EOV Scientific Protocol

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 seeded grasslands, as well as grazed orchards, sylvopastoral systems and mixed livestock-cropping systems and/or forest areas. Pure cropping systems would not be included, except for Pilot projects. 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 and when 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. Using well recognized

Ecoregions maps, contextualization occurs by defining a catalogue of alternate states of soil and vegetation within each ecoregion. These are defined as State and Transition catalogues. Within an Ecoregion reference areas are identified based on a desirable state demonstrating higher biodiversity, resilience, and ecosystem function effectiveness.

Reference areas in conjunction with a State and Transitions catalogue are used to develop an evaluation matrix of Ecological Health consisting of ecological indicators. The result-

resulting matrix is used in evaluating and verifying 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.

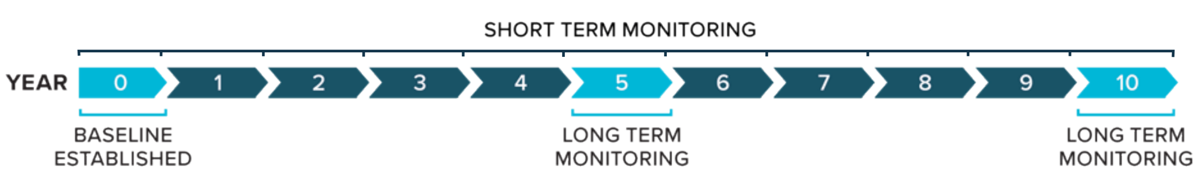

Photo credit BTBETTY

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 of their land can find such services with their regional Savory Hub. Several leading indicators in the EOV protocol provide rapid, instructive feedback on an annual basis for land managers in their daily management decisions. Every five years the regional Hub Verifier will collect additional data of lagging indicators, such as biodiversity and soil carbon. The understanding of the relationship between leading and lagging indicators is an incredible asset for those managing land.

Photo credit BTBETTY

EOV Metrics Summary

Farms (Land Bases) are set up with EOV defining a monitoring plan. Satellite imagery and other information sources are used to separate strata (sources of heterogeneity). A farm monitoring plan will combine Short Term Monitoring (STM) sites and soil sampling sites distributed throughout the farm, following a stratified random sampling scheme, with Long Term Monitoring (LTM) sites (including photopoints). These are permanent benchmark sites, located at representative areas of the farm or ranch, that provide information about biodiversity and water infiltration rates and are located at representative areas of the farm or ranch. Both monitoring procedures are linked by the Ecological Health Index, calculated using the Evaluation Matrix (Scorecard) for the associated Ecoregion.



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 documenting 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 (FG)
  - Warm season gras ses
  - Cool season grasses
  - Forbs and legumes
  - Trees and shrubs
- Contextually desirable species
- Contextually undesirable species
- Litter abundance
- Litter decomposition
- Dung decomposition
- Bare soil
- 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. lagging indicators do provide strong scientific validation of the existence and magnitude of regeneration processes that imply relevant ecosystem services, like the increase of biodiversity, water infiltration and carbon sequestration.

EOV Onboarding Process

In order to 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 Web site (savory.global) or contact your regional Hub. Regional Hubs can be located on the Savory Web site.

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 visit the farm to conduct the annual STM. If results trend positive in the context of the ecoregion, Verification is granted/renewed and the farm has the chance to access 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 an Accredited EOV Monitor returns to the farm to conduct LTM. If data confirms STM positive trends, Verification is granted/renewed and farm remains on Land to Market Verified Regenerative Supplier Roster.

Photo credit Judith Crispin, with permission

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

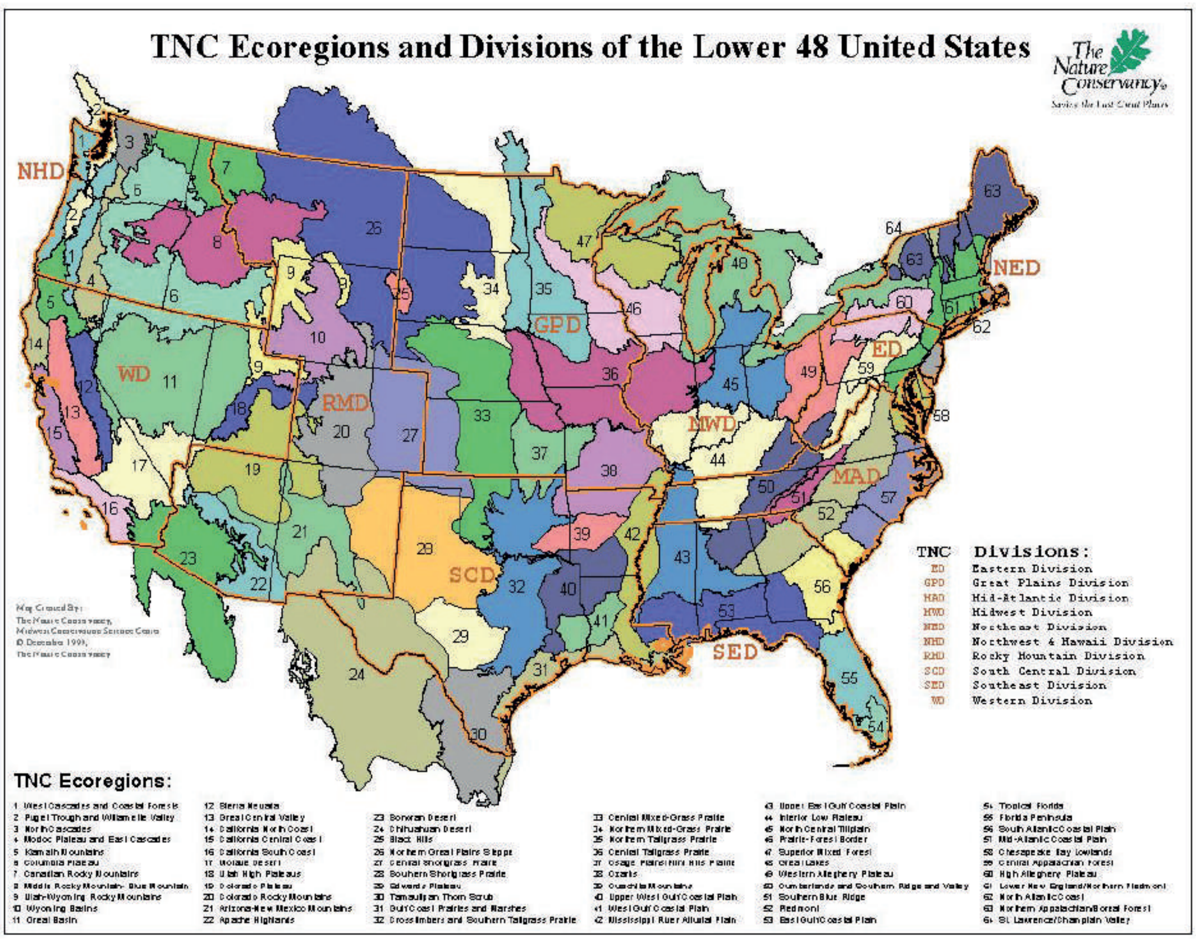
2 Part 2: On-Farm Monitoring

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 biodiversity of flora, fauna and environments that characterize an 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 ecoregion must be taken into account. The ecological region is selected based on an ecological map that is widely accepted by 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

