THE VEGETATION MANAGER magazine 2021

NEW TECHNOLOGY IN VEGETATION MANAGEMENT

UTILITY FOCUSED TECHNOLOGY

MODERNIZING BUSINESS

AERI-TULANE LAW SCHOOL UVM LAW RESEARCH PROJECT: PART 1

DRONE SPRAYING



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PRESIDENT'S REPORT BPVMA



- LISA RYBCHUK, PRESIDENT PVMA



As the seasons change, we have the opportunity to reflect on the past and prepare for the upcoming work ahead. For some, this change is a welcome relief to a somewhat challenging season! From the spring rains to the summer drought, we witnessed the results of these stressors to vegetation; making them less resistant to insects and disease and impacting the effective use of herbicides.

These challenges were not limited to the weather,

however, as we continued to see the impact of Covid-19. Aside from the obvious health effects, it has impacted the ability to recruit and retain staff as well as led to decreased business in much of the industry. Embracing change seems to be the key to success and the PVMA continues to adapt and seek out new and improved approaches to the challenges that we face.

One such change was to the delivery of the UTT/UTW program, with a new blended program of both in-class and virtual delivery. In this manner, the theory portion could be converted to an online format while preserving the delivery of the in-person field evaluations in a safe and efficient manner.

Another change of note is the signing of a short-term agreement between the PVMA and IVMA Man/Sask to provide them with administrative support while they undergo changes of their own. The PVMA recognizes the importance of the vegetation management industries and associations demonstrating a unified front and strength in numbers for the industry as a whole.

In keeping with the theme of embracing change, the PVMA will once again be offering another virtual-platform workshop this Fall on the topic of New Technology in the Vegetation Management Industry on October 20th, 2021. We look forward to hearing from these experts in their fields and we hope that you will join us for this FREE event for PVMA members. Wishing you continued health and happiness -

Lisa Rybchuk, PVMA President

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AdvantageVM was founded in 2016, and since then, we have expanded to serve clients across Canada. Having the chance to share our expertise and knowledge has been an extremely valuable experience, and we look forward to continually serving the Vegetation Management Community with the specialized skill set our team possesses. We will continue serving you in an affordable and efficient manner — one that not only meets your expectations but exceeds them as well.

So, thank you, once again, from the whole team at AdvantageVM. The dedication and support of our clients means the world to us. We hope to see you in-person soon.

f)(E)

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NEW TECHNOLOGY IN VEGETATION MANAGEMENT

- WADE SMITH, BOB GORDON



THE COVID 19 PANDEMIC HAS CREATED AN EARLY DEMAND FOR NEW TECHNOLOGY IN OUR INDUSTRY. IDEAS, CONCEPTS AND FORMATS THAT WERE CONSIDERED AS TOO EXPENSIVE OR TOO COMPLICATED TO IMPLEMENT HAVE NOW BECOME COMMON PLACE.

SOME EXAMPLES OF THIS ARE THE ORIENTATIONS AND ONBOARDING PROCESSES FOR NEW EMPLOYEES.

- Just a short time ago the concept of having new employees go online and complete the company orientations was not really looked on as the proper way of completing the orientations.
- (How could you be sure that the employee understood what your company requires?)
- Now there are more and more companies that are using online orientations.
- They have lost their fear and insecurities and have taken advantage of the time savings that electronic orientations provide to the company.

IN 2016 SOUTH BROOK SAFETY IN PARTNERSHIP WITH AMHSA DEVELOPED AN ONLINE CHAINSAW AWARENESS COURSE.

They partnered again in 2019 and developed an OHV course (ATV & UTV).

PRE COVID THE THOUGHT PROCESS WAS THAT THESE WERE STRICTLY IN THE FIELD TRAINING COURSES.

- These courses were developed to be the first step in the training to provide students with the why behind the training.
- Online courses are not developed to be the end process in the training circle, but to be the introduction to the topic to support it.
- Online courses that are supported with a practicable field evaluation to evaluate skills have become the norm.

THE CHAINSAW COURSE WAS VERY POPULAR DURING THE COVID SHUT DOWN AS IT WOULD COUNT AS CREDIT FOR THE CLASSROOM PORTION OF CHAINSAW TRAINING. Other benefits of the online training were;

- Saving time, money and exposure risk to other people.
- The practical portion of the course remained the same.
- For the OHV course there is a practical portion as well, it covers pre-ride inspection, a skilled obstacle course, loading and unloading and tie downs.

THE ONLINE COURSE OPTION COMBINED WITH A PRACTICAL SKILL EXAM HAS MADE UTILIZING THIS TYPE OF TRAINING AN OPTION FOR MANY EMPLOYERS TO PROVIDE TRAINING TO THEIR EMPLOYEES.

OTHER PROVIDERS THAT TURNED TO THIS OPTION WERE

- First Aid courses during the COVID shut down were online and then you had to do a practical to finish your certification.
- The PVMA UTT program has started using online presentations as well as practical exams.
- This has been very successful, along with the potential to shorten the time that crews are away from work yet increase their level of education at the same time.

