AI and Machine Learning in Conservation Training Course

Professional Development Training Course Outline

Category	Environmental Management and Conservation	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The **intersection of technology and conservation** is revolutionizing how we protect our planet's biodiversity. This course introduces conservation professionals to the transformative power of **Artificial Intelligence (AI)** and **Machine Learning (ML)**. By leveraging these cutting-edge tools, we can move beyond traditional, labor-intensive methods to achieve scalable and impactful conservation outcomes. Learn to apply advanced data analysis, automation, and predictive modeling to address pressing environmental challenges, from illegal poaching to habitat degradation.

AI and Machine Learning in Conservation Training Course focuses on practical, real-world applications of AI/ML in conservation science. Participants will gain hands-on experience with key technologies like **computer vision** for species monitoring, **predictive analytics** for wildlife management, and **geospatial analysis** for habitat mapping. We'll explore how to harness big data from sources like camera traps, satellite imagery, and acoustic sensors to derive actionable insights, enabling smarter, more efficient, and effective conservation strategies.

Programme Curriculum

AI and Machine Learning in Conservation Training Course

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Course Objectives

Upon completion, participants will be able to:

- Apply machine learning to analyze large datasets for efficient species and habitat monitoring.
- Utilize computer vision and deep learning for automated animal identification and tracking from camera trap footage.
- Employ AI/ML models to process satellite imagery and remote sensing data for habitat mapping and land-use change detection.
- Build predictive models to forecast environmental changes, predict human-wildlife conflicts, and inform conservation strategies.
- Understand best practices for managing, standardizing, and ethically using conservation data for AI applications.
- Apply sound recognition and signal processing techniques to identify species and monitor biodiversity from audio recordings.
- Develop AI-powered systems for real-time detection of poaching, illegal logging, and wildlife trafficking.
- Integrate AI tools to automate repetitive tasks, improving the efficiency and scalability of conservation projects.
- Use AI-derived insights to support evidence-based decision-making and influence environmental policy.
- Apply reinforcement learning and optimization algorithms to design more effective and cost-efficient conservation reserve networks.
- Build AI models to simulate ecological processes and forecast species distribution under various climate scenarios.
- Evaluate the ethical considerations and potential biases of AI technologies in conservation efforts to ensure responsible implementation.
- Effectively communicate and collaborate with data scientists and engineers on tech-driven conservation initiatives.

Organizational Benefits

- Automate data processing from thousands of images and audio files, freeing up staff for high-value field work.
- Use predictive insights to allocate resources strategically and prioritize conservation actions with greater impact.
- Analyze vast datasets at an unprecedented scale and with higher accuracy than manual methods, leading to more robust scientific conclusions.
- Demonstrate technological innovation to attract new donors, grants, and partnerships.

- Build in-house expertise in cutting-edge technologies, positioning the organization as a leader in modern conservation science.
- Employ real-time monitoring and predictive modeling to anticipate and respond to threats like poaching and deforestation.

Target Audience

- Conservation Biologists & Ecologists.
- Environmental Scientists & Researchers.
- NGO & Non-Profit Staff.
- Wildlife & Protected Area Managers.
- Data Scientists & IT Professionals.
- Government Agency Staff.
- Students & Early-Career Professionals.
- Citizen Scientists & Enthusiasts.

Course Modules

Module 1: Foundations of AI & ML in Conservation

- Introduction to AI, ML, and Deep Learning concepts.
- The role of AI in the modern conservation landscape.
- Understanding data types: structured, unstructured, geospatial, and time-series data.
- Ethical considerations, bias, and responsible AI deployment.
- **Case Study:** The use of AI-driven platforms like **Wildbook** to manage camera trap data and identify individual animals.

Module 2: Computer Vision for Wildlife Monitoring

- Principles of image classification, object detection, and segmentation.
- Training a custom ML model to identify species from images and video.
- Using pre-trained models and transfer learning.
- Implementing AI for automated count and behavior analysis.
- **Case Study:** The application of **Microsoft's AI for Earth** in a project to track and monitor endangered rhinos using drone footage and satellite imagery.

Module 3: Geospatial AI & Remote Sensing

- Introduction to GIS data and AI for spatial analysis.
- Using ML to classify land cover, detect deforestation, and map habitats.
- Analyzing satellite data from Sentinel and Landsat for conservation purposes.
- Predictive modeling for species distribution and habitat suitability.
- **Case Study:** How **Global Forest Watch** uses AI and satellite data to provide near real-time alerts for illegal logging and fire detection.