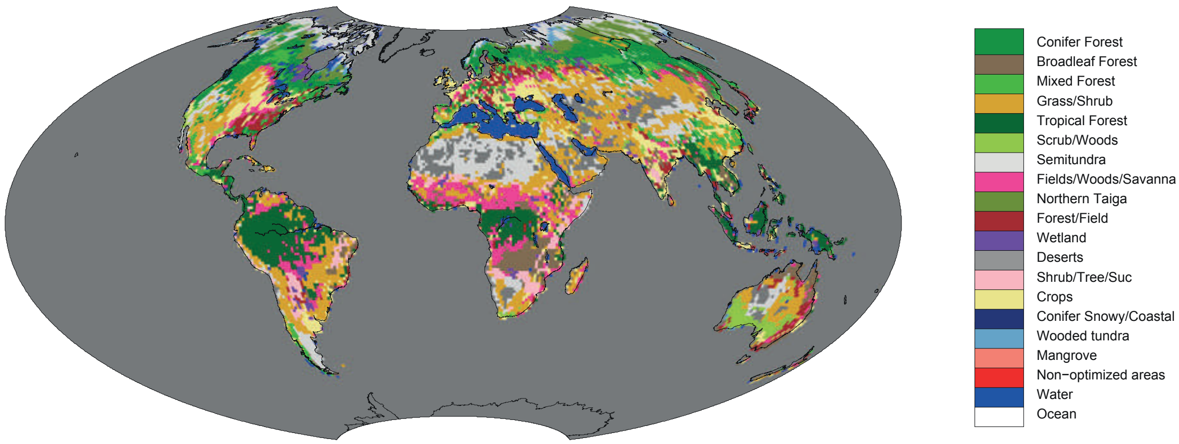


Image source: www.noaa.org

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 articulate the functioning of the ecological region and to recognize the challenges for regeneration of grasslands and biodiversity. State and Transition catalogues are relevant for this purpose. The Hub Verifier will review if there are previous publications on this subject, and will proceed as follows:

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 the key species of each functional group. Key species are abundant, but with higher sensitivity to improper grazing than other species within the functional group. They are leading indicators for community dynamics.

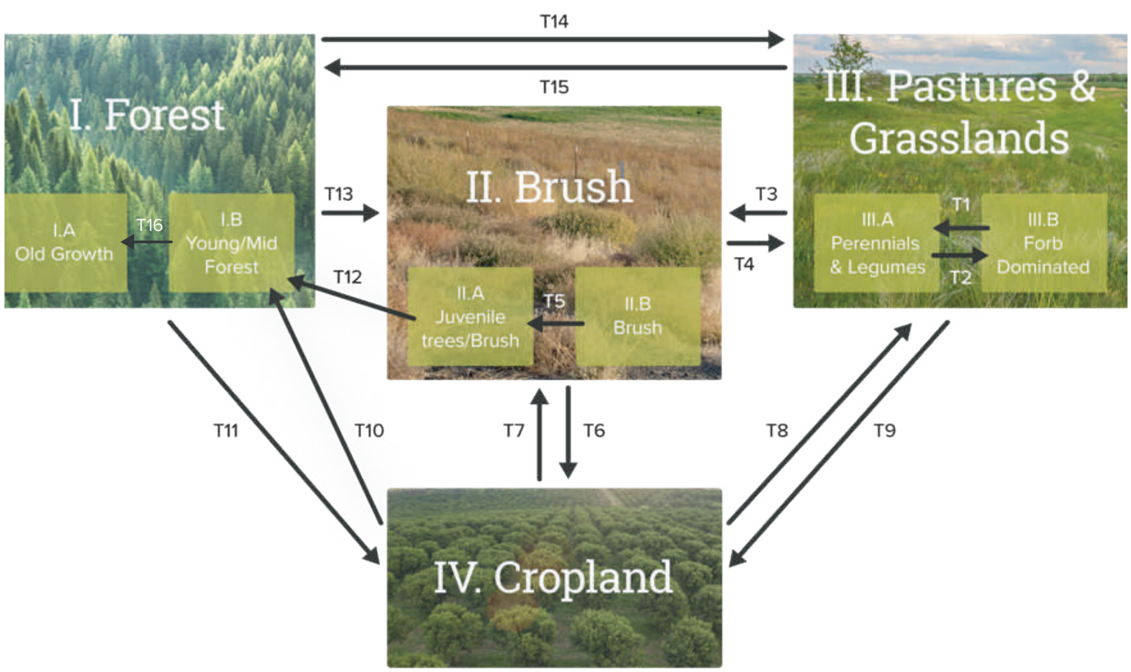
D. Define/revise possible transitions between the states in the ecoregion

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

This information is then used to compile a State and Transition Catalogue for that ecoregion. The Catalogue summarizes the possible states of vegetation, functional groups of plants in each state, possible transitions between states, and the tools/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, labor & Money, and Human Creativity
T2. Partial rest for over grazing 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 clearing, Labor & Money, and Human Creativity
T5. Rest, partial rest
T6. Technology/clearing/cultivation, Labor & Money, and Human Creativity
T7. Rest, partial rest
T8. Holistic Planned Grazing, animal impact, herd effect, technology, labor & Money, and
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 given ecoregion. Reference areas are the closest example of the desired future resource base in a particular environment for a given context. It must be noted that 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. Reference areas are established to create a benchmark and are used to develop an Evaluation Matrix of leading ecological indicators for the specific ecoregion. Reference areas 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 then 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. Some of the ecological indicators are absolute and the rest are calibrated relative to the reference areas for each ecological region. The calibration is needed for certain ecological areas to account for differences related to the degree of brittleness of an area and its potential. To calibrate an Evaluation Matrix, generic descriptors for the ecological indicators are reviewed by Master Verifiers and the Hub Verifier relative to the reference area in the region and their expertise of ecoregion variability. The indicator descriptions on the Evaluation Matrix are adjusted for the characteristics of each ecoregion.

Photo credit Judith Crispin, with permission

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 BASE 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 different strata, that can be determined by topography, soil type, vegetation type, past management and other sources of variation. Strata bondaries are defined and their area calculated. Mapping can be done using online resources (e.g. Google Earth) or using digital processing software on satellite imagery. This is done by an accredited EOV Monitor in collaboration with the farmer.

B. FARM MONITORING PLAN

A stratified monitoring plan is produced by an Accredited EOV Monitor. The plan determines the number and location of both STM and LTM sites.

1. Short Term Monitoring Sites

STM procedures imply assessment of EHI score, with a minimum of 10 sites spread across the farm, according to strata proportions. Optionally, STM will include going through all the paddocks and assess forage quantity and quality. Farmers need to provide information about livestock numbers, secondary production and management activities.

2. Long Term Monitoring Sites

The final number of LTM sites will depend on the number of strata and their size.The EOV accredited Monitor will define the number, type, and location of LTM sites according to the size and heterogeneity of the land base.

a) Soil Carbon Sampling. Soil C Stocks are estimated using stratified random sampling. Soil samples are taking randomly at pre-defined sites, taking intact soil cores from 0-30 cm.

b) Biodiversity and Water infiltration are assessed in permanent benchmark sites. The number of sites depends on the number and size of strata (spatial variation).

Minimal number of LTM sites may be 1 for small, homogeneous farms, up to 12 on large, heterogeneous farms. Benchmark sites are assigned proportionally to the relative area of strata. EHI from STM is used to inform LTM sites location.

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

Photo credit BTBETTY

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.

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 farmers, and works through the indicators comparing visual observation with the indicator descriptors on the Evaluation Matrix. This evaluation is easy to learn and meaningful, requiring about ten minutes per checkpoint. Producers and professionals can learn to conduct STM in a three-day training resulting in reliable EHI scores less than a standard deviation of 10 points among monitors.

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. For example in an ecoregion leaning toward the non-brittle end of the brittleness scale it can 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 resource 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.

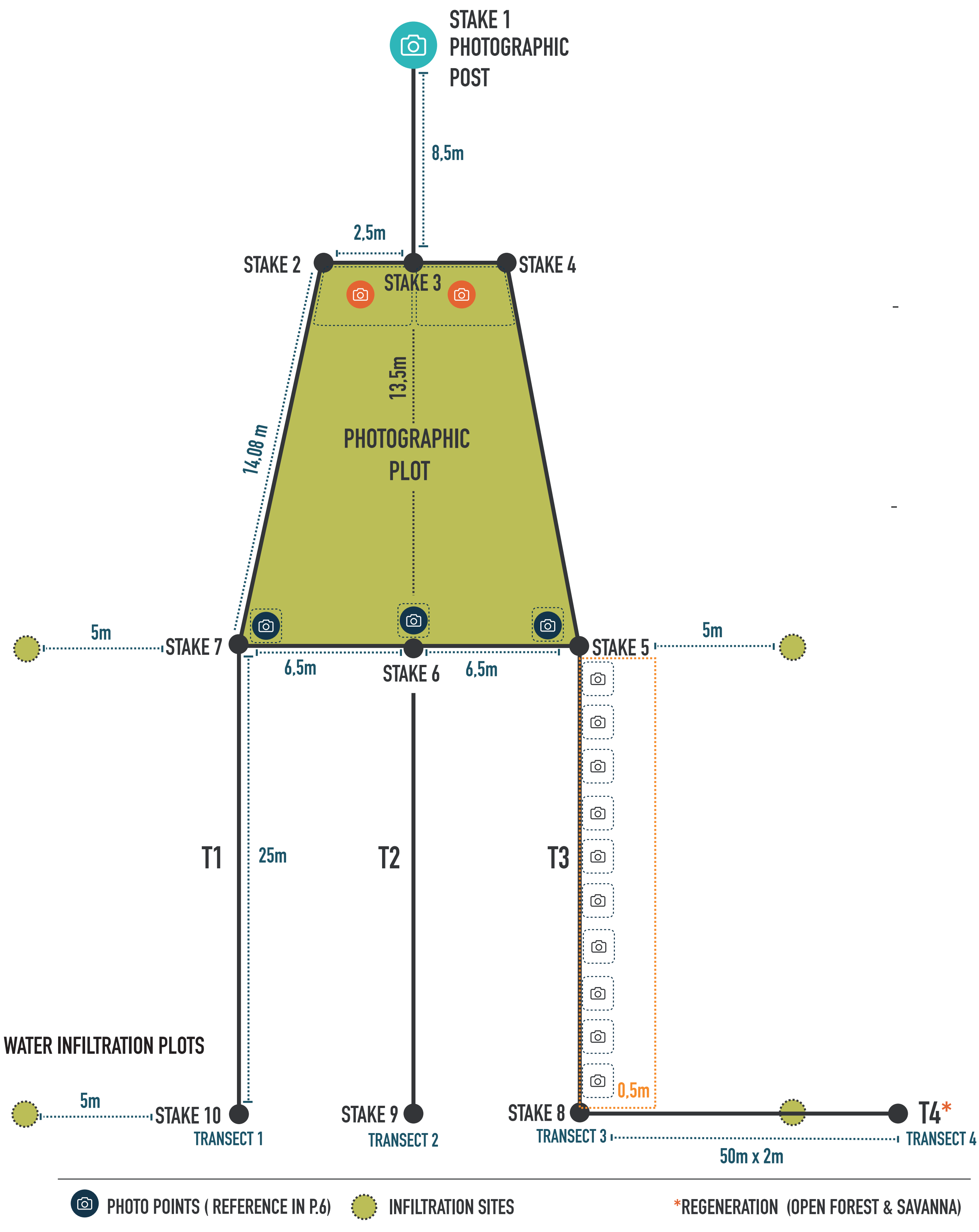
D. LONG TERM ECOLOGICAL MONITORING

LTM monitoring begins with the establishment of the landbase baseline and is then repeated every 5 years. Optionally photographic plots may be checked yearly along with the STM. LTM tracks changes over time using objective and scientifically sound monitoring methods. Assessing lagging indicators through LTM is important to detect structural changes of the land base and track 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.

