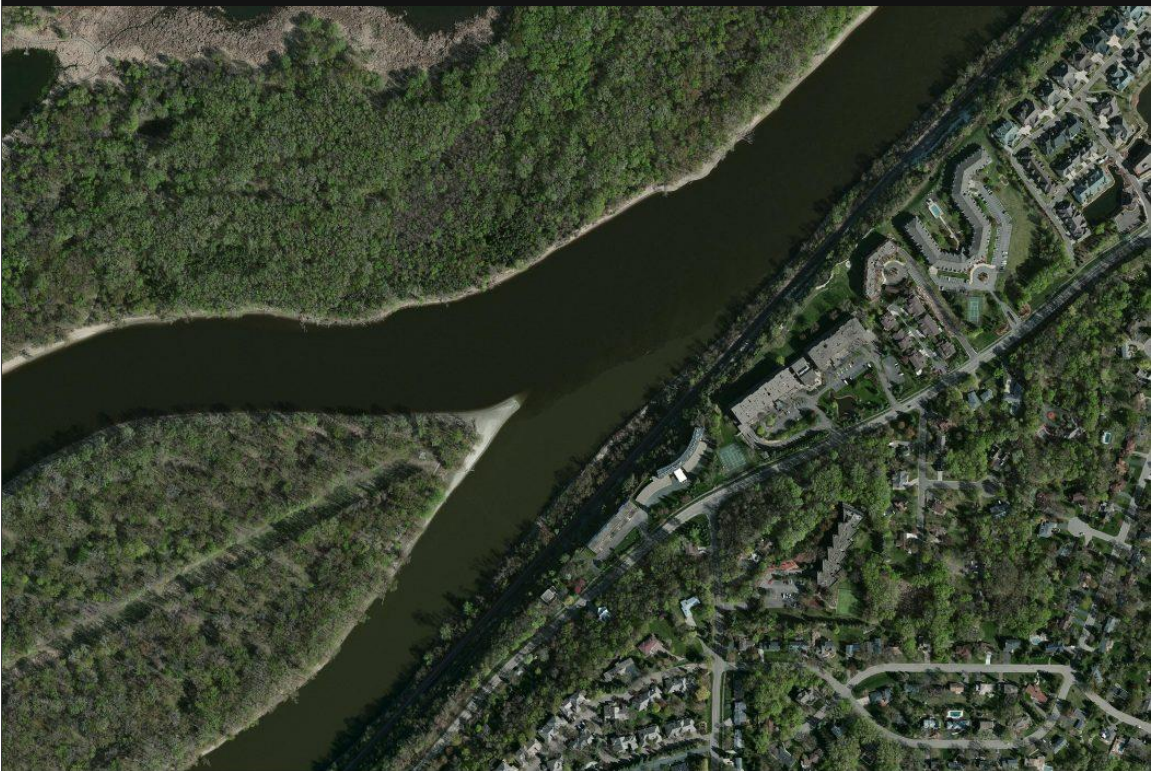


Maryland
Environmental Trust
presents:

Seeing Things from a Different Perspective

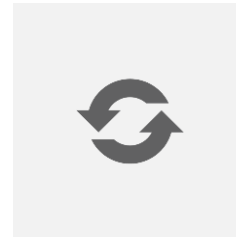
Remote easement
monitoring with
Upstream's Lens system



About Us

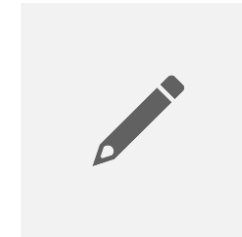
Established in 1967, MET is Maryland's statewide land trust and a unit of the Department of Natural Resources. MET now protects over 1,100 conservation easements and cares for nearly 139,000 acres.

How to Ensure that Protected Land Stays Protected?



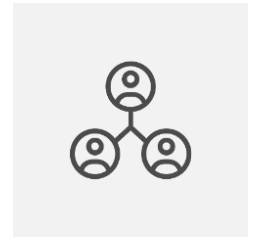
Stewardship

The "care and feeding" of properties and their owners.



Monitoring

The periodic visual assessment of land use.



Partnerships

MET relies on its 35 co-holders to monitor, steward, and ensure the terms of the easement are upheld.