DRONE TECHNOLOGY

- When we look at Drone technology in our industry, the sky is the limit 'excuse the pun'.
- We can fly over large areas, take videos and pictures of vegetation and identify issues.
- We can fly over a park and take inventory of the trees.
- We can fly over a storm damaged area and identify access and the extent of the damage to the inventory.
- After a fire we can assess the risks to the powerline, camp sites or other targets.
- The camera technology of the latest drones is amazing; some of the cameras can cost more than 10k (just for the camera).
- If you want to identify a weed from 30m in the air moving a 30kmh, we can do that.

There is so much more technology that we are using now that was only a dream just a few short years ago. With staff shortages we will embrace ideas that seem too expensive and too complicated to implement.

We will realize that those who embrace these technologies will have an advantage as we march into the future.





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THE AERI-TULANE LAW SCHOOL UVM LAW RESEARCH PROJECT: DEVELOPMENT OF VEGETATION MANAGEMENT LEGAL EXPERTISE

- BY LARRY KAHN, CHERI HASZ & RYAN ANDERSON

My name is Larry Kahn and I am the Chief Compliance Officer of AERI. I'm an attorney with over 25 years of practice, and my introduction to this industry came in 1989 when, as a contracting officer's representative, I drafted and oversaw the vegetation management and hazard tree removal program for the US Army's Land Management Division, where I needed to be concerned not only with conflicts between trees and powerlines, but also with unexploded ordinance. When AERI started up just a few years ago, one of my (many) tasks was to seek out experts who could assist us in organizing, planning, and running the company. In order to do this, we needed to be sure we understood the laws, rules and regulations applicable to all manner of vegetation management work in California. As an attorney myself, I naturally thought a good source for such expertise would be ... other attorneys. But finding attorneys with actual expertise in utility vegetation management laws and regulations proved to be extremely hard. So, I resolved to do the work myself, assuming that there must be a single source I can access that had all the information I needed. Wrong again. There is almost no federal guidance, and every US state does things differently, and even within any single state - including highly regulated California – a lot of the provisions I found were vague and challenging to understand. Finding a friendly authority who could advise on why things are done a particular way was just not an available option, and so our company was left - like I'm assuming most of you - with no alternative but to figure all this out ourselves. We needed to become our own experts.

AERI found this process frustrating, to say the least, and so we resolved to not only become experts ourselves, but to also foster the development of true legal expertise in this industry. But how do you go about doing that? Well, for those of you who've seen the 1987 movie "The Untouchables", Sean Connery delivered a famous line: "if you're afraid of getting a rotten apple, don't go to the barrel: get it off the tree." And with that, I approached my law school, Tulane, for help. As it happened, Tulane Law School was, at the same time, seeking mentorship opportunities for law students in the environmental and energy law disciplines. That effort was being headed up by a very talented second year law student, Ryan Anderson. Within a few days, AERI and Tulane Law School collaborated on the creation of a program that would develop real legal expertise in vegetation management, and the AERI-Tulane Law School Internship in UVM Law Research Project was born. In a project funded by AERI, these Tulane Law Students have engaged in two tasks: First, they have begun compiling information about the laws, rules and regulations applicable to utility vegetation management across North America in what we are calling the "UVM Law Compendium". The research on each US jurisdiction is now nearly complete, and meanwhile Canadian

and Mexican laws, regulations and rules is well underway. We fully expect that by March 2021, we will have the compendium information assembled and available as a research tool. AERI will then generate a report based on the information that has been developed and this report will be delivered to public utility commissions and utilities in each jurisdiction and will be available for download on our website. We plan to continue this project with Tulane Law School to both expand the scope of information developed and to also add additional countries, all while ensuring that any changes to the laws, regulations and rules are also updated in the UVM Law Compendium. The second task undertaken by AERI's Tulane Law School students is the development of independent, peer-reviewed research papers that will be published beginning this spring. The students had the freedom to choose topics entirely on their own and these research papers are being developed now, with an aim of being completed by the end of April 2021.

What do we hope to accomplish by doing this? Well, a few things: 1. WE WANTED TO DEVELOP AN IMPORTANT RESEARCH TOOL – THE UVM LAW COMPENDIUM – WHICH WILL ENSURE THAT EVERYONE IN THE INDUSTRY HAS ACCESS TO WHAT THE LAWS, REGULATIONS AND RULES ACTUALLY SAY, AND CAN THEREFORE GET RELIABLE INFORMATION AND LEGAL ADVICE REGARDING THESE LAWS, REGULATIONS AND RULES.

2. WE WANTED TO DEVELOP A CADRE OF LAWYERS WHO HAVE KNOWLEDGE OF THIS INDUSTRY AND HOW IT FUNCTIONS SO THAT EVERYONE IMPACTED BY VEGETATION MANAGEMENT ISSUES CAN HAVE LAWYERS THEY CAN TURN TO FOR RELIABLE ADVICE.