Module 4: Acoustic Monitoring & Bioacoustics

- Fundamentals of sound analysis and acoustic monitoring technology.
- Training ML models to identify species from their calls or songs.
- Detecting illegal activities like chainsaws or gunshots in real-time.
- Scaling acoustic analysis for large-scale biodiversity surveys.

- **Case Study: Rainforest Connection** deploys recycled mobile phones with acoustic sensors and AI to listen for chainsaws and prevent illegal logging.

Module 5: Predictive Analytics & Ecological Modeling

- Building predictive models to forecast environmental changes.
- Using time-series data to predict animal migration patterns.
- Modeling human-wildlife conflict hotspots.
- Applying reinforcement learning for optimal conservation reserve design.
- **Case Study:** Using predictive analytics to anticipate crop raiding by elephants and implement proactive mitigation measures.

Module 6: Data Engineering & MLOps for Conservation

- Data preprocessing, cleaning, and feature engineering for conservation datasets.
- Building and managing a robust data pipeline.
- Deploying and maintaining ML models in production environments.
- Version control for data and models.
- **Case Study:** The development of a scalable MLOps pipeline to manage and process continuous data streams from a network of remote sensors.

Module 7: Human-Wildlife Conflict & AI Solutions

- Using AI to analyze human and wildlife movement data.
- Building models to predict and mitigate human-wildlife conflicts.
- Implementing early warning systems using AI-powered sensors.
- Exploring non-lethal deterrents powered by technology.
- **Case Study:** The use of an AI-powered system that uses thermal cameras to detect approaching predators and alert livestock owners.

Module 8: AI for Anti-Poaching & Law Enforcement

- Analyzing patrol data to predict poaching hotspots.
- Using computer vision to identify illegal vehicles and activities.
- Developing AI systems for real-time threat detection.
- Integrating AI with GIS for tactical law enforcement planning.
- **Case Study:** The **PAWS** (Protection Assistant for Wildlife Security) system, which uses machine learning to guide patrols to high-risk areas.

Module 9: AI in Marine Conservation

- Automated identification of marine species from underwater footage.
- Using AI to monitor coral reef health and detect bleaching events.
- Tracking vessel movements to identify illegal fishing activities.
- Analyzing satellite data to detect marine debris and oil spills.
- **Case Study:** The **OceanAI** project that uses underwater drones and computer vision to survey and monitor fish populations.

Module 10: Ethical AI, Data Privacy & Security

- Understanding ethical frameworks for AI in conservation.
- Addressing data privacy concerns with public and community-sourced data.

- Mitigating algorithmic bias in species identification and monitoring.
- Ensuring data security for sensitive information.
- **Case Study:** A public dataset project that had to implement strict privacy protocols to protect the location data of endangered species from poachers.

Module 11: Community-Based Conservation & Citizen Science

- Using AI to engage and empower local communities in conservation.
- Developing user-friendly AI tools for citizen science projects.
- Analyzing large-scale community-sourced data.
- Feedback loops and community engagement in technology development.
- **Case Study:** The **Snapshot Safari** project, where citizen scientists help classify millions of camera trap images, with AI accelerating the process.

Module 12: Project Management for Conservation Tech

- Scoping and defining a conservation tech project.
- Agile development and project management methodologies.
- Building a cross-functional team (ecologists, data scientists, engineers).
- Securing funding and presenting project proposals.
- **Case Study:** A case study on a failed project, highlighting lessons learned in project scoping, resource allocation, and stakeholder management.

Module 13: The Future of AI in Conservation

- Exploring emerging technologies: Generative AI, Explainable AI (XAI), and robotics.
- The role of multimodal AI in conservation.
- Predicting future trends and challenges.
- Networking and collaboration opportunities in the field.
- **Case Study:** The potential of using generative AI to create synthetic data for training models on rare and elusive species.

Module 14: Final Capstone Project

- Participants apply their skills to a real-world conservation problem.
- Data preparation, model building, and analysis.
- Creating a final report and presentation of findings.
- Peer review and expert feedback.
- **Case Study:** Building an AI model to detect invasive species from drone imagery in a specific protected area.

Module 15: Career Pathways & Next Steps

- Identifying career opportunities in conservation technology.
- Building a professional portfolio.
- Networking with key players in the field.
- Resources for continuous learning and professional development.
- **Case Study:** A profile of a successful conservation technologist, detailing their career journey and key skills.

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Ready to enroll or request a customized program? Book online or contact us:

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