Caring for nearly 139,000 acres



Ground

Drive to and walk/drive around a property, stop and take photos at strategic locations, e.g. next to streams, structures, accesses



Windshield

From vehicle, or adjacent to roadway, take photographs of landscape visible from road frontage



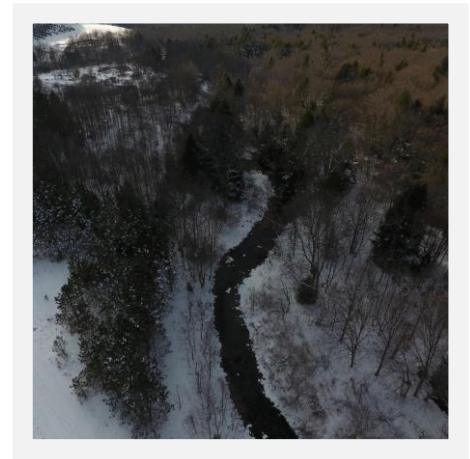
Fly overs

As passenger in fixed wing aircraft, fly to and circle properties and take photographs



GIS Imagery

Review digital imagery from public sources or from private aerial or satellite firms. Viewed in GIS or online site such as Lens



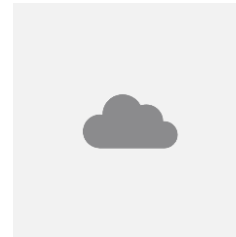
Drone

Onsite, launch a camera-equipped drone to observe portions of property difficult to access, or obscured by crops or natural vegetation



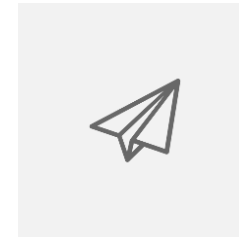
Aerial Monitoring

This is not MET's first use of remote monitoring... But timely access to consistently acquired high resolution imagery has historically been problematic.



Civil Air Patrol

Imagery: passenger uses a handheld camera, at ~1,000 feet.



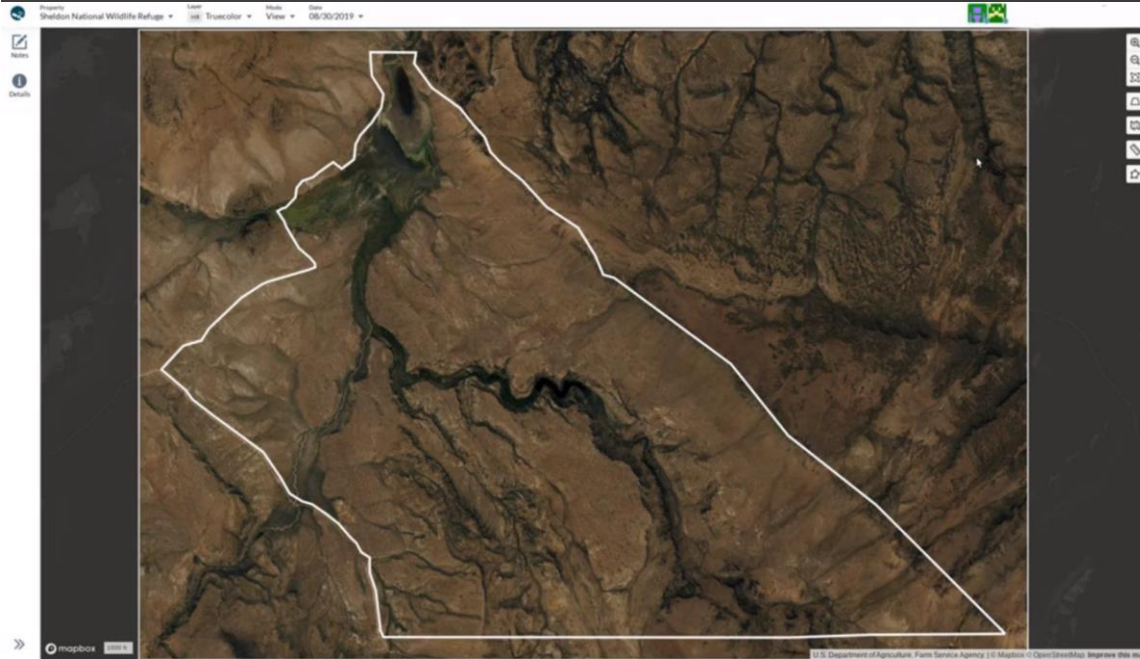
LightHawk

Imagery: similar to Civil Air Patrol (e.g. in 2020 used a Go Pro camera attached to strut of plane, at ~1,000 feet).



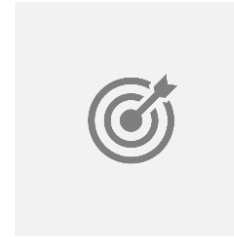
GIS Layers

Imagery: very high resolution (e.g. 6 inch) GIS imagery taken during leaf off conditions.



Upstream Tech

Lens for Monitoring



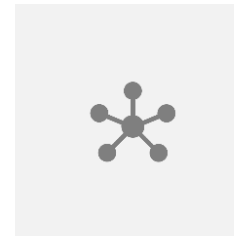
Hi Res Imagery

Access to hi res commercial satellite and public imagery



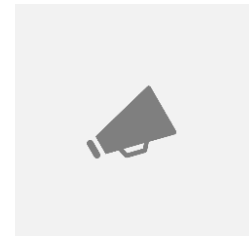
Multi-User

Unlimited number of users per organization



Features

Allows side-by-side comparison of two dates of imagery, with choice of dates

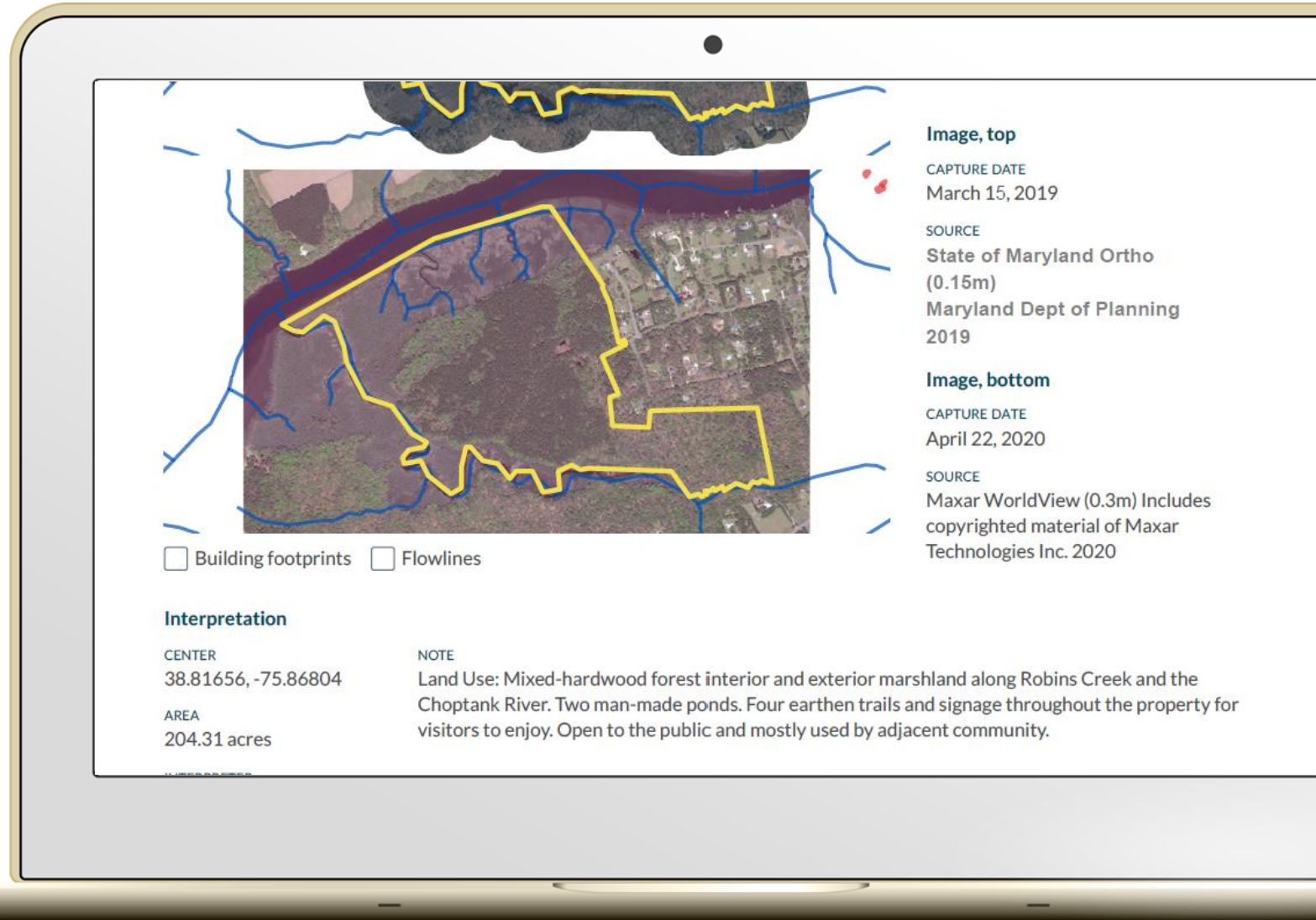


Reporting

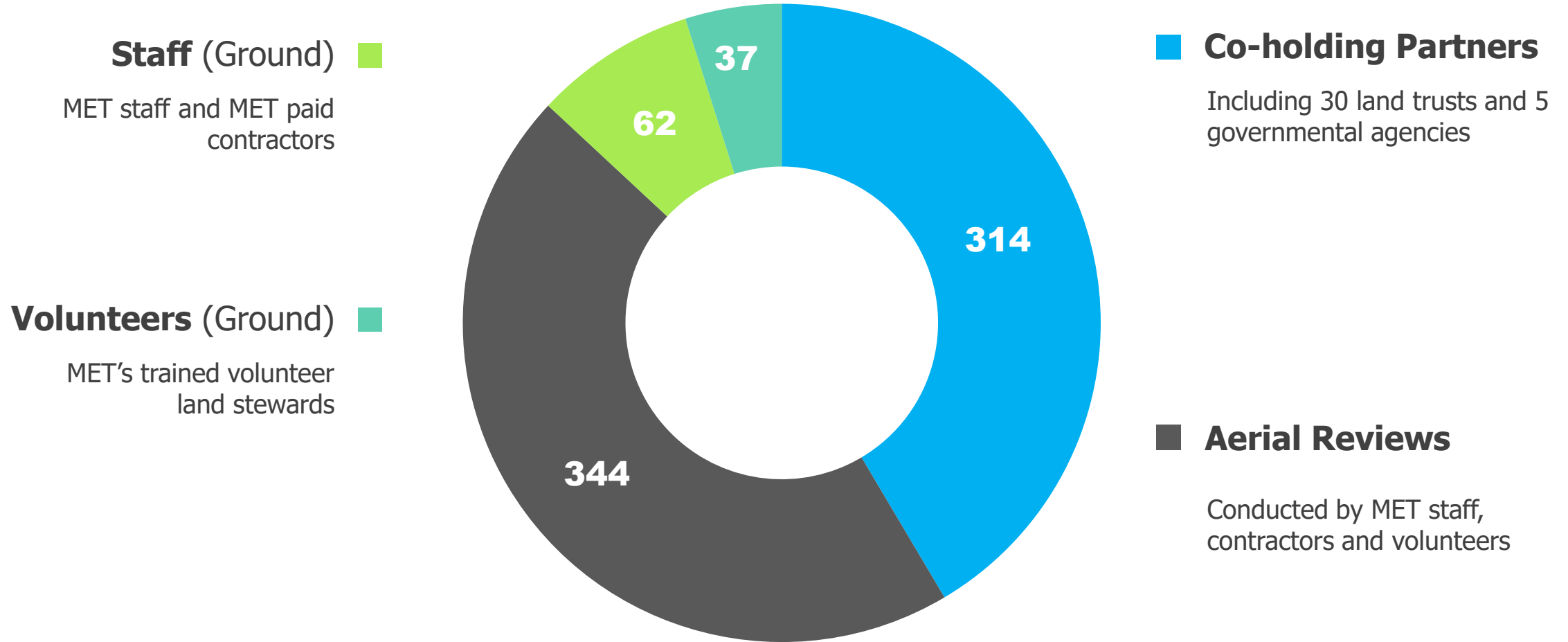
Pin areas of concern, type notes and generate a report

Other Benefits of Remote Monitoring include:

- Quick access to entire landscape, multiple dates, and imagery types
- More frequent, lower res, index layers e.g. Vegetation (IR/NDVI), Water availability, for analysis
- Zoom, measure tools, pins or polygons for areas of interest
- Ability to alternate between methods, or supplement OTG with remote depending on size of portfolio, selected frequency, and other available resources



MET's FY2021 Monitor Reporting



How does FY2021 compare to previous years?

Forecasting for success

	MET Staff & Seasonals	MET Volunteers	Co-holders	Aerial Reviews	Total
FY 2021	62	37	314	344	757
FY 2020	175	127	257	0	559
FY 2019	317	147	252	0	716

For the past few years MET has worked to adopt new technologies to support its programs, including LOCATE (Salesforce database and CRM); a field monitoring app; and most recently the use of remote monitoring via Lens. These new and innovative tools are helping MET improve and bring its programs into the 21st century.

Comparison: Lessons Learned Thus Far

On-the-Ground Monitoring

- Normal process using staff and volunteers, and is often enjoyed exercise
- Encourages familiarity with landscape, and when they are present, landowner or other on-site contact(s)
- Allows observer to see below tree cover and areas of interest up close (e.g. beneath pine stand, small piles of refuse or construction materials, use/type of structure, buffer composition, etc.)
- Not limited by timing or resolution of imagery
- Is impacted by precipitation, temperature/humidity, hunting, insects, loose animals, access

Remote Monitoring

- Multiple areas of savings:
 - Time and fuel spent traveling to/from and between properties, and eliminating returns to see areas missed
 - Eliminates need to coordinate visits with landowners or farm managers, and multiple contacts on same day
 - Allows view of all parts of a property (not obscured by tree cover), especially those difficult to access due to terrain, wetness/wetlands or crops
- Recognize that there is less landowner interaction. MET is looking into how to address the relationship piece of the puzzle.

Growth Strategy

How will MET use this technology in the future?

Phase 1 FY2021

- November 2020 – February 2021
- Reviewed Eastern Shore solely held portfolio and imagery
- ~140 properties/imagery reviews
- 14 reviewers: staff, Board & volunteers

Phase 2 FY2021 – FY2022

- March 2021 – December 2021
- Western Shore solely held portfolio and those co-held with low frequency reporting cooperators
- ~430 properties/imagery reviews
- Thanks to TNC & LTA grant ringing on LSLT and their purchased easement portfolio

Phase 3 FY2022

- CY 2022...
- Stay tuned for LT Roundtable early next year which will discuss the pilot, preparation steps, and lessons learned
- Going forward, MET will be examining what is the optimal frequency of on-the-ground versus remote monitoring.

Blended Monitoring Plan

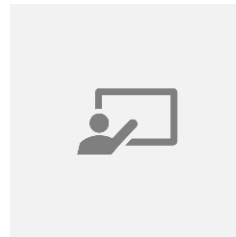
For MET, the solution to monitoring is solved with by a blend of options, including aerial reviews, on-the-ground monitoring and visits conducted by co-holding partners.

We salute land trust cooperators for all the work you do to help us reach our goals!



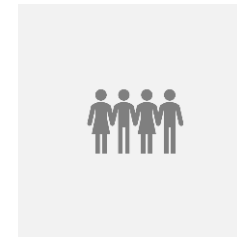
Aerial

Via Lens, MET is reviewing 430 Western Shore properties during the second phase of remote monitoring.



Ground

MET volunteers and staff will continue to conduct regular on-the-ground visits as well as other routine stewardship visits.



Partners

MET relies on its co-holding partners to conduct visits on more than half of its protected lands portfolio.

Summary

- MET has successfully used Lens to review imagery and generate monitoring reports for our easement properties.
- 344 properties were reviewed using Lens in FY2021, and MET plans to complete an additional reviews by the end of December 2021.
- Going forward, MET will be examining what the optimal frequency of on-the-ground versus remote monitoring will be. Also, how to maintain landowner relationships while using remote monitoring technology.
- MET and LSLT will use satellite imagery to monitor 70,900 acres in the Chesapeake watershed this year. In early 2022, they will make a joint presentation of their findings at a Land Trust Roundtable. Stay tuned for more details!

Thank You

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 <https://dnr.maryland.gov/met>