3. WE WANTED THOSE LAWYERS TO BECOME INTERNATIONALLY RECOGNIZED FOR THEIR EXPERTISE IN THIS AREA AT A YOUNG AGE. AND 4. WE WANTED TO DEVELOP A PLATFORM FOR THE FUTURE. I'M PLEASED TO REPORT THAT WE'RE WELL ON OUR WAY WITH REGARD TO ALL FOUR OF THESE GOALS.

IN THIS ARTICLE YOU WILL HEAR FROM TWO OF THE STUDENTS IN OUR AERI-TULANE LAW SCHOOL UVM LAW RESEARCH PROGRAM: ANOTHER STUDENT WILL BE INVOLVED WITH OUR NEXT ARTICLE COMING UP IN A FUTURE ISSUE OF THE VEGETATION MANAGER MAGAZINE. I HOPE THAT YOU'LL TAKE THE TIME TO READ BOTH ARTICLES: THIS ARTICLE WILL COVER THE WORK THAT AERI UNDERTOOK, ON ITS OWN, TO ADVANCE THE STATE OF LEGAL EXPERTISE TO MEET THE GROWING CHALLENGES IN THIS CHANGING WORLD. THE NEXT ARTICLE WILL ARGUE FOR WHAT THE INDUSTRY CAN DO COLLECTIVELY TO FURTHER DEVELOP THIS DESPERATELY NEEDED EXPERTISE.

My name is Cheri Hasz and I am so glad to have this opportunity to share with you the research we've been conducting on UVM law. Let me start by reviewing in general what we've been researching in connection with Phase I of our project. Before I do that, though, it is important to consider that in the United States, the laws, regulations and rules relating to transmission and distribution are fundamentally different. Partly as a result of the 2003 Northeast Blackout, the federal government imposed very strict UVM standards aimed at preventing conflicts between vegetation and electric transmission. UVM standards relating to electric distribution, though, were left to each individual state or territory to regulate. What we focused on in our research for the compendium, therefore, was the laws, regulations and rules applicable to distribution. It's not that transmission is unimportant, but it is straightforward and is applicable throughout all of the United States. Each US jurisdiction, whether it is a state or a territory, has a regulatory body charged with ensuring the safe and continuous flow of electric distribution to customers within that jurisdiction. The names of these regulatory bodies changes slightly from one state to the next, but by and large they can all be called "public utility commissions" or "PUCs". One of the things that we thought was important to research - even before we got to the rules relating to UVM itself - was how these PUCs are organized and run. The differences we found from jurisdiction to jurisdiction were striking. For example, in Montana, one of the largest states in the country, there are 5 commissioners of the PUC. Each commissioner is elected by the people who live within each of 5 regions within the state, and they serve four-year staggered terms. Every other year, the 5 commissioners select from amongst themselves one commissioner to serve as chair. New Mexico, for now at least, follows the same model, but has imposed a form of term limits in that no commissioner can serve more than two consecutive terms, but could run again after a term has passed. New Mexico, though, will be revising its structure regarding its PUC for 2023, so what develops there in this regard is something to keep an eye on. By contrast, though, Wisconsin has 3 commissioners, all of whom are appointed by the governor for staggered six-year terms, and the governor selects the chair of the PUC to serve for a two-year term. So what's clear here is that some states elect their commissioners and other states have their commissioners appointed by the governor. My research showed a fairly even split between elections and appointments, and there doesn't seem to be any connection between whether that state is traditionally "red" or "blue" with whether the commissioners are elected or appointed.

Why does it matter how the commissioners get their seats? Well, in theory at least, a commissioner who is elected should be answerable to his or her constituents. An elected commissioner – in order to win reelection next time – should be very concerned with whether the region that elected him or her is having any electric distribution problems or other issues relating to continuous and safe flow of electricity. A commissioner who is appointed, on the other hand, is loyal to the governor and the governor's political party. An appointed commissioner will be more concerned with the broader political implications stemming from power outages and will be more concerned with the impact of regulatory changes on the political environment in the state. It is also possible that the commissioners appointed by the governor could all

come from the same or roughly similar parts of the state, resulting in potential favoritism toward the regions that they are from. Take Utah, for example: all three of the governor's appointed commissioners are from Salt Lake City. Elected commissioners don't necessarily ensure a process that is free from favoritism either, though. Take Oklahoma as an example of a state with elected PUC commissioners. Oklahoma is dominated by conservative "red" voters in statewide elections, and a look at the map of Oklahoma appears to be primarily red. However, Oklahoma's major population centers in Oklahoma City, Tulsa and Norman all vote blue. Depending on the way the regions are set up, this could result in a disproportionately large or disproportionately small amount of power for these geographically small areas that host the preponderance of the population.

Turning next to UVM law itself, our starting point was NESC 218. This is a model law which provides that "trees that may interfere with ungrounded supply conductors should be trimmed or removed." This electric code provides the basis for trimming and removing trees that interfