness	A scale from 1 (non-brittle, humid) to 10 (very brittle, arid). Determines how management tools behave.

2. Getting Started

System requirements

HPG Intelligence is a single-page web application. It requires only a modern web browser — no installation is needed. The HPG Advisor requires an internet connection to call the AI service.

Requirement	Detail
Browser	Chrome 90+, Firefox 88+, Safari 14+, Edge 90+
Internet	Required for the HPG Advisor and map tiles. All other features work offline once loaded.
Screen	Minimum 1024 × 768 px recommended. Optimised for desktop and tablet.
KML files	Exported from Geodatatrack. Standard KML 2.2 format with Polygon placemarks.
EOV data	CSV or JSON exports from Geodatatrack STM field sessions.

Deploying the tool

The tool is distributed as a single HTML file (index.html) with two supporting files for the Netlify deployment. See Chapter 11 for full deployment instructions. For quick local use, open index.html directly in your browser.

First time setup

When you first open the tool, sample data for a fictional farm ("Homestead Farm") is loaded so you can explore every feature immediately. To set up your own farm:

1. Open the Farm Map panel and import your Geodatatrack KML export. This is the quickest way to populate the paddock register with correct names, areas, and GPS coordinates.
2. Click "Sync to plan" on the Farm Map panel. The paddock register, grazing chart, and planning calculator will all update with your actual farm data.
3. Go to the Planning panel and update the farm details: ecoregion, brittleness, total SAU, growing season dates.
4. Open the SAU Calculator (Planning → SAU Calculator tab) and enter your current herd composition.
5. Open the EOV Monitor panel and import your most recent Geodatatrack STM export to establish your baseline EHI.
6. Open the HPG Advisor and introduce your farm. The advisor will use the current data context to tailor its responses.

Navigating the interface

The interface has three navigation layers:

- The header navigation bar provides quick access to the six main panels: Dashboard, Planning, Grazing Chart, EOV Monitor, Farm Map, and Advisor.
- The left sidebar provides access to all panels including sub-sections: Paddocks, Farm Map, Herds & SAU, Seasonal Plan, Grazing Chart, Formulas, EOV / EHI, Trends, Context Checks, and HPG Advisor.
- Within some panels, inner tabs switch between sub-views — for example, the Planning panel has three tabs: Plan Calculator, Destocking Scenarios, and SAU Calculator.

About the sample data

The sample data (Homestead Farm, 12 paddocks, 186 SAU, EHI 68) is for demonstration only. It is not saved between sessions. Until you import your own KML and EOV data, all figures shown are illustrative.

3. Dashboard

Overview

The Dashboard is the home panel, showing the current state of your farm across four key dimensions: ecological health, recovery period, grazing period, and total SAU. It is designed to be read daily during the growing season.

Stat cards

Four stat cards across the top of the dashboard display:

Card	What it shows
EHI Score	Your farm's current Ecological Health Index, sourced from the most recent Geodatatrack STM import. The trend badge shows movement since baseline.
Recovery Period	The current planned recovery period in days, and whether you are in slow or fast growth mode.
Avg Grazing Period	The calculated average grazing period (GP = RP ÷ (paddocks − 1)), and whether it falls within plan.

Card	What it shows
Total SAU	Total Standard Animal Units across all herds, and whether this is within the planned stocking rate.

Active alerts

The alerts panel shows items requiring your attention, ranked by urgency:

- Red (critical) — Immediate action required. Typically bare soil increasing at a monitoring site, or an EHI decline. The alert explains the cause-and-effect, cites the HPG principle, and recommends a specific control action.
- Amber (warning) — Action required soon. Typically cumulative early moves reducing recovery periods, or a forage quality signal.
- Green (info) — Positive trends worth noting. Typically improving indicator scores.

The most important alert

If bare soil is increasing at any STM site, this will always appear as a critical alert. Bare soil is double-weighted in the EHI score because it disrupts all four ecosystem processes simultaneously: water cycle, mineral cycle, energy flow, and community dynamics.

Paddock status table

The paddock status table shows the current state of every paddock in the rotation:

Column	Meaning
Status	Grazing (animals currently present), Recovery, or Recovery Alert (EHI concern).
Days in	For grazing paddocks: days since animals entered. For recovery paddocks: days since animals left.
ADA actual	Recorded animal-days per acre/hectare from the completed grazing visit.
ADA est.	Estimated animal-days available from the last forage assessment.
Last EHI	The EHI score recorded at the STM site most closely associated with this paddock.
Next move	Estimated days until the planned move-in date (recovery paddocks) or move-out date (grazing paddocks).

Current calculations panel

The right sidebar shows a live summary of the key planning figures derived from your current data: recovery period, average GP, total SAU, stocking rate, and current growth rate classification (Fast / Slow / Zero).

These figures update automatically when you sync a KML file or change planning parameters.

4. Farm Map — KML Import

Overview

The Farm Map panel is the geographic foundation of the tool. It reads KML files exported from Geodatatrack, parses paddock polygons, calculates accurate areas using spherical geometry, and plots everything on an interactive OpenTopoMap base layer — providing topographic and land-cover context ideal for grazing management.

Importing a KML file is the recommended first step for any new farm, because it ensures that paddock names and areas in the planning model exactly match your Geodatatrack setup.

Exporting a KML from Geodatatrack

In Geodatatrack, navigate to your farm and use the export function to produce a KML file. Ensure paddocks are drawn as polygon features — point or line features will not be recognised as paddocks by the import parser.

7. In Geodatatrack: Farm → select your farm → Export → KML
8. Save the .kml file to your device
9. In HPG Intelligence: Farm Map panel → drag the file onto the drop zone, or click to browse

What the parser extracts

For each Polygon placemark in the KML file, the parser extracts:

Data field	Source and method
Name	From the KML <name> tag. This is matched against existing paddock records to link spatial data to planning data.
Description	From the <description> tag, if present. Displayed in the paddock

Data field	Source and method
	popup on the map.
Coordinates	The outer boundary ring of the polygon. Inner rings (holes) are noted but not used in area calculation.
Area (ha)	Calculated using the spherical excess formula applied to WGS84 coordinates. Accurate globally without requiring a projection. If Geodatatrack has stored area in extended data fields, that value is used preferentially.
Centroid	Arithmetic mean of all vertex coordinates. Used for map label placement and EOV site proximity matching.
Extended data	Any key-value pairs in the Geodatatrack <ExtendedData> block, including area_ha, notes, and paddock codes.

Reading the map

Once a KML is imported, paddocks are displayed as coloured polygons:

Visual element	Meaning
Dark green fill	Paddock currently being grazed (matches the "grazing" status in the planning model).
Mid green fill	Paddock in normal recovery.
Red-tinted fill	Paddock flagged as "recovery-alert" — an EHI concern has been raised at the associated STM site.
Amber highlight on hover	Active hover state — paddock name and popup appear.
Circular markers	EOV STM monitoring sites. Colour indicates EHI: green ≥65, amber 55–64, red <55. The EHI score is printed inside the circle.

Click any paddock polygon or STM site marker to open a popup with full details: area, status, last EHI score, forage ADA estimate, and centroid coordinates.

Map controls

Control	Action
Fit view	Zooms and pans the map to show all paddocks. Use this after a KML import to orient the view.
Toggle EOV sites	Shows or hides the STM site markers. Useful when the markers obscure paddock boundaries during detailed review.
Sync to plan	Pushes KML-derived data into the planning model. See the Sync

Control	Action
	section below.
Mouse scroll	Zoom in / out.
Click and drag	Pan the map.

Paddock matching

When a KML is imported, each paddock name is compared against the existing planning model using a normalised fuzzy match (lowercase, alphanumeric characters only). For example, "North Flat" and "north-flat" and "NORTHFLAT" all resolve to the same paddock.

The parsed paddock table below the map shows a "Matched" or "New" status for each polygon:

- "Matched" — the KML paddock was linked to an existing record. Sync to plan will update the area and centroid of that record.
- "New" — no match was found. Sync to plan will add a new paddock to the register with default values (quality 75%, EHI null, forage 0 ADA).

Syncing to the plan

The "Sync to plan" button commits KML data to the live planning model. This action:

10. Updates the area (ha) of every matched paddock from the KML polygon geometry
11. Adds centroid coordinates to matched paddocks for use in EOV site proximity matching
12. Adds any new (unmatched) paddocks to the register with default planning values
13. Recalculates total farm area as the sum of all paddock areas
14. Rebuilds the grazing chart with updated paddock rows
15. Recalculates the planning calculator with the new paddock count and areas

Sync is not reversible in this version

Once you sync, the planning model is updated. If you want to review the parsed data before committing, use the paddock table below the map — it shows all data before sync.

Exporting paddock data

The "Export CSV" button on the parsed paddock table downloads a CSV file containing all parsed paddock data: name, area in hectares, centroid latitude and longitude, vertex count, match status, and planning status. This CSV can be used in spreadsheet tools or imported into other systems.

Map data source

The base map tiles are provided by OpenTopoMap (© OpenTopoMap contributors, © OpenStreetMap contributors). OpenTopoMap is chosen for its detailed topographic rendering — contour lines, land-cover shading, and vegetation patterns are directly relevant to grazing management decisions.

No map API key is required. Tiles are loaded from the public OpenTopoMap CDN.

5. Seasonal Planning

Overview

The Planning panel contains three tools: the Plan Calculator, the Destocking Scenario Modeller, and the SAU Calculator. These implement the quantitative mechanics of HPG planning as described in the Savory Institute ebooks and the textbook Holistic Management (Savory & Butterfield, 2016).

5.1 Plan Calculator

The Plan Calculator derives your average grazing period from a recovery period and paddock count. Recovery period is always set first — it is the most important variable in HPG.

Inputs

Input	Guidance
Season	Growing (open plan) or Nongrowing (closed plan). Determines which formula is used.
Number of paddocks	Total paddocks in the grazing unit. More paddocks = shorter average GP = less overgrazing risk.
Recovery period	Days of rest between grazings. Set this first, based on plant growth rate and brittleness.
Number of herds	Normally 1. Multiple herds change the formula. Single herd is always recommended where possible.
Nongrowing season length	Days in the nongrowing season. Used only when Season = Nongrowing.

Formulas used

Growing season — single herd
`GP = RP ÷ (Paddocks − 1)`
Example: 54 ÷ 11 = 4.9 days
Plan your recovery period first, then read off the GP.

Growing season — multiple herds
`GP = RP ÷ (Paddocks / Herds − 1)`
Example: 54 ÷ (12/2 − 1) = 10.8 days
Each additional herd reduces effective paddock count.

Nongrowing season
`GP = NG Days ÷ Paddocks`
Example: 160 ÷ 12 = 13.3 days
Ration forage over the full season to a specific end date.

Outputs and interpretation

Output	Meaning
Average GP	The average number of days in each paddock. This is a target, not a rigid schedule — actual GPs will vary with growth rate.
Graze:recovery ratio	GP expressed as a fraction of RP. A ratio of 1:11 means for every 1 day of grazing, plants get 11 days of recovery.
Overgrazing risk	A qualitative assessment based on the GP. Below 3 days: LOW. 3–7 days: LOW to MODERATE (monitor fast growth closely). 7–14 days: MODERATE. Above 14 days: HIGH — consider splitting paddocks or extending RP.
Recommendation	Text advice calibrated to the current growth rate mode and GP result.

How to use recovery period

Recovery period is the central decision in HPG planning. Use these guidelines:

Condition	Recovery period guidance
Fast growth, non-brittle	20–35 days. Plants recover quickly. Move faster.
Fast growth, brittle (4–6)	35–60 days. Brittle environments need longer recovery even under fast growth.
Slow growth, any environment	60–120 days. Never make faster moves during slow growth — this destroys recovery time across all paddocks.
Nongrowing season	Plan as if it will be a dry year. Set the drought reserve at 1+ months beyond your most pessimistic estimate of when growth will resume.
Rule of thumb	When in doubt, use slow moves. You cannot damage land by giving it

Condition	Recovery period guidance
	too much recovery time.

5.2 Destocking Scenario Modeller

When forage is insufficient to carry the full herd through the season, the model calculates how many animals must be cut under different timing scenarios — demonstrating the core HPG principle that earlier destocking always means fewer animals cut.

Inputs

Input	How to obtain it
Current herd size	Total animals in the grazing unit at the time of assessment.
Days remaining in season	Days until the end of the nongrowing season or the expected start of growth.
Animal-days available (ADs)	Total forage available expressed as animal-days. Assess this using the field square method: pace off a square that one animal would eat in one day, and count how many such squares are in each paddock.
ADs needed at full herd	Herd size × days remaining. If this exceeds ADs available, destocking is required.

Reading the scenarios

The model generates four scenarios: destock immediately, wait 25% of season, wait 50%, wait 75%. For each scenario:

- Number of animals to cut = animals that cannot be sustained with the remaining ADs
- Survivors = animals that can complete the full season on available forage
- Colour coding: green = destock now (fewest cuts), amber = modest delay, red = dangerous delay

The destocking rule

Every week of delay increases the number of animals that must be cut, and reduces the condition of the animals that remain. The tool cannot make this decision for you — but it will always show you the true cost of waiting.

5.3 SAU Calculator

The SAU Calculator converts a mixed herd into Standard Animal Units (SAU), the common currency for comparing forage requirements across species and sizes.

SAU conversion factors

Animal class	SAU factor
Cow, dry (1,000 lb)	0.92 SAU
Cow with calf	1.00 SAU
Bull, mature	1.35 SAU
Cattle, yearling	0.60 SAU
Horse, mature	1.25 SAU
Sheep, mature	0.20 SAU
Lamb, yearling	0.15 SAU
Goat, mature	0.15 SAU
Kid, yearling	0.10 SAU

Enter the count for each animal class. The calculator computes total SAU per class and overall. Use this total in the stocking rate formula:

Stocking rate

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Stocking rate = Total ha ÷ Total SAU
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Example: 200 ha ÷ 186 SAU = 1.08 ha/SAU
Or expressed as SAU/ha: 186 ÷ 200 = 0.93 SAU/ha

6. Grazing Chart

Overview

The Grazing Chart is the operational heart of HPG. It is a day-by-day grid with paddocks as rows and calendar days as columns. Every planned move and every recorded grazing is plotted on this chart. The chart makes immediately visible the relationship between grazing periods and recovery periods, and shows the consequences of any change in the plan.

