Drones on Smaller-acreage Woodlands

by Lauren Grand, OSU Forestry & Natural Resources
Lane County Extension Service

Drones are becoming more popular to use in forestry. With recent innovations, small landowners are beginning to gain more affordable access to this useful new technology. I spoke to Cory Garms, a PhD student at Oregon State University, about what small-acreage landowners might want to know about using drones to survey their own property.

What is a drone?
The terms drone and UAV (unmanned aerial vehicle) are used interchangeably to describe remote-controlled aircraft platforms which vary from the size of a hummingbird to that of passenger planes and beyond. The two main types of UAVs are multicopter and fixed-wing, which have unique strengths and weaknesses for flight much like helicopters and airplanes. The term UAS (unmanned aerial system) refers to an aircraft (UAV) in addition to the positioning hardware and sensor payload which enable the aircraft to orient itself and collect data, respectively. The applications of this technology are seemingly endless, but at OSU I use them to carry specialized cameras in order to monitor forests and agricultural crops.

What are some common uses for drones in forestry today?
The uses are already quite diverse and they will continue to grow. Initially, I think foresters were pleased to use them to make high resolution aerial maps of their forests for a fraction of the cost of hiring an airplane pilot. With the advent of sufficiently small and light multispectral and thermal infrared sensors, the scope of data we can collect from UAS has grown from visual maps into “stress” maps which help make inferences about the relative health of individual trees. Another exciting technology, LiDAR, allows us to make remarkably accurate 3D reconstructions of forest scenes which can be used to measure tree dimensions with a high level of confidence. There is also a push to develop UAS for applying chemicals like herbicides and fertilizers.

How might small-acreage forest landowners use drones in their management planning?
Small forest landowners have lots of reasons to get involved in drones. The most straightforward one is for silvicultural planning using aerial maps. With a little familiarity they would be able to make scaled maps of their land that include tree height and spacing data that are extremely useful when choosing when to thin and when to cut. At a small scale, single tree selection would probably be less costly and definitely be much faster using UAS. The necessary hardware for this level of analysis cost is under $2,000. Another option is attaching a more expensive ($5-10K) multispectral sensor, which could allow the landowner to visualize the “stress responses” of individual trees. This gives researchers the ability to make inferences about drought, disease, and nutrient deficiencies. In a broad sense, this will likely become a vital early detection tool for foresters.

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(continued on p. 2)
Additional uses to carry out your management plan (added by Lauren):

Streamline monitoring – if you have a large forest or don’t get out to all the corners often, you could use your drone to monitor for extensive storm damage such as windthrow, look for health and disease issues (i.e. drought or root rot), or do a post operation assessment (is slash piling necessary?).

Document actions – record keeping for your management plan just got more exciting! Get before and after photos of a recent thinning or harvest, newly built roads, added ponds, or restoration of an oak woodland.

Reduce your risk to wildfire – Identify areas that have high fuel loads and monitor areas where you have done some fuels reduction to stay on top of maintenance.

What are the benefits to small acreage forest landowners in hiring a professional consultant that uses drone technology?

The first step to implementing drones on your forest needs to be learning about them. Hiring a professional would, at the very least, give a landowner the ability to see how flight operations work and begin looking at the products we are capable of creating with these tools. My personal outlook is that small forest managers, like small farmers, are “do-it-yourselfers” who would ultimately like to own and operate their own equipment. Some of the best companies are willing to educate clients and teach them to collect the data themselves. This framework allows the landowner to spend a little more on quality data analytics software to help them make decisions based on their imagery.

What are some of the regulations that small landowners need to be aware of when using drone technology?

The most important thing that people should be aware of is the FAA’s small UAS rule (14 CFR part 107), which establishes the requirements for registration as a certified remote pilot in the United States. The certification exam covers some of the same information about aeronautical charts and weather reports that you would find on a small aircraft pilot exam, as well as the rules that deal specifically with small UAS. Legally, it is only necessary to have the part 107 license if you use UAS commercially, but I recommend it for a couple of reasons. First, studying for it will make someone a better pilot regardless of how experienced they are. The study materials are useful in the field and the certification process is a good way to start thinking of the drones as aircraft rather than as toys. Second, the exam itself has only been around since January 2017, and since the guidelines say you must recertify every 2 years, no one has had to do it yet. Basically, I expect that now is the best time to get the license because it will not get any cheaper (now $150) nor any easier down the road. I would, at the very least, make sure that any pilot I hired held a current part 107 license. Visit the FAA’s website for more information about how to certify.

How are drones being used in forestry research?

In a relatively short time, drones have made a large footprint in the forest research community. There are studies that deal with all kinds of things: chemical application, pest and disease detection, tree counts, size measurements, fire studies, species ID, drought detection, invasive...
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**OSU Extension Online Calendars**

**Benton, Linn, and Polk Counties events:**
http://extension.oregonstate.edu/benton/forestry/events

Sign up for the Compass and Needle mailing list to receive an email notice when an event is scheduled.

Contact Jody Einerson:
jody.einerson@oregonstate.edu
541-766-6750

**Lane County events:**
http://extension.oregonstate.edu/lane/upcoming-classes-events

Contact Lauren Grand:
lauran.grand@oregonstate.edu
541-579-2150

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**Upcoming Events**

**Society of American Foresters Annual Convention:** **October 3-7.** Portland, Oregon.

**Lamers Forest Property Tour:** **Saturday, October 6,** 8:30-3:30, https://extension.oregonstate.edu/benton.

**Linn County Woodlands Info Workshop:** **Thursday, October 11,** 7-9 pm. See info p. 6.

**Fall Slash Burning Demonstration at Lamers Forest:** **Date tbd October 15 -November 15.** RSVP required before October 6. See info at https://extension.oregonstate.edu/benton.

**Revisiting the 2014 Ice Damage:** **Tuesday, October 16,** 8 am-3 pm, Gary Springer, Starker Forest. RSVP: 541-766-6759 by October 12, 10 am. See info p. 10.

**Woodland Measurements Workshop:** **Saturday, October 2,** 8:30 am, Dave Hibbs, S. Polk County. RSVP: 541-766-6759 by October 12, 10 am. See info p. 10.

**Annual Oregon Tree Farm System Meeting:** **Saturday, October 27,** 9 am - 2 pm, The Oregon Garden. See info p. 5.

**Linn County Small Woodlands Association annual Seedling Sale and Goods from the Woods event:** **Saturday, February 2,** 2019, Linn County Fair and Expo Center in Albany. See info p 11.
**Woods Words**

**Antsy**—The condition of having ants in the pants, being over-anxious to get going.

**Armstrong method**—Any work done by hand, not machine.

**Asphalt logger**—a. One who prefers town to the woods. b. One who makes big talk in town, small work on the job.

**Back cut**—In falling timber, the final cut put in a tree after the undercut has been completed.

**Bad order**—Originally a railroad car in need of repairs, now used to mean anything in the camp which is broken or not in shape to work, either men or machines.

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OREGON TREE FARM SYSTEM, INC
2018 Recognition Luncheon Workshop and Annual Meeting

Date: Saturday, Oct. 27, 2018
Time: 9:00 a.m. – 2:00 p.m.
Place: The Oregon Garden,
J. Frank Schmidt Pavilion,
879 W. Main St., Silverton

Sponsors:
Oregon Tree Farm System, Inc
Oregon Small Woodlands Association
U.S. Forest Service
Oregon Department of Forestry
Oregon Forest Resources Institute
OSU Forestry & Natural Resources
Extension Sustainable Forestry Initiative

Tree Farmers Workshop (Indoors)
Vegetation Control on Your Forest
Time: 9:00 – 11:00 a.m.
Place: The Oregon Garden-J. Frank Schmidt Pavilion
Speakers:
1. Why do vegetation control in your forest?, Julie Woodward, Oregon Forest Resources Institute
2. Compliance and record management for certification, Jay Walters, Oregon Department of Forestry
3. Lessons learned from the tree farm, Nancy Hathaway, Benton County Tree Farmer
4. Forest vegetation control for ground-based herbicide application, Eric Hippler, Wilbur-Ellis
5. When to hire a contractor and useful checklists, Brad Withrow-Robinson, OSU Extension
6. Communicating with neighbors, Seth Barnes, Oregon Forest & Industries Council

Tour of World-Class Conifer Garden
Time: 10:00 – 11:00 a.m.
Place: Start at J. Frank Schmidt Pavilion
Focus: Outdoor walking tour of the world-class conifer garden at The Oregon Garden, with a passionate curator who seeks conifers from around the world. The conifer collection was built in partnership with the Western Region of the American Conifer Society (ACS).

OTFS Annual Business Meeting
Time: 11:00-11:30 a.m.
Place: J. Frank Schmidt Pavilion

For more information, contact Jim James at 503-588-1813 or jimjamesoswa@yahoo.com
Send your completed registration, along with fees, to the OTFS office.

The Cafferata Family, 2017 Tree Farmers of the Year, with OTFS, ODF and USFS representatives
Sometimes tree farmers learn about their forests through a walk in the woods. We toured the Cota and Melcher’s Fun Forest tree farm in August, learning about optional uses for our forest. The internet can be another place to find out about your local trees and possible activities related to them. Our Linn County chapter established a website earlier this year. It not only has dates of meetings and events, it is a path the members can take to get information on chapter business. The web site is also a way for our members to keep in touch throughout the year. We would like to add information on projects you are working on. Jim Merzenich, our web page manager, can be reached at jim@oakbasin.com. Please share your successes and things that did not go so well.

The Oregon Forest Resources Institute (www.oregonforests.org) provides another venue to gather information through their “Know Your Forest” site, at https://knowyourforest.org. It has 2015 timber production records for the county, as well as information about who is growing trees and who is cutting trees. It turns out that small private woodlands account for 9 percent of the Linn County forest land—about 22,000 acres—but provide just 7 percent of the timber harvest. There are about 3,300 jobs in the county connected to the timber industry. For those of us who are interested in the history of logging and production, Oregon State University has a PDF online that contains the federal timber survey of 1944 (http://scarc.library.oregonstate.edu/findingaids/index.php?o=collections/findingaid&id=1969-id142867). The document includes maps and historic tidbits about the huge expansion of the timber industry at that time into the watersheds of eastern Linn County.

What: Woodlands Info Workshop
When: Thursday October 11; 7-9PM
Where: OSU Extension classroom Tangent (Hwy 34/ McFarland Dr., Tangent, OR)

Linn County Chapter would like to announce a Woodlands Workshop Information night at the OSU Extension classroom in Tangent.
Guest speaker(s) to be determined, watch the Needle and Compass for details. Break between speakers to include desserts and coffee.

Linn County Picnic
by Larry Mauter

There was an emphasis on “fun” at the Aug. 19 Linn County Small Woodlands Association summer picnic. Close to 40 members attended this year — meeting at “Fun Forest” for a tree farm tour followed by a picnic lunch. The day was hosted by the Melcher and Cota families, who together farm about 2,000 acres. “Fun Forest” is located off Upper Berlin Road. The families started together in 1999 with 320 acres, adding and transforming 12 poorly stocked parcels through the years.

Today, visitors can find a weekend bow shoot between April and late August with life-size 3-D target elk, deer, and other critters. There is a spring-fed 1/3 acre
trout pond, camping and now a restored wooden barn and picnic area. Horseback riding, hiking and organized forest tours are among activities on the property.

LCSWA board member Jim Cota, along with Scott and Mike Melcher, led visitors on a wagon tour of the property, surveying Douglas-fir stands of varying ages and seeing the results of varied thinning techniques. Pockets of hardwoods exist where terrain dictates.

Stops included the seasonal 3D target bow hunt operation, which includes camping. The deep spring-fed pond was another picture point, as well as a plot that was a Christmas tree planting 35 years ago.

The Melcher and Cota families supplied beverages, grilled burgers and foot-long dogs, with Mike Melcher on the grill. Members brought pot-luck hot and cold side dishes along with an array of desserts.

Since its start in 1999, Scott Melcher told the gathering, his family has “developed a passion for this place.” He explained the activities for family members and close friends on the site are “the kind of things that make tree farming fun.” That includes holding gathering at the restored 1940s-era barn. The Melcher Logging company picnic was held at the barn the day before the OSWA summer picnic. Activities that day included an industrial size slip-and-slide for the youngsters on hand, fed by a 4,000 gallon fire tanker.

The barn itself, with electricity, smokers and a bar built from recycled materials was initiated July 21 with a Melcher family wedding that included 300 guests.

Chapter president Bill Bowling brought mitts, balls, a Frisbee and other games for the event. He led a round of appreciative applause for the hosts.

At this year’s Linn County picnic both the Udell and Melcher families were represented by three generations.
Lincoln County Chapter News

President's Update by Peter Bregman

Not only is *Hot Summer Days* a summer event in Reno, Nevada each year featuring hot-air balloons rides and other significant events in town, we have been experiencing **hot summer days** here in the Northwest and California. There will be more than two million acres destroyed by fire by the time you get this Quarterly Bark issue.

Our hot summer days have a dark side—thousands of homes destroyed, most victims with just the clothes on their backs. Some don’t even have a car left. It all burned up! We flew over some of these stricken areas and saw whole subdivisions burned out, with maybe a house or two left that escaped the fire. The reconstruction demands for all that destruction, to be funded partially by insurance, loans, or cash in savings, is incomprehensible. This is particularly when one considers how old many of the victims are. I was 62 when we built our home in Waldport in a cleared area. We planted new trees that are now 15 to 20 ft tall. If it all burned in a fire, I don’t think that I could muster the energy to start over again.

The devastation carries a heavy price tag that we all will be sharing, one way or another. My homeowners and car insurance this year went up by 15%. My agent told me that we will all share the increases in home owners’ insurance as part of the cost for the many homes destroyed. There has been a heavy load on the insurance industry, not only from the fires in the west but also from the extreme weather events in the eastern U.S.

We are glad that we live here on the coast in Waldport and own an asbestos forest with a lower probability for fire, but I have taken precautions by having protection of a fire zone around my home and firefighting equipment to fight fire should it be needed.

This would be a good place to update you on our annual OSWA meeting. On Thursday, June 28, the first day of our meeting was, to me, the most valuable. We seized the opportunity to visit Seneca Sawmill in Eugene. It grew from a small sawmill to the successful company it is today. It turns logs into a 100% utilized product. The logs are first debarked, then rolled into the sawmill. An electronic picture is taken of each log and analyzed by a computer that decides what the most profitable cuts will be. The log is cut in one way and then the saw comes back the other way for the cross cuts, all of which is determined by computers to determine the best utilization of that log. The scrap is separated and sent to the co-generation plant operated by Seneca Sustainable Energy.

The Seneca Sustainable Energy is one the largest energy-producing facilities operating on a mill site in the United States. They produce sustainable energy for 15,000 homes, in addition to providing the energy for the dry kilns on site. This process of utilizing 100% of what comes into the mill is fascinating to me. Todd Payne was our group tour guide. Having spent most of his career with Seneca,
he is one of three people that understand every part of the operation. It was a very well-organized tour, allowing us to listen and ask questions by using earphones that blocked out noise from the equipment. We ended the tour at the Seneca Sustainable Energy co-generation plant, where we witnessed the dumping of a truck load of hog fuel. The truck was locked onto the dock and the whole load AND truck were raised to a vertical position, emptying its contents on a conveyor belt that moved the material to a covered holding facility.

It was great to see the whole operation, and it confirmed my feeling that instead of burning all our slash, there should be small generating facilities in harvestable areas, where our slash and other products from the forest floors can be brought to that plant for a “controlled burn”, cleaning our forest in a way that reduces the fire hazards instead of uncontrolled fires.

With hundreds of millions spent on fighting forest fires, we could subsidize the process if we were to cut the number of uncontrollable fires by 50%. The cost for this would be far less than the way we handle it now, not to mention the billions in losses by the insurance companies for which we ultimately will pay in insurance premiums.

Lincoln County Measure 21 is still in the courts, and it may be a long time before it is resolved. There is a similar and a broader initiative proposed by the same group in Lane County. You all know that I am from the central valley in California, the region from which much of the good wine comes from. The area does not have this kind of conflict, even with helicopters spraying herbicides on the grapes and other crops. There is no conflict between two opposing groups that we see here in Oregon. Maybe it’s because we like to drink wine together that we are more tolerant of one another. There are economic ties between these two groups, and as in Oregon, rules are in place for protecting all residents from exposure to any negative effects from spraying. Aerial spraying is a common practice in the San Joaquin Valley that occurs yearly without the conflicts that we

My final comment for this quarter is that I would like to add my opinion to the previous paragraph with which you may not agree. I have seen changes since we came here, 16 years ago, in the growth of our communities. This growth demands clear cutting of trees to make room for new roads, shopping centers, manufacturing facilities, and parks and facilities for recreation. There is more intensive use of pesticides by the urban community than ever before. In addition, we have increased waste from urban communities, pollution caused by increased traffic, and an increase in sewage. Even though it is processed, more and more waste is dumped into our waters, not to mention an increase in forest fires caused by careless humans oblivious to fire danger. The end result of all this development results is a reduction in land once designated for forest or agricultural use. There is a loss of wildlife habitat with human encounters. Well, I guess that’s a part of evolution, but there should be more effort in implementing smart growth and educating newcomers in the value of Oregon’s natural resource industries.

I am sure if I think longer I can come up with more reasons why our state needs protection from the intrusion of the urbanites who are not aware of the conflicts they create for those who live here. People who already live here, who have managed the land for 100s of years and have willingly adapted to change are now being forced to change at a more rapid pace. The newcomers who bring their lifestyle here seem totally unaware of the negative changes they have brought with them, changing a land once covered with “air cleaning growth”, now being developed. These areas are now sources of pollution coming from their cars, motor homes, as well as from many other household and industrial pollutants. We all know that a lot of damage was done to the land for survival by initial settlers who didn’t think about their impact on later generations. The natural resource communities today, forestry and farming, are aware of our actions and we take care of the land. We focus our responsibility on our communities and can be proud of our contributions.

(continued on p. 12)
Benton County Chapter News

Upcoming Events
by David Ehlers

Revisiting the November 2014 Ice Storm (Rescheduled)
Gary Springer   Starker Forests
Date: Tuesday, October 16
Time: 8:00am – 3:00pm
Location: Benton County, Coast Range. Details provided upon registration.
RSVP: 541-766-6750 by 10 am, October 12. Space is limited.
We will visit areas on public and private land that were heavily impacted by the November 2014 Coast Range ice storm for a “rear view mirror” look at forest management. We will learn what landowners did to mitigate the timber damage and how their decisions have panned out, four years later. This is a joint tour with Marys Peak SAF, Benton County Small Woodlands, OSU Forestry & Natural Resources Extension and College Forests.
Transportation will be provided, but bring your own lunch, water and clothing appropriate for weather of the day.

Woodland Measurements Workshop
Dave Hibbs   Cedar Spring Tree Farm
Date: Saturday, October 20
Time: 8:30 carpool for a 9:00 start at location. Will be done at noon.
Location: S. Polk County. Details provided upon registration.
RSVP: 541-766-6750 by 10 am Wednesday, October 17. Space is limited.
Knowing something about what you have in the woods is important. If you are selling trees, you will want to know the volume in the stands to be harvested. If you are thinking about stand density and thinning, you will want to know how crowded your stands are. Join Dave Hibbs for a hands-on field class that will look at ways to collect and analyze both density and volume data.
Sponsored by Benton County Small Woodlands and OSU Forestry & Natural Resources Extension. We will be in the woods most of the time, so please dress accordingly.