Photo credit Judith Crispin, with permission

EOV's LTM Protocol includes LTM benchmark sites to detect vegetation and water infiltration changes and a stratified random sampling scheme for soil C and Soil Health. Benchmark sites include photographic plots, line transects for vegetation and a sampling scheme for water infiltration plots.

Diagram of Long-Term Ecological Monitoring Site - Metric



1. EVALUATING VEGETATION AND WATER INFILTRATION CHANGE:

Plants and Soil Cover benchmark 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 Soil Cover

   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 Wien ner Index

II. Transect 3: location for evaluating Ecological Health Index (EHI) score on a quantitative sampling. Photographs are taken on 10 quadrats, and EHI is estimated inside a belt of 0.5 x 25 m. The distance to the nearest perennial plant is measured with 10 replications.

Iii. Water infiltration in the field (protocol for water infiltration is based on NRCS 1999).

IV. 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 EOV Monitor in each region. Audits are determined by EOV Quality Assurance.

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

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

2. EVALUATING SOIL CARBON CONTENT AND SOIL HEALTH

Current soil indicators protocols include one of the following

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

Soil Carbon Content

Soil sampling is distributed throughout the farm, following the STM monitoring plan. At each location, 1 or 2 randomly distributed soil samples are taken, at a depth of 0-30 cm.
Each sample is a composite of 3 cores. Fine soil bulk density is estimated from the total dry weight of the intact cores, corrected by the weight of gravel. Soil C mass is estimated using Equivalent Soil Mass procedure, as proposed by Wendt and Hauser (2013)
Samples are delivered to soil lab for dry weight, gravel weight and Soil C determination. Total combustion using Walkley-Black is the preferred method, although EOV adapts to each context.

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 EOV 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 Accredited EOV Monitor to add the data to the platform in a timely and accurate manner according with local conditions and connectivity. A results report is then given to the producer and opportunities for mentoring are outlined.

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 Verifiers 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 performing two complete farms independently. A second 2-day training on LTM follows, that 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 make 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 Profession als with 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 in farms wishing to be EOV verified.

C. Hub Verifiers are a central piece of EOV QA. They have direct responsibility in the validity and consistency of the data uploaded to the EOV digital platform. They may receive Hub Audits from Savory Institute. HUB Verifiers then create the report for the farmers and bestow 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 EOV Verifiers worldwide. This growing global body contributes to the ongoing evolution of the EOV protocol.

Global Quality Assurance (QA):

A QA Team and Scientific Advisory Team will oversee quality control for EOV globally. All the global data aggregated by HUB 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. A Terms of Use Agreement defines that the farmer is the only owner of the EOV data, but authorizes the use of them for scientific and learning purposes.

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)?

EOV is a scientific methodology that provides metrics to land regeneration. It is the first outcome based, contextually relevant method that allows monitoring regeneration with a holistic approach. EOV Verified farms can access the Land To Market Program, reaching conscientious consumers, brands and environmental services markets.

What are the origins of EOV?

EOV has been built on Savory's Holistic Management (HM) comprehensive biological 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. 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 document for more information.

What product categories does EOV apply to?

Currently the EOV protocol is being deployed in land bases of livestock operations, namely meat, dairy, wool and 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, and 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, 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 EOV Quality Assurance team at eovqa@savory.global or with your regional Hub .

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 biodiversity of flora, fauna and environments that characterize an 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.

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 HUB Verifier is an Accredited Field Professional with the Savory Institute and 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 outcome indicators. Unlike leading indicators, when we know lagging Indicator values there is little chance to make corrections quickly. Evaluating these lagging indicators can be expensive and require Long Term Monitoring to be performed. However, it provides us with strong scientific validation on the function 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. Quantitative estimations that combine stratified random sampling for Soil C Data, with benchmark LTM sites where plant composition and soil cover are assessed, along with EHI and water infiltration.

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 physiognomy, 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 one 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.