Reading the chart

Each cell in the chart body represents one paddock on one day. Cell colours indicate:

Cell colour	Meaning
Dark green	Grazing — animals are in or were in this paddock on this day. A filled circle (●) marks confirmed grazing.
Light green	Recovery — paddock is resting. No fill or marker.
Amber	Planned — a future move is scheduled for this cell. A dot (·) marks the planned day.
Red-tinted	Alert — this paddock has been flagged by an EHI concern. The cell is coloured for the duration of the alert period.
Green border	Today — the current calendar date is indicated by a green border on the cell.

Hover over any cell to see the paddock name and date in a tooltip.

Row structure

Each paddock row shows, from left to right:

- Paddock name and area in hectares
- ADA estimate column — the planned forage available from the last assessment
- ADA actual column — the recorded forage consumption after the grazing event
- Day columns for the full season (April–September for the growing season)

The recovery period principle in the chart

The most important rule to understand when reading the chart is:

Recovery period linkage

Every paddock in the rotation shares the same recovery period. If animals leave a paddock one day early, every other paddock in the rotation loses one day of recovery time. If animals leave three paddocks one day early each, all paddocks have lost three days of recovery. This is why the chart shows all paddocks together — so you can see the cumulative effect of any change.

Importing and exporting

The chart header includes Import from CSV and Export buttons. The CSV import accepts a file with the same column structure as the chart: paddock ID, paddock name, area, ADA estimate, ADA actual, and one column per day. The export produces a CSV of the same structure.

This allows the chart to be shared with farm staff, advisors, or the Savory Hub, and to be loaded into spreadsheet tools for further analysis.

Growth rate and the chart

The daily observation rows at the bottom of the chart (accessible via scroll) record:

Row	Purpose
Rainfall (mm)	Daily precipitation. Used to calculate ADA per mm of rainfall — a key long-term productivity indicator.
Growth rate	F (fast), S (slow), or 0 (none/dormant). This is the most important daily observation. It determines whether you should lengthen or shorten the recovery period for the rest of the season.
Supplement	Type and quantity of supplementary feed provided.
Paddocks available	Count of paddocks accessible on that day.
RP min/max	The minimum and maximum recovery period currently in effect.
Avg GP / Max GP	The calculated average and maximum grazing period given the current RP and paddock count.

7. EOV Monitoring — Geodatatrack

Overview

The EOV Monitor panel is the ecological feedback layer of HPG Intelligence. It closes the plan-monitor-control-replan loop by translating Geodatatrack STM field data into management signals. The Ecological Outcome Verification (EOV) protocol was developed by the Savory Institute (Version 3.0, March 2021) in collaboration with soil scientists, ecologists, and agronomists worldwide.

Importing Geodatatrack data

Export your STM session data from Geodatatrack and drop the file on the import zone at the top of the EOV Monitor panel. Accepted formats are CSV and JSON.

16. In Geodatatrack: STM session → Export → select CSV or JSON
17. In HPG Intelligence: EOV Monitor → drag file onto import zone, or click to browse
18. The tool parses indicator scores, GPS coordinates, EHI totals, and forage ADH values for each site

19. The EHI table is populated and the control loop interpretation panel generates management recommendations

Short Term Monitoring indicators

STM assesses 15 ecological indicators at each site in approximately 10 minutes. The Ecological Health Index (EHI) is the sum of all indicator scores, calibrated to your ecoregion reference area.

Indicator reference table

Indicator	Score range	Weight	Type	What it assesses
Bare soil	−20 to +20	×2	Relative	Ground exposed to rain, sun, wind. Double-weighted.
Live canopy	−10 to +10	×1	Relative	Photosynthetic tissue per unit area vs reference.
Living organisms	−10 to +10	×1	Absolute	Dung beetles, insects, spiders, worm casts.
Warm season grasses	−10 to +10	×1	Relative	Vigour, reproduction, crown integrity of key species.
Cool season grasses	−10 to +10	×1	Relative	Vigour, reproduction, crown integrity of key species.
Forbs & legumes	−10 to +10	×1	Relative	Vigour, reproduction, crown integrity of key species.
Shrubs & trees	−10 to +10	×1	Relative	Vigour, reproduction, crown integrity of key species.
Desirable rare species	0 to +10	×1	Relative	Frequency of contextually desirable rare plants.
Undesirable species	−10 to 0	×1	Relative	Frequency of contextually undesirable plants.
Litter abundance	0 to +10	×1	Relative	Dead plant material covering the soil surface.
Litter decomposition	Scored	×1	Absolute	Contact with soil, composting vs mulching.
Dung decomposition	0 to +10	×1	Absolute	Speed of disappearance — indicator of mineral cycle.
Capping	−10 to 0	×1	Absolute	Soil surface crust hardness — reduces infiltration.
Wind erosion	−20 to 0	×1	Absolute	Blowouts, deflation patterns, deposition features.
Water erosion	−20 to 0	×1	Absolute	Rills, pedestals, gullies, terracettes.

