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CHAPTER 1
EOV SUMMARY

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Savory

Ecological Outcome Verification Overview

Ecological Outcome Verification (EOV) is the "science inside" Savory Institute's Land to Market program. Land to Market (L2M) is a sourcing solution that connects conscientious buyers, brands and retailers directly to farms and ranches that are verified to be regenerating their land. EOV is the empirically based protocol used to verify farms and ranches to be eligible to participate in the L2M program.

EOV was developed in collaboration with leading soil scientists, ecologists, agronomists, and an extensive network of regenerative land managers around the world. EOV is a practical and scalable soil and landscape assessment methodology that tracks outcomes in biodiversity, soil health, and ecosystem function (water cycle, mineral cycle, energy flow and community dynamics). EOV applies to grassland environments, including natural and planted grasslands, as well as grassland mixed with crop and/or forest areas. Farms and ranches demonstrating positively trending outcomes in land regeneration through EOV are eligible to be entered into a "Verified Regenerative Supplier Roster", from which participating buyers, brands, retailers and end consumers can access products or services that have been produced on a verified regenerative land base.

LAND TO MARKET OFFERS A FULL CIRCLE SOLUTION FOR REGENERATIVE SOURCING

EOV Ethos

EOV is designed to reflect the Savory Institute's enduring commitment to farmer education, support, and continuous improvement in community with their peers and with respect for their given context. It is therefore designed according to the following strategic pillars:

Outcome Based

Many certification schemes are process based and simply inventory farmer practices. The problem is that the use of practices or tools does not guarantee that regeneration will take place. Outcomes depend on how practices and tools are managed. Concurrently, that management depends on contextual variances in cultural, environmental, and economic conditions. EOV provides empirical and tangible outcomes, which in turn inform the farmer with ongoing feedback from which to make better management decisions. EOV measures and trends key indicators of ecosystem function, which in the aggregate indicate positive or negative trends in the overall health of a landscape. In addition to providing an outcome-based verification of the health of the land base, EOV also provides critical data to the farmer as a steward and manager of the land. By recognizing both land regeneration targets and trends, a farm or ranch is eligible for EOV verification and associated incentives as long as land health moves in a net positive direction.

Contextually Relevant

EOV is not a one-size-fits-all metric. Each EOV evaluation is contextualized within its given ecoregion. Each ecoregion contains its own biodiversity of flora and fauna and has unique characteristics such as climate, geology, biodiversity and soil types.

Within an Ecoregion, reference areas are identified based on a desirable state demonstrating higher biodiversity, resilience, and ecosystem function effectiveness.

Reference areas are used with a State and Transitions catalogue, which lists the variety of soils and vegetation in each ecoregion, to develop an evaluation matrix of ecological health indicators. This matrix is then used to verify the land health of a farm or ranch. Farms and ranches within that ecoregion are then benchmarked against that reference area,

allowing managers to better understand the potential of their own property within the operating conditions of their unique context.

Farmer First

EOV is not a top-down assessment tool. It is designed to be a non-punitive learning mechanism for continuous land improvement, ongoing peer support for land managers and marketplace differentiation.

Photo credit BTBETTY

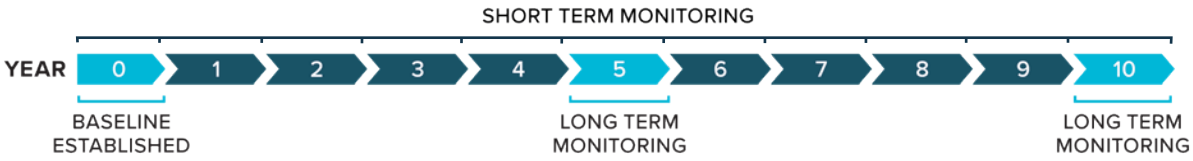
EOV is implemented by Savory's global Network of regional Hubs, who work closely with land managers in their given geographical areas. Savory accredited verifiers and monitors are therefore deeply knowledgeable of the local ecology. Furthermore, they are well versed in local operating conditions and management approaches. Those land managers seeking training, coaching and implementation support in order to improve the ecological outcomes on their land can contact their regional Savory Hub.

Photo credit BTBETTY

EOV Metrics Summary

Farms are set up with EOV using satellite mapping. A farm monitoring plan will combine Short Term monitoring (STM) sites, distributed extensively throughout the farm, with permanent Long Term monitoring (LTM) transects (including photopoints) located on representative areas of the farm or ranch. Both monitoring procedures are linked by the Ecological Health Index, calculated using the Evaluation Matrix for the associated Ecoregion.

STM occurs every year of participation in the program. LTM visits occur in year 0 (the baseline assessment), year 5 and then every 5 years thereafter.



STM criteria is comprised of “leading” indicators of ecological health that have predictive value about the direction of changes. Evaluating leading indicators is very useful for docu-

changes and informing management. STM indicators were selected from Allan Savory`s work and many important references in the scientific literature. They include:

- Live canopy abundance
- Living organisms
- Vigor and reproduction of contextually desirable functional groups
  - Warm season grasses
  - Cool season grasses
  - Forbs and legumes
  - Trees and shrubs
- Contextually desirable species
- Contextually undesirable species
- Plant litter
- Litter decomposition
- Dung decomposition
- Bare ground
- Soil capping
- Wind erosion
- Water erosion

LTM criteria are comprised of all the STM criteria listed above, plus a suite of "lagging" indicators for land regeneration such as canopy cover by species and functional groups, biodiversity indicators, water infiltration, soil carbon, and soil health. All these indicators are measured using acknowledged scientific methodologies. Unlike leading indicators, lagging indicator values provide little opportunity for speedy management corrections. However, lagging indicators do provide strong scientific validation of the relationship between leading indicators and the function of the ecosystem processes. The EOV protocol seeks an adequate balance between both leading indicators, which are highly useful to farmers, and lagging indicators, which are more useful for scientists, secondary markets and brands. A balanced combination of both monitoring procedures is a practical, cost effective way of verifying land management outcomes as a whole.