Annual Oregon Tree Farm System Meeting
The Oregon Garden
Saturday 10/27/18
Time: 9 am - 2 pm

A Tribute to Marsha Carr
by Karen Fleck Harding

The passing of our dear friend, Marsha Carr, on September 9, is such a loss for so many people, from the Oakes, Carr, and Johnson families to her many friends, including many woodland owners.
Since 2003, Marsha has been a member and an inspirational leader of Oregon Small Woodlands Association and our Benton County Chapter. Marsha took on some of the most challenging jobs. As Membership Chair, she enjoyed reaching out to new and ongoing members, sharing her enthusiasm for the organization and promoting the many benefits of membership. You may remember receiving friendly phone calls from Marsha. As liaison to the statewide OSWA Board, Marsha always kept our chapter up-to-date and well informed.
Marsha and her family were recognized as the 2018 Benton County Tree Farmers of the Year. They hosted the OSWA Neighbor to Neighbor Woods Tour on May 19 of this year, where we experienced a rich family history of six generations of commitment to their family forestland, beginning back in 1883.
Marsha attended almost every Benton Small Woodlands tour, often accompanied by her dad, Don Oakes. She was passionate about good forestry practices and applied them to her family’s land. Marsha was courageous in tackling new ideas and seeing them through. She strove to keep her family moving forward with new techniques and information. Marsha was a personal inspiration to me in how she encouraged her grandchildren’s interest in forest management. I fully expect that her passion will live on through her children and grandchildren, whose interest in their family forest was sparked by Marsha’s love and enthusiasm. ◆
species management, planting, and more. The Unmanned Aerial Systems lab at OSU has been involved in a wide breadth of projects also, including Swiss Needle Cast disease detection, southwestern white pine drought tolerance, using LiDAR to estimate forest inventory, tree height estimations, herbicide efficacy estimation, and others. Personally, I am interested in how we can use multispectral and thermal sensors to decide when plants need water, not only in forestry but in agriculture as well.

What should small landowners consider before purchasing a drone?

Because there are so many options, I would say first decide on a budget, then use that as a guide. If you just want to make maps of forest stands, that could be accomplished relatively inexpensively, whereas making precise tree measurements or any sort of health estimates typically requires more expensive hardware. Remember that the quality of these machines is rising as their cost is falling, so it will be cheaper to achieve the same results in years to come.

For more information:
Unmanned Aerial Vehicles (Drones): How they operate and their potential for improving your forest and rangeland management (EM9190). https://catalog.extension.oregonstate.edu/em9190
FAA Unmanned Aircraft Systems: https://www.faa.gov/uas/

Upcoming Linn Co. Seedling Sale and Goods from the Woods
by Bonnie Marshall

Linn County Small Woodlands Association will host its annual Seedling Sale and Goods from the Woods event on Saturday, February 2, 2019 at the Linn County Fair and Expo Center in Albany. Now is the time to put it on your calendar and be thinking about what trees or shrubs you might want to pre-order for your spring planting needs. As in previous years, there will be a good selection of both conifer and deciduous trees, as well as some native shrubs available.

Pre-order information packets will be sent out in mid-to-late November via e-mail (or snail mail if you don’t use an e-mail address). If you would like to be added to our e-mail list or help at the sale, please contact Bonnie Marshall at bonnieym@wvi.com, or (503) 769-6510 for snail mail additions.

More information about the Goods from the Woods event, which features displays of wood, wood products and wood artwork, will be published by OSU Extension later this fall.
The big timber companies that own large sections of land have too much to lose by not managing their property to preserve it and are very careful to adhere to forest sustainability to protect their investment. Weyerhaeuser, the company that lost a lot of standing timber when Mt. St. Helen blew her top, is a very good example of how they restored their land versus the land owned by the government. Weyerhaeuser land was restored and now has a crop of timber that is an asset to the community.

I would like to close my comments in stating my appreciation to all those timber companies that participated in sponsoring OSWA's annual meeting. Their names are too many to list here but they were listed in the OSWA newsletter. ☚