The EHI score and trend

The EHI is not an absolute number — it is meaningful relative to your ecoregion baseline. What matters most is the direction of travel over time:

EHI trend	Response
EHI increasing year-on-year	Land is regenerating. Continue current management. Explore whether stocking or recovery periods can be optimised.
EHI stable	Land is not declining but not regenerating. Review individual indicator scores to find the weak links.
EHI declining one year	Warning. Check bare soil trend and functional group scores. Was there a weather event or management deviation?
EHI declining two consecutive years	Mandatory replan trigger. Run the context checks on your current management approach.
EHI crash (>15 points decline)	Emergency. Amalgamate herds, extend recovery periods immediately, assess destocking.

Control loop interpretation

The control loop panel below the STM table translates indicator data into specific management recommendations. Each recommendation:

- Names the indicator and site that triggered it
- Cites the relevant HPG principle (cause-and-effect, weak link, etc.)
- Proposes a specific control action: extend RP, apply herd effect, adjust GP
- Distinguishes between a control action (minor adjustment, no replan) and a replan trigger

Forage quality scores

The comprehensive STM includes a forage quality visual assessment at each site. Scores range from 1 (old dead material, <40% digestibility) to 5 (100% green leaves with legumes, >70% digestibility). These scores feed directly into the advisor's recommendations on grazing sequence and supplementation.

Score	Animal performance expectation
Score 5	>70% digestibility, >16% protein. Maximum individual performance. Both adult and young animals gain well.
Score 4	60–70% digestibility, 12–16% protein. High intake. Adults and young gain weight.

Score	Animal performance expectation
Score 3	50–60% digestibility, 8–12% protein. Adults may gain modestly. Young may maintain only.
Score 2	40–50% digestibility, 4–8% protein. Intake restricted. Both adult and young lose weight.
Score 1	<40% digestibility, <4% protein. Heavy intake restriction. Animals lose weight fast.

Long Term Monitoring

LTM is conducted at baseline and every 5 years by an accredited EOV Monitor. LTM results appear in the trends section and validate whether STM improvements are producing real lagging indicator gains:

- Soil carbon content and stocks (0–30 cm depth, Walkley-Black method)
- Soil health (Haney test or Cornell CASH test — microbial activity, water-extractable organic carbon and nitrogen)
- Water infiltration rate (NRCS 1999 protocol)
- Species richness and Shannon-Wiener diversity index
- Botanical composition by functional group

8. HPG Advisor

Overview

The HPG Advisor is an AI-powered conversational assistant that answers questions about your plan, EOV data, and any HPG decision. It is grounded in the Savory Institute Holistic Management framework and operates with the current farm data — paddock states, EHI scores, recovery period, growth rate — embedded in every response.

How it works

Every message you send to the Advisor includes:

- Your current farm context: paddock count, total area, ecoregion, recovery period, growth rate, total SAU, current EHI and baseline EHI

- The HPG framework system prompt: key principles on overgrazing as a time function, recovery period primacy, the cumulative effect of early moves, EHI alert thresholds, and the 7 context checks
- The last 6 messages in the conversation (for continuity)

The Advisor's responses are generated by Claude (Anthropic's AI) via a secure serverless function — your farm data and API key never leave the server.

What to ask

The Advisor is most useful for:

Topic	Example questions
Recovery period decisions	"Should I extend the recovery period given slow growth?" "Is 54 days long enough for brittleness 5?"
EHI interpretation	"What does the bare soil score at site 4 mean for my plan?" "How serious is a 4-point EHI drop?"
Control vs replan	"Three paddocks moved early — should I replan or just adjust?" "How do I restore recovery time?"
Destocking	"Model a destocking scenario for 60,000 ADs over 160 days." "When is the right time to sell?"
Context checks	"Run the context checks on increasing stocking rate by 15%."
Herd management	"Should I amalgamate two herds given the drought?" "What are the benefits of a single herd?"
EOV actions	"Site 4 has 38% bare soil. What do I do?" "Is partial rest or overgrazing more likely causing this?"
HPG principles	"Explain the graze:recovery ratio." "Why does more paddocks help even if total area is the same?"

Limitations

The Advisor reasons from the HPG framework and your farm data, but it cannot:

- Observe your land. It relies entirely on the data you have entered or imported.
- Make decisions for you. It will provide analysis and options, but the decision always requires your on-the-ground judgement.
- Access external databases, weather services, or market prices.
- Replace a trained Savory accredited professional for complex situations.

If the Advisor gives an unexpected answer

Check that your farm data is current — especially the recovery period, growth rate, and EHI scores. The Advisor uses these figures to calibrate its responses. If figures are stale or default sample data, the advice will reflect that context.

9. Holistic Context Checks

Overview

The Context Checks panel implements the seven decision checks from Holistic Management (Savory & Butterfield, 2016, Part 6). These checks are applied to any proposed action before implementing it — not to judge the action as right or wrong, but to surface unintended consequences and ensure alignment with your holistic context.

The seven checks

The checks are applied in any order, with one exception: the gut feel check always comes last.

Check	The question it asks
1. Cause and effect	Does this action address the root cause of the problem, not just the symptom? Ask "why" at least five times before accepting the first answer.
2. Weak link — social	Could this action create resistance from people whose support matters? Identify and address any social blockage before it becomes a barrier.
3. Weak link — biological	Does this action target the organism's most vulnerable point in its life cycle? For plants, that is usually at germination and early establishment.
4. Weak link — financial	Does this action strengthen the weakest link in your chain of production? Investing elsewhere first may be more effective.
5. Marginal reaction	Which action provides the greatest return toward your goal for each additional unit of money or time invested?
6. Gross profit	Which enterprise contributes most to covering overheads and generating profit? Calculate gross profit (revenue minus direct costs) before committing.
7. Energy/money sustainability	Is the energy or money used in this action from an appropriate source? Will the action lead toward or away from the future resource base described in your holistic context?
Gut feel (always last)	After passing all applicable checks, does this action still feel right in

Check	The question it asks
	the context of your holistic context? If something feels wrong, it usually is.

Using the panel

Type or paste a description of the proposed action into the input field and click "Run context checks." The panel will score each check (pass, fail, or not applicable) and provide a brief explanation for each result.

The scoring is based on pattern matching and the HPG knowledge base — it is not infallible. Use the results as a structured prompt for your own thinking, not as a definitive judgement.

Common patterns

Certain types of action tend to fail specific checks:

Proposed action	Typical failures
Increasing stocking rate	Typically fails cause-and-effect (overgrazing is time, not numbers), sustainability (moves away from future resource base), and often gross profit (diminishing returns on forage quality).
Reducing paddock count	Fails cause-and-effect and sustainability. More paddocks always improve timing flexibility.
Area-based drought reserve	Fails cause-and-effect and sustainability. Time-based reserves (animal-days) are always superior.
Multiple herds	Fails marginal reaction and gross profit. Each additional herd carries hidden costs in profitability and land improvement rate.
Faster moves during slow growth	Fails cause-and-effect. Faster moves during slow growth periods destroy recovery time across all paddocks.

10. HPG Formulas Reference

All formulas used in the tool

Animal Days per Acre / Hectare (ADA / ADH)

ADA = Animals × Days ÷ Acres ADH = Animals × Days ÷ Hectares

Example: 200 animals × 4.9 days ÷ 16.3 ha = 60.1 ADH

The volume of forage removed from an area. Used to assess paddock productivity and carry capacity.

Average Grazing Period — growing season, single herd

GP = RP ÷ (Paddocks − 1)

Example: 54 ÷ (12 − 1) = 4.9 days

Recovery period is set first. GP derives from it.

Average Grazing Period — growing season, multiple herds

GP = RP ÷ (Paddocks / Herds − 1)

Example: 54 ÷ (12/2 − 1) = 10.8 days

Each additional herd effectively halves the available paddock count.

Average Grazing Period — nongrowing season

GP = NG Days ÷ Paddocks

Example: 160 ÷ 12 = 13.3 days

Ration forage over the closed season to a specific end date.

Follow-through grazing (two herds)

GP = RP ÷ (Paddocks − Number of Herds)

Example: 54 ÷ (12 − 2) = 5.4 days

Where the second herd follows the first through the same paddock sequence.

Stock density

Stock density = Animals ÷ Paddock ha

Example: 200 ÷ 16.3 = 12.3 animals/ha

The density of animals on a given paddock at a given moment. Not the same as stocking rate.

Stocking rate

Stocking rate = Total ha ÷ Total animals

Example: 200 ha ÷ 200 animals = 1.0 ha/animal

The area of the whole grazing unit per animal. Does not change with paddock number.

Primary productivity

PP = ADH at end of season + ADH consumed since season start

Example: ADH remaining: 100 + ADH consumed: 2×50 = 200 ADH

A measure of how much the land produced over the growing season. Track year-on-year.

Herd size adjustment factor

Adjustment = Average SAU ÷ Actual SAU

Example: 186 avg ÷ 200 actual = 0.93

Multiply actual GP by this factor when herd size changes significantly during the season.

Field animal-day square (forage assessment)

```
Side = √(sq yards per acre ÷ ADA)
```

Example: ADA 60: side = √(4840/60) = 8.98 yards ≈ 9 yards square

Pace off this square in the paddock. One animal should be able to eat the forage in that square in one day.

EOV indicator scoring reference

Condition	EHI score impact
Bare soil 0–20%	+20 (maximum positive) for near-zero bare soil in the context of your ecoregion.
Bare soil 20–30%	0 to +10 depending on ecoregion baseline.
Bare soil 30–50%	−10 to 0. Cause-and-effect investigation required.
Bare soil >50%	−20 (maximum negative). Emergency. All four ecosystem processes impaired.
Functional group — thriving	+10 to +5. Key species present with good vigour, reproduction, crown integrity.
Functional group — declining	−5 to −10. Key species absent or losing plants.
Dung decomposition — fast	+10. Livestock present within the year and dung has disappeared quickly.
Dung decomposition — mummified	0. White, floating, odourless dung pats indicate very slow mineral cycling.
Capping — none	0. Loose soil. No pressure needed to penetrate.
Capping — hard	−10. Metallic tool required to break crust.
Wind erosion — none	0.
Wind erosion — generalised	−20. Connected deflation/deposition patterns across the site.

11. Deploying on Netlify

Project structure

The tool is distributed as three files:

File	Purpose
index.html	The entire application. A single self-contained HTML file with all CSS, JavaScript, and logic.
netlify.toml	Netlify configuration: build settings, redirect rules (/api/chat → /.netlify/functions/chat), and security headers.
netlify/functions/chat.mjs	Serverless Edge Function that proxies requests to the Anthropic API. Reads the API key from the Netlify environment — the key is never exposed to the browser.

A fourth file, .nvmrc containing "20", should be added to the project root to pin the Node.js version for the serverless function.

Environment variables

One environment variable is required:

Variable	Purpose
ANTHROPIC_API_KEY	Required. Your Anthropic API key from console.anthropic.com. Used by the serverless function to call the Claude API. Never add this to index.html directly.

Add it in Netlify: Site configuration → Environment variables → Add variable. Redeploy after adding.

Deployment methods

Option A — Drag and drop (quickest)

20. Go to app.netlify.com → Add new site → Deploy manually
21. Drag the project folder (containing all three files) onto the deploy zone
22. Once deployed: Site configuration → Environment variables → add ANTHROPIC_API_KEY
23. Deploys → Trigger deploy to redeploy with the key active

Option B — GitHub + Netlify CI (recommended)

24. Push the project to a GitHub repository
25. Netlify → Add new site → Import from Git → connect your repository
26. Build settings are auto-detected from netlify.toml
27. Add ANTHROPIC_API_KEY in Site configuration → Environment variables
28. Every push to the main branch will auto-deploy

Option C — Netlify CLI

`npm install -g netlify-cli` then:

```
netlify login
netlify init
netlify env:set ANTHROPIC_API_KEY your-key-here
netlify deploy --prod
```

Adding Geodatatrack API integration

When Geodatatrack provides API credentials, the integration pattern is identical to the Anthropic proxy:

29. Add GEODATATRACK_API_KEY and GEODATATRACK_BASE_URL as Netlify environment variables
30. Create netlify/functions/geodatatrack.mjs following the same pattern as chat.mjs
31. Call /api/geodatatrack from the EOV panel in index.html

Both API keys remain server-side. The browser never has direct access to either.

12. Troubleshooting

Problem	Solution
HPG Advisor shows no response	Check that ANTHROPIC_API_KEY is set in Netlify environment variables and the site has been redeployed after setting it. The advisor falls back to pre-written responses if the API call fails.
KML import: "No Polygon placemarks found"	The KML file contains only Point or LineString features. In Geodatatrack, ensure paddocks are drawn as polygon areas before exporting.
KML import: paddock areas look wrong	The spherical area calculation uses WGS84 coordinates. Verify the KML is in geographic coordinates (decimal degrees), not a projected coordinate system (metres).
Paddock names show "New" instead of "Matched"	The KML paddock name does not match the planning model name after normalisation. Check for spelling differences. The match is case-insensitive and strips non-alphanumeric characters.
Map tiles not loading	OpenTopoMap requires an internet connection. The map will not function offline. Ensure the browser is not blocking external tile

Problem	Solution
	requests.
EHI score not updating after import	The EOV import currently accepts Geodatatrack CSV/JSON format. Verify the file structure matches what Geodatatrack exports for STM sessions.
Grazing chart shows only sample data	The chart populates from FARM_DATA.paddocks in the JavaScript. Import a KML and use "Sync to plan" to replace sample paddocks with your own.
Context checks always show the same results	The context check scoring is keyword-based. Describe your action in specific terms (e.g., "extend recovery period from 54 to 70 days") rather than general terms.
Planning calculator shows unexpected GP	Check that "Number of paddocks" reflects the actual paddock count after any KML sync, and that "Number of herds" is set correctly.
Page is blank after opening index.html	Some browsers restrict local file access for JavaScript. Use a local server (e.g., python3 -m http.server) or deploy to Netlify.