The EOV will document the dynamic aspects of soil health that are dependent on soils' inherent properties as well as the influence that land use and management can have over time. Additional soil health protocols may be added as local context allows.

Techniques and protocols for measuring some of these lagging indicators may be adjusted to accommodate the contextual resource availability—for example, access to labs for sample analysis. In these cases, and when vetted by the Savory Institute Quality Assurance team, the EOV protocol will allow for more relevant methods to be used. The data will be analyzed, and correlations established using the global aggregated data. This will allow for proactive measurement and learning as the protocol and new technologies evolve.

EOV Onboarding Process

In order receive Ecological Outcome Verification, and participate in the Verified Regenerative Supplier Roster of Savory Institute's Land to Market program, a producer, farmer, rancher or supplier follows these steps:

START

Contact the Savory Institute via our website (savory.global) or contact your regional Hub. Regional Hubs can be located on the Savory website.

BASELINE

Regional Hub Verifier schedules a farm visit, prepares farm mapping and creates a STM plan. Using STM data, the verifier finalizes the farm monitoring plan by locating where to establish LTM sites. LTM data is then collected. The combination of the initial STM and LTM data provide a baseline.

EVERY YEAR

A Regional accredited monitor visits the farm to conduct the annual STM. If results trend positive in the context of the ecoregion, Verification is granted/renewed and the farm is entered into the Land to Market Verified Regenerative Supplier Roster. Farmers can undergo training and accreditation by the local Hub Verifier to conduct the STM on their own and other local farms.

YEARS 5 & SUBSEQUENT 5-YEAR INTERVALS

On a five year interval a Regional Hub Verifier returns to the farm to conduct LTM. If data confirms STM positive trends, Verification is granted/renewed and farm remains on the Land to Market Verified Regenerative Supplier Roster.

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EOV IMPLEMENTATION

1 Part 1: Ecoregion Set-Up

Performed by Master Verifiers with Accredited Hub Verifiers

ECOREGION SET UP INCLUDES THE FOLLOWING FOUR STEPS:

A. Ecoregion

B. States, Functional Groups, Transitions, and Tools

C. Reference Areas

D. Evaluation Matrix

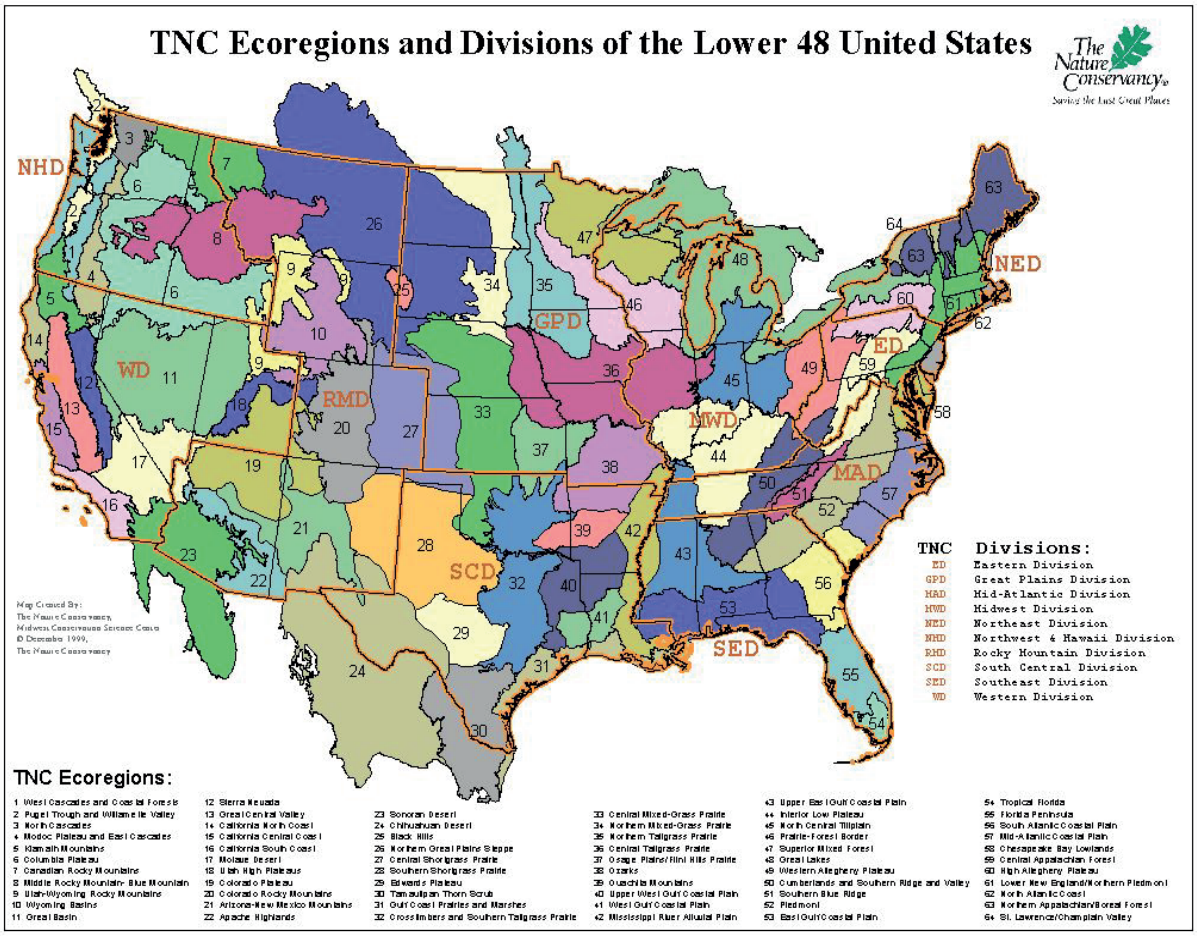
2 Part 2: On-Farm Monitoring

3 Part 3: Regional & Global Quality Assurance

A. ECOLOGICAL REGIONS (ECOREGIONS)

The areas covered by EOV will be separated into broad ecological regions, defined as areas that contain characteristic, geographically-distinct, assemblages of natural communities and species. The diversity of flora and fauna that characterize one ecological region tends to be distinct from that of other ecological regions. Ecological regions are the result of climate, geology, and landforms. They have a defined degree of brittleness and therefore have differential responses to management tools. To make comparisons between operations, differences between ecoregions must be taken into account. The ecological region is selected based on an ecological map that is widely accepted in the scientific literature. In the United States, Hub Verifiers use The Nature Conservancy's Ecoregions. Ecoregion maps on a global basis are coordinated by the Savory Institute Quality Assurance team.

EXAMPLES OF ECOREGION MAPS



Example of Ecological Regions in USA. Credit: The Nature Conservancy

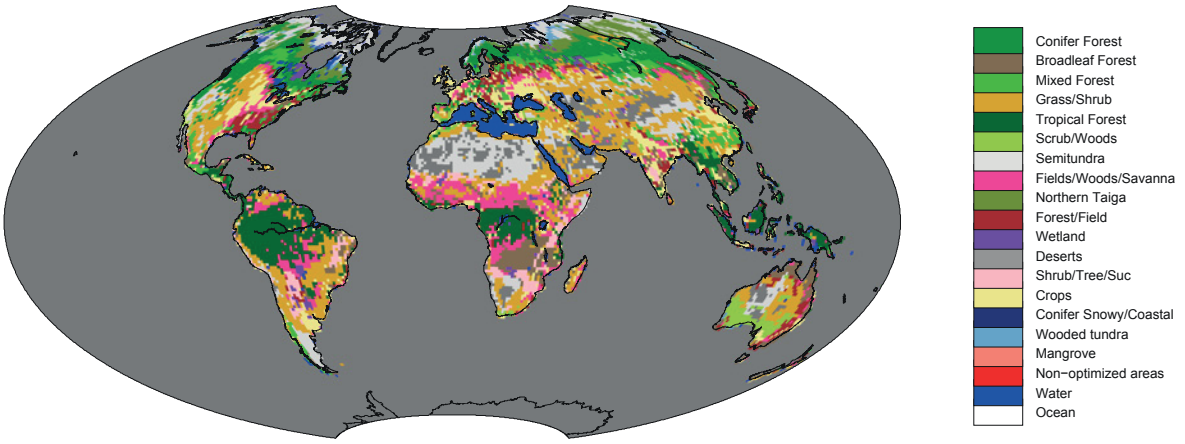


Image source: www.noaa.org

B. STATES, FUNCTIONAL GROUPS, TRANSITIONS, AND TOOLS

After the ecoregion has been defined, the Hub Verifier seeks to understand each region's uniqueness and human influence through past management. This information is necessary to assess the functioning of the ecological region and to recognize the challenges for regeneration of grasslands and biodiversity. The Hub Verifier will review the literature to see if there are previous publications on this ecoregion that describe the state of the vegetation (old growth or young forest, brush or perennial or annual grassland, etc) within it and past management practices and:

A. Define/revise states in the ecoregion

B. Define/revise which functional groups of perennial plants are relevant for each state in the ecoregion. Groups that need to be considered include:

   Warm season grasses

   Cool season grasses

   Forbs/Legumes

   Contextually desirable shrubs and trees

   Contextually desirable rare species (not endangered)

   Contextually undesirable species

C. Define/revise possible transitions between the states in the ecoregion. For example, a transition from brush to grass, or annual to perennial grassland.

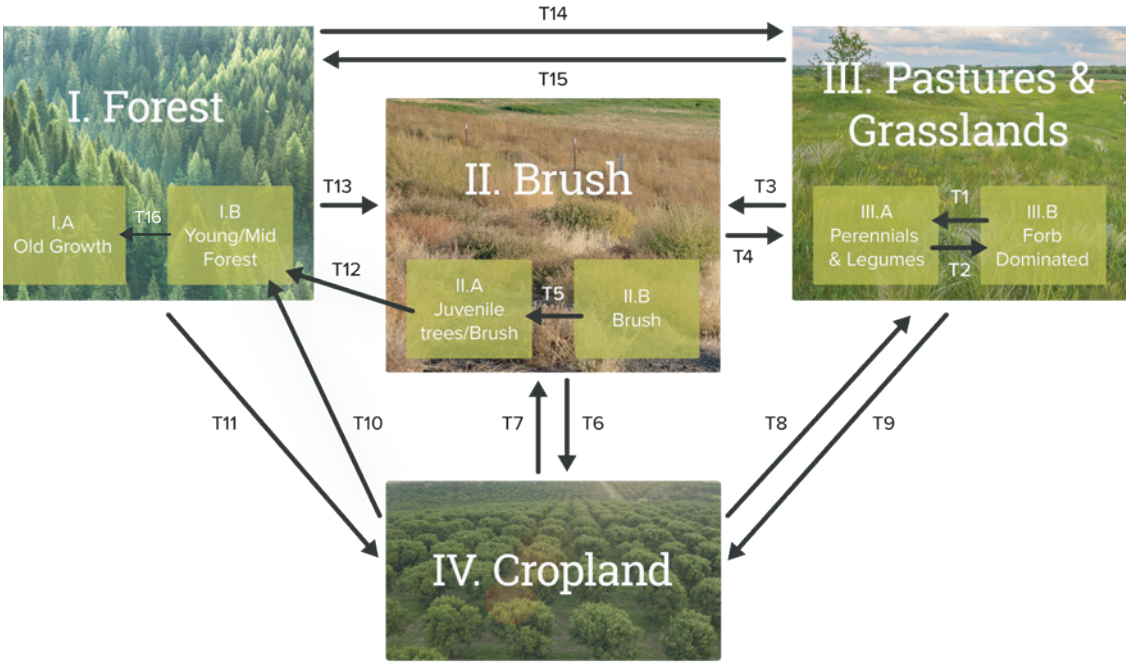
D. Define/revise how tools promote transitions between states in the ecoregion.

The State and Transition Catalogue summarizes the possible states of vegetation, functional groups of plants in each state, possible transitions between states, and the tools/practices/events that promote a transition from one state to another for the ecoregion.

The State and Transition Catalogue that follows shows the various States for an Ecoregion and the Transitions with corresponding tools/events to promote a change between states.

In many cases there will not be any previous publications on a given ecoregion. In that case research must be done in order to determine the characteristics needed to develop a State and Transitions Catalogue. Universities, government agencies, and non-government organizations are all good sources for the needed information to develop a States and Transitions Catalogue.

SIMPLIFIED STATE & TRANSITION MODEL



T1. Holistic Planned Grazing, animal impact, herd effect, technology.
T2. Partial rest or overgrazing of perennials
T3. Rest, Partial Rest or over grazing of perennials, repeated fires
T4. Animals such as goats to manage brush, Holistic Planned Grazing, animal impact, herd effect, technology, hand and machinery clearing, Labor & Money, and Human Creativity
T5. Rest, partial rest
T6. Technology/clearing/cultivation, Labor & Money, and Human Creativity
T7. Total Rest, Partial Rest
T8. Holistic Planned Grazing, animal impact, herd effect, technology.
T9. Technology/clearing/cultivation, Labor & Money, and Human Creativity
T10. Technology/planting, Labor & Money, and Human Creativity
T11. Technology/logging/cultivation, Fire, Labor & Money, and Human Creativity
T12. Rest
T13. Technology/logging/planting, Fire, Labor & Money, and Human Creativity
T14. Technology/logging/cultivation, Fire, Labor & Money, and Human Creativity,
Holistic Planned Grazing, animal impact, herd effect
T15. Technology/planting, Labor & Money, and Human Creativity
T16. Rest

C. REFERENCE AREAS

Reference areas are the best-known expression of biodiversity, site stability, and ecosystem function for a specific vegetative state in a given ecoregion. Reference areas are the closest example of the desired future landscape in a particular environment for a given context. However, the concept of reference areas is dynamic, as proper management of land bases can generate new reference areas and change the boundaries of what can be achieved. The concept of Reference Areas relates to how well ecosystem processes are functioning, and has a clear difference with the concept of long term exclosures that have been considerd reference areas in the past. Consequently, most of the reference areas are located in managed land. Reference areas are established to create a benchmark and are used to develop an Evaluation Matrix of leading ecological indicators for the specific ecoregion. They are located in relevant states of an ecoregion using local knowledge, satellite imagery, information from scientific advisors, practical experience, and visual appraisal. A LTM site will be installed at each Reference area and analyzed according to EOV LTM Protocols.

D. EVALUATION MATRIX FOR ECOLOGICAL HEALTH INDEX (EHI)

The Evaluation Matrix is a contextually relevant set of leading ecological indicators. Farms and ranches in the ecological region are monitored using the Evaluation Matrix and receive an Ecological Health Index (EHI) score that is calibrated to the ecoregion. The EHI score serves as an aggregated measure of ecosystem health. It is based on ecological indicators associated with the four ecosystem processes – water cycle, mineral cycle, energy flow, and community dynamics. The indicator descriptions on the Evaluation Matrix are adjusted for the characteristics of each ecoregion.

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EOV IMPLEMENTATION

1 ## Part 1: Ecoregion Set-Up

2 ## Part 2: On-Farm Monitoring

Performed by Accredited Hub Verifiers and Accredited Monitors

ON-FARM MONITORING INCLUDES THE FOLLOWING FIVE STEPS:

A. Land Base Mapping

B. Farm Monitoring Plan

C. Short Term Ecological Monitoring / Ecological Health Index (EHI)

D. Long Term Ecological Monitoring

   1. Evaluating Long Term Ecological Monitoring Site—Plants and Soil Surface

   2. Evaluating Long Term Ecological Monitoring Site—Soil Health

E. Data Processing and Reporting

3 ## Part 3: Regional & Global Quality Assurance

A. LAND BASED MAPPING

Mapping is an essential first step in the monitoring process to 1) assist in planning of Short and Long Term ecological monitoring, 2) assess resources under management, and 3) identify vegetative states and quantify their area. Mapping can be done using online resources (e.g. Google Earth) or using digital processing software on satellite imagery. All maps should include the following:

A. Houses, facilities, useful reference points, roads, water sources, directional arrows

B. Paddock information including fences, gates, and paddock names/codes

C. Vegetation types and location of various states for ecoregion

D. Once selected, potential STM sites must be identified on maps.

This is done by the Savory Hub Verifier in collaboration with the farmer.

B. FARM MONITORING PLAN

A farm monitoring plan determines the number and location of both STM and LTM sites. This plan is designed by the Hub Verifier with the farmer to ensure monitoring sites are good representation of the predominant ecological characteristics of the land base.

1. Short Term Monitoring Sites

STM requires observation during the grazing season across each paddock at multiple STM sites. Multiple STM sites (minimum 10) are established and observed varying with the size and heterogeneity of the land base. The number and location of these sites is determined by the Hub Verifier in collaboration with the farmer. At each site, an aggregate of leading ecological indicators is evaluated every year. The monitor will follow the Evaluation Matrix that has been calibrated to the ecoregion by the Hub Verifier when analyzing the ecological indicators. This provides a statistically robust set of data points that represent the overall trend of leading indicators in a land base, informing management and allowing for proactive adjustments if needed. The Hub Verifier uses the EHI score (the mean of all of the STM site scores) to select a LTM site.

2. Long Term Monitoring Sites -

A minimum of three LTM sites are required on each farm or land base. This number increases according to the total area. The Hub Verifier will define the number, type, and location of LTM sites according to the size and heterogeneity of the land base.

The LTM sites on a given farm or ranch shall be areas representative of the land base and reflect the predominant condition. LTM sites provide objective, statistically robust data, and are composed largely of lagging indicators.

C. SHORT TERM ECOLOGICAL MONITORING / ECOLOGICAL HEALTH INDEX (EHI)

STM focuses on leading indicators across the land base and gives the necessary information to inform management adjustments and verify ecological health trends on an annual basis. STM is designed to be simple, inexpensive, and quick while being scientifically robust. This is for it to be effective in portraying the state of the land base and allowing for frequent observations.

Photo credit BTBETTY

Each STM site is analyzed by assessing the leading indicators on the Ecological Health Matrix. The accredited monitor walks the land base, preferably with the farmer, and works through the indicators comparing visual observation with the leading indicators on the Evaluation Matrix. This evaluation is easy to learn and only requires about ten minutes per checkpoint. Producers and professionals can learn to conduct STM in a three-day training that results in reliable EHI scores.

The Ecological Health Index (EHI score) is the sum of the scores for each indicator. The final score is dependent on the Evaluation Matrix for a given ecoregion. Typically, the final score may range between -120 and +120 points.

Ecological Health Index

The Ecological Health Index score provides information regarding the current state of the land base in relation to the desired future land base as expressed by the reference area. Landscape function indexes can be derived from the individual leading indicator scores to evaluate the water cycle, mineral cycle, energy flow, and community dynamics of that land base.

Basic STM will focus only on the Ecological Health Index across the farm. Optionally, a Full STM procedure includes forage quantity and quality assessment, as a routine practice to inform stocking rate decisions and non-growing season grazing planning. Total amount of animal-days or forage availability at the end of the growing season is a key performance indicator of both regeneration, as it correlates with forage productivity, and animal production, as more forage allows higher stocking rates and higher individual performance.

D. LONG TERM ECOLOGICAL MONITORING

Long term monitoring begins with the gathering of baseline data, and is then repeated every 5 years. Assessing lagging indicators through LTM is important for detecting structural changes in soil and vegetation and trends in the functionality of the ecosystem processes. Such changes cannot be assessed with STM as attributes such as soil carbon and botanical composition demonstrate slower, more incremental changes and consequently are considered lagging indicators.

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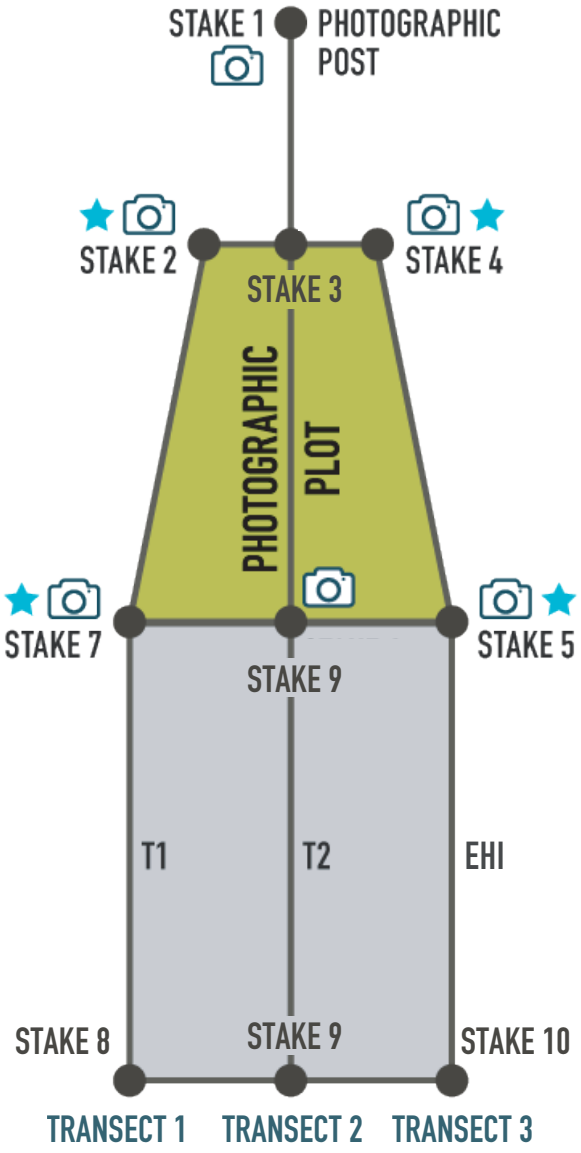
EOV's LTM Protocol establishes monitoring sites that include both photographic plots and line transects. Photographic plots are inexpensive, easy to install, and generate valuable information in structural changes within soil and vegetation. Line transects have been designed to maximize the information obtained for the least cost. The information derived from transects yields high quality data that shows the state of the ecosystem processes and their trends. An aggregation of data from these transects can be published in any scientific paper, as they are based on sound, widely accepted criteria and methodologies.

LONG TERM MONITORING SITE DIAGRAM



1. **Evaluating Long Term Ecological Monitoring Site: Plants and Soil Surface**

   Each site includes a photographic plot and three transects.

   I. Transect 1 & 2: location for evaluating the Plant Composition/Soil Cover using line Point and Flexible Area Measurement which provides data regarding:

      a. Bare Ground

      b. Litter Cover

      c. Foliar Cover of Perennial Plants by Species

      d. Cover Percentage by Functional Groups

      e. Biodiversity indicators such as Species Richness and Shannon-Wiener Index

   II. Transect 3: location for evaluating Ecological Health Index (EHI) score on a quantitative sampling. Photographs are taken on 10 quadrants, and EHI is estimated inside a belt of 0.5 x 25 m.

   III. Data is recorded from each transect and uploaded to the Savory Global EOV Platform. Data is analyzed in the context of the ecoregion and a report is prepared by the Hub Verifier in each region. Audits are determined by EOV Quality Assurance.

   IV. Regional data is sent to Quality Assurance for global analysis and additional audit planning.

   V. Results for each land base are sent to producer with follow-up if necessary.

2. **Evaluating Long Term Ecological Monitoring Site: Soil indicators**

   Current soil indicator protocols include:

   i. Water Infiltration in the Field

   ii. One of the following

   Soil Carbon Content

   Soil Carbon Content + Soil Health (Haney test or Cornell test)

   Soil Health (Cornell test)

I. Water infiltration in the field

(protocol for water infiltration is based on NRCS (1999).

II. Soil Carbon

a. Sample locations are selected in the LTM sites, approximately 5 meters from stakes 4, 6, 7 and 9. Three cores are taken from each of four sampling locations at a depth of 0-30 cm. This is divided into three depths (0 to 10, 10 to 20 and 20 to 30 cm) and mixed within each depth.

b. The soil samples from each sampling location at each depth will be analyzed individually for total carbon. Total carbon will be estimated using the dry combustion procedure, which accounts for total carbon.

III. Estimating Soil Carbon Mass

Our protocol is adjusted from the protocol of Wendt and Hauser et al (2013) and from the work of Dr. Rebecca Ryals, University of California, Merced.

3. Soil Health

A. Method 1: Soil Health

The overall assessment of soil health and biology is derived from the Haney test, developed by Dr. Rick Haney, USDA ARS. These measured indicators of soil health can give inference on next steps to improve soil health.

i. Soil Microbial Activity
The Solvita 1-day CO2-C test is performed.

ii. Water Extractable Organic Carbon and Nitrogen (WEOC and WEON
WEOC and WEON represent the available nutrients (mineralization) in the soil that feed the microbes.

iii. Haney Soil Health Calculation
(for more information, visit: www.wardlab.com/haney-info.php)
Soil health calculations can range from 0-50. Generally, soil health scores should be above 7.

B. Method 2 : The Standard Soil Health Analysis Package of the Comprehensive Assessment of Soil Health (CASH) from Cornell University.

The test includes Soil pH, Organic Matter, Modified Morgan Extractable P, K, micronutrients, Soil Texture, Active Carbon, Wet Aggregate Stability,Soil Respiration, Autoclave-Citrate Extractable (ACE) Protein Test,Available Water Capacity. The test measures indicators of the water cycle including wet aggregate stability and available water capacity, water infiltration. Minimum Cash Scores are 60 points, optimal soil structure and function correlates with scores above 80 points.

E. DATA PROCESSING AND REPORTING

All field data collected on reference areas and farms by accredited monitors and Hub Verifiers are uploaded to the Savory Global EOV Data Platform. GPS coordinates, photos and specific comments will also be hosted on the digital platform. This platform is able to import farm production data and management plans crucial to inform outcomes and opportunities for improvement or learning. It is the responsibility of the Accredited EOV Short Term Monitor or EOV Hub Verifier to add the data to the platform in a timely and accurate manner based on local conditions and connectivity. A results report is then given to the producer that outlines opportunities for mentoring.

Photo credit BTBETTY

EOV IMPLEMENTATION

1. **Part 1: Regional Hub Set-Up**
2. **Part 2: On-Farm Monitoring**
3. **Part 3: Regional & Global Quality Assurance**

Performed by Global Quality Assurance Team, Master Verifiers and Hub Verifiers

EOV QUALITY ASSURANCE

EOV is supported by sound quality assurance procedures and protocols. Each monitoring activity is carried out by accredited Verifiers and Monitors with deep knowledge and experience in the given regional context. Data uploaded onto the EOV platform is reviewed and analyzed by the regional Hub Verifier and the Global Network of Master Verifiers. On an annual basis, an average of 5% of all participating farms are subject to an on-site audit. The selection of farms to be audited are a result of: data analysis (any farm with suspicious or inconsistent data relative to the regional trends will be audited). Additionally, data from STM conducted by Monitors who are the managers of the land base have an increased likelihood of being audited. Random selection will be used to determine the remaining land bases that are audited in a given year. Given the close relationship of Hubs to the producers they serve and support, and the ability to efficiently analyze large data sets from a given region using the digital platform as well as the Hubs knowledge of the region they serve greatly decrease the need for a large number of farm audits.

SAVORY INSTITUTE (SI) PROFESSIONAL ACCREDITATIONS FOR EOV

EOV Monitors:

There are two categories of EOV Monitors: Short Term and Long Term. Both categories are represented by individuals with proven experience in rangeland and pasture management in the regions they are serving. They are trained and qualified to provide independent annual Short Term and Long Term monitoring services for Savory Hubs and their producer networks. Farm and ranch operators may be trained to monitor the Short Term sites on their land base, but cannot conduct the Long Term monitoring.

EOV Monitors' training starts with a 4-day training session on STM. They need to show proficiency on STM by monitoring two complete farms independently. A second 2-day training on LTM follows, which can be replaced by on-the job training by the Hub Verifier. The training is designed as a combination of hands-on and webinar sessions, and provides a deep understanding of the ecological indicators involved in the protocol and their assessment process, the scientific data collection mechanism for each monitoring technique (Short Term and Long Term) and associated methodologies, and how to enter appropriate data records (including photographic records) in the digital platform.

Hub Verifiers:

Hub Verifiers are experienced land managers, and practitioners of Holistic Management and regenerative agriculture. It is a prerequisite that they are accredited as Field Professionals with the Savory Institute to ensure a thorough and holistic understanding of the effectiveness of ecosystem processes and health. Hub Verifiers receive additional training in the EOV protocol to ensure the development of consistent, robust and repeatable monitoring practices across the globe. Hub verifiers play an important quality assurance role. Hub Verifiers serve 4 primary roles:

A. Supporting the preparation of their Hub to engage in EOV set-up for producers, including defining ecoregions, functional groups, states, and transitions, establishing reference areas, and calibrating the Evaluation Matrix Scorecard in each ecoregion. This is done with guidance and support from Master Verifiers.

B. Set up STM and LTM at farms wishing to be EOV verified.

C. Conducting the review and analysis of the data records submitted to the centralized database in the EOV digital platform to ensure the data is valid and reliable. EOV Verifiers will note any significant issues found in a report to the farmer, and then award the verification or schedule audits, as appropriate.

D. Training and QA of STM and LTM in their regions.

Training for HUB Verifiers includes:

A. Pre-training assignments: readings and ecoregion research.

B. Course 1 (5 days) EOV Preparatory work, STM and LTM taught by a Master Verifier.

C. Post Training activities: submit two complete farms into the EOV Digital Platform.

D. Course 2: EOV Verification - taught by EOV QA professional.

E. Accreditation as HUB Verifier by SI (after passing an exit review).

Master Verifiers:

These are highly experienced land managers. They are Savory accredited Field Professionals and practitioners of Holistic Management with experience in regenerative agriculture in an extensive range of ecological settings. Master Verifiers are responsible for training Hub Verifiers and facilitating the set-up of the Hub regions with their ecoregions. These individuals provide Quality Assurance and support for the network of Hub Verifiers worldwide. This growing global body contributes to the ongoing evolution of the EOV protocol.

Global Quality Assurance (QA):

A QA Team (Ovis 21 and Scientific Advisory Team) will oversee quality control for EOV globally. All the global data aggregated by EOV Verifiers around the world will be analyzed, correlations established, and lessons learned. If there is data that looks inconsistent or suspicious, the specific Hub Verifier and verification process will be audited and issues addressed.

All lessons and insights will be shared with the Savory Network and will form the basis for Network communications to inform the public, media, market partners, policy makers, and other stakeholders. Additionally, data will be published in scientific peer-reviewed papers by interested research institutions, advancing the credibility of the work globally.

All Hubs are encouraged to partner with local research institutions and scientific bodies to add layers of monitoring relevant to their context. Many Hubs are partnering with universities, conservation groups, wildlife groups, and others interested in measuring the impact of management on target indicators. This adds transparency, robustness and additional data to the learning platform and network.

EOV FAQs

What is Ecological Outcome Verification (EOV)?

The EOV is the scientific methodology that measures ecological outcomes on participating producers' land establishing positive or negative trends of ecological health over time. It is the empirical backbone of the Land to Market program.

What are the origins of EOV?

The EOV has been built on Savory's Holistic Management (HM) comprehensive ecological monitoring methodology. EOV has built upon that foundation to increase the scientific rigor of the monitoring by collaborating with scientists and research institutions that focus on the intersection of climate, water, and food security with the overarching goal of the ecological integrity of grasslands worldwide.

What does EOV measure?

EOV assesses five key outcomes that define land regeneration: a) Ground cover; b) Water infiltration; c) Biodiversity; d) primary productivity; e) Soil Carbon and health. These are measured with valid and reliable methodologies.

How was EOV developed?

Each Hub in the Savory Global Network is a contributing organization and their producer and scientific networks are constantly providing guidance and input. Ovis 21, a Savory Hub, has led the creation of the scientific methodology, in collaboration with scientists at Michigan State University (MSU), another Savory Hub, and with input from scientists and from research institutions around the world. Ovis 21 and MSU are taking the lead in aggregating and analyzing the emerging data from the participating Hubs and their producer networks. They will be joined by other research institutions and scientist groups in our global Network with the goal of creating one of the largest global databases for monitoring grassland health and associated ecosystem services that will inform the public, policy makers and markets.

How is EOV different from other certification programs?

The primary differentiation is EOV is outcomes based while other certification programs are process based. We measure *results* where other document what farmers *do*. EOV is designed to engage farmers and ranchers around the world in continual learning and support toward their enduring success as business leaders and land stewards. To that end, the key difference between EOV and other certification programs is that it is driven by producers, from the bottom up, with outcome-based benchmarks, rather than from the top down, with practice-based benchmarks. The goal of Land to Market is not to compete with other certification programs, but rather to add value to them, by providing producers with the critical tools and knowledge they need to affect a profound improvement in ecological systems around the world for years to come.

How can I get involved as a farmer or rancher?

Producers engage with their regional Savory Hub, which deploys a Hub Verifier to visit their property and begin the process of establishing the farm's baseline. STM is repeated and renewed annually, with LTM occurring every five years. If the EOV verification is received, the producer has the option to enter into the Land to Market Verified Regenerative Supplier Roster. The roster is accessed by affiliated brands, retailers and end consumers for their sourcing needs. Producers not receiving EOV (ecological outcomes trending negatively in the context of their region) may continue to engage with their regional Hub for training and implementation support. In short, the EOV is designed to invite the producer into a shared process of continual improvement in community with their peers. Please see the onboarding section of this chapter(page 14) for more information.

What product categories does EOV apply to?

Currently the EOV protocol is being deployed in livestock operations that produce meat, dairy, wool or leather. Future phases of the program may incorporate land bases dedicated to raising other products or offering other services such as ecosystem services or ecotourism.

How much does it cost to participate in EOV?

Each regional Savory Hub sets up their own pricing structure for baseline and annual monitoring visits. Fees for participation are negotiated with and paid directly to the regional Hub by the participating farmer or farmer group. Baseline and LTM visits typically involve 1-2 days of work by a Hub Verifier. STM will depend on the size of the farm or ranch but typically will take one to two days.

What if I don't have a regional Hub in my area and I want to participate?

Savory Network Hubs are the program's primary mechanism to evaluate and verify new producers. However, if your operation is not near an existing Hub we have a network of Master Verifiers and Accredited Field Professionals who may be able to work with you. Please contact us via our website and we will put you in touch with the appropriate representative.

I don't see my question answered here. Where can I go for more information?

Please contact our EOV Quality Assurance team at eovqa@savory.global

GLOSSARY OF TERMS

Ecological Health Index (EHI Score): The numeric score that EOV-enrolled land receives after completion of data gathering and filling of the regionally calibrated Evaluation Matrix (leading indicators only). Scores show the numerical distance to the potential of ecosystem processes of the ecoregion, expressed by the reference area.

Ecological indicators: Attributes of soil surface and vegetation that reveal the effectiveness of ecosystem processes. They are used on the Evaluation Matrix to evaluate Ecological Health Index (EHI).

Ecoregion: Area that contains characteristic, geographically distinct assemblages of natural communities and species. The diversity of flora and fauna that characterize an ecological re region tends to be distinct from that of other ecological regions. Ecological regions are the result of climate, geology, and landforms. They have a defined degree of britleness and therefore have differential responses to management tools.

Evaluation Matrix : A matrix of up to 15 biological indicators (rows) and five possible situations of each indicator. Determines the score for a particular site in a way that is contextualized for a specific ecoregion.

Functional Groups: A set of plant species that share the same type and ecological role. The relative proportion of functional groups of plants determine the state of the land. This includes warm season grasses, cool season grasses, forbs/legumes and shrubs/trees.

Hub Verifier: An Accredited Field Professional with the Savory Institute working in close association with a Hub in a given region. They are trained in EOV to be able to do the preparatory work in an ecoregion including understanding and diagramming the states of land that can occur in an ecoregion, the ways to transition between states, the functional groups of plants in that ecoregion, installing reference area LTM sites, and the development of the Evaluation Matrix for the ecoregion. They also perform verification and auditing of monitoring done by EOV Monitors.

Lagging indicator: Lagging indicators are largely captured in LTM and are outcome indicators. Unlike leading indicators, lagging Indicators do not provide information that can be used to make quick corrections to management. Evaluating these lagging indicators can be expensive and require a Long term Monitor to collect the data. However, the lagging indicators provide us with strong scientific validation on the functioning of the ecosystem processes.

Leading Indicator: leading indicators are those that usually change before others, and therefore have some predictive value about the direction of changes. Leading indicators are useful for documenting and influencing management and are largely covered in Short Term ecological monitoring.

Long Term Monitoring: Baseline monitoring in year 0 and repeated every five years. This includes a photographic plot, two plant composition/soil cover transects, and one Ecological Health Index transect, along with soil health measurements. Sites are set up for ecoregion reference areas and for LTM on each land base. This ties the LTM soil surface transect 3 to the Short Term monitoring using the same ecological indicators listed on the Ecological Health Matrix.

Master Verifier: Master Verifiers are a select group involved in the further development and refinement of the EOV methodology. Master Verifiers provide training to Hub Verifiers.

Reference Area: LTM site in any land base (within or outside producer network) that is the best known expression of biodiversity, site stability, and ecosystem function for a given state in an ecoregion. It may or may not be inside the land base being verified. These areas are benchmark points for the relevant states for the rest of the LTM sites in the land bases in that ecoregion. The concept of reference areas is dynamic, as proper management can generate new reference areas and change the parameters of what can be achieved.

Short Term Monitoring: Done across each land base annually in multiple paddocks. Provides a score for each paddock and a weighted average for the farm. The weighted average is used in the EOV verification of the farm.

State: States are alternative assemblages of functional groups and plant species, that determine physiology, soil attributes, and ecosystem function inside an ecoregion. For example, grassland, grassland/shrubland, shrubland, cropland, and savanna could be the states within a given ecoregion.

Transitions: Transitions represent the change of vegetation and soil from one state to another. If grasslands switch from their current state to one that represents lower ecosystem health, that transition is undesirable. Conversely, land regeneration could be defined as the management of transitions to create the most vibrant and effective state in terms of ecological health and productivity. Transitions are always caused by the intended or accidental use of tools: technology, fire, rest and living organisms. A transition catalogue describes how the management of each tool promotes transitions.