13. Glossary

Key terms used in HPG Intelligence and the Holistic Management framework.

Term	Definition
ADA	Animal Days per Acre. Volume of forage taken from one acre in a given time. ADA = Animals × Days ÷ Acres.
ADH	Animal Days per Hectare. As ADA but using hectares as the area unit.
AD	Animal Day (singular). The amount one standard animal eats in one day. The basic unit of forage measurement.
Aide memoire	A structured planning sequence, adapted from Sandhurst military planning procedure, that leads the manager through seasonal plan creation step by step.
Biological decay	The breakdown of plant material by soil organisms (bacteria, fungi, dung beetles, earthworms). Contrasted with oxidation — the slow chemical breakdown that dominates in brittle environments.
Brittleness scale	A scale from 1 (non-brittle) to 10 (very brittle) describing how effectively rainfall is retained and how well biological decay functions in an environment.
Community dynamics	One of the four ecosystem processes. The ever-changing composition and structure of biological communities — from soil microbes to large animals.

Term	Definition
Crown integrity	The health of the basal crown of a grass plant. An intact, living crown across its full width indicates good plant health. A crown dying from the centre outward indicates overrest.
EHI	Ecological Health Index. The sum of all STM indicator scores, calibrated to a reference area in the ecoregion. Ranges from large negative to large positive depending on the ecoregion scorecard.
Energy flow	One of the four ecosystem processes. The capture of solar energy by plants and its movement through the food chain and decomposers.
EOV	Ecological Outcome Verification. The Savory Institute monitoring protocol that provides empirical, outcome-based verification of land regeneration.
Forage quality score	A visual score from 1 to 5 assessing the digestibility and protein content of forage at an STM site. Score 5 = >70% digestibility, >16% protein.
Functional group (FG)	A category of plants grouped by their ecological role and structural similarity. The four main FGs in EOV are: warm season grasses, cool season grasses, forbs and legumes, shrubs and trees.
GP	Grazing Period. The number of days animals spend in one paddock before moving. Derived from the recovery period: GP = RP ÷ (paddocks − 1).
Graze:recovery ratio	The ratio of grazing period to recovery period. A ratio of 1:11 means 1 day of grazing per 11 days of recovery.
Herd effect	The physical impact on soil and vegetation produced by a large herd of excited, bunched animals. Distinct from stock density — herd effect requires behavioural change (bunching, milling) and is non-linear with herd size.
Holistic context	The overarching framework for decision-making, comprising a quality of life statement and a future resource base description. All decisions are checked against the holistic context.
KML	Keyhole Markup Language. An XML-based file format for geographic data used by Google Earth and Geodatatrack. Paddocks drawn as Polygon placemarks in Geodatatrack are exported as KML for import into HPG Intelligence.
LTM	Long Term Monitoring. EOV monitoring conducted at baseline and every 5 years, assessing lagging indicators: soil carbon, water infiltration, species diversity.
Mineral cycle	One of the four ecosystem processes. The circulation of nutrients from soil through plants, animals, and decomposers and back to soil.
Overgrazing	Grazing that occurs when a plant bitten severely while growing is bitten again before its roots have recovered. A function of time, not animal numbers.
Overrest (partial rest)	The condition of soil and plants that have been insufficiently disturbed by large animals. In brittle environments, partial rest causes organic

Term	Definition
	matter to oxidise rather than decompose biologically, resulting in dying grass and exposed soil.
Primary productivity	Total forage produced in a growing season. Calculated as: ADH at end of season + ADH consumed since season start.
Recovery period (RP)	The minimum time a paddock must rest between grazings for plants to recover roots and leaf. The most important variable in HPG planning.
Reference area	The best-known expression of biodiversity, site stability, and ecosystem function for a desired state in a given ecoregion. Used to calibrate the EOV evaluation matrix.
SAU	Standard Animal Unit. A common measure of forage demand across different animal species and sizes. A 1,000 lb dry cow = 1.0 SAU.
Stock density	The number of animals on a defined paddock at a given moment. Different from stocking rate.
Stocking rate	The area of the whole grazing unit per animal (or animals per unit area). Does not change when paddocks are subdivided.
STM	Short Term Monitoring. Annual EOV field assessment of 15 leading ecological indicators at ≥10 sites, giving an EHI score that can be used for management decisions within the same season.
Water cycle	One of the four ecosystem processes. The effectiveness with which rainfall is captured, infiltrated, stored, and used by living organisms rather than lost to runoff or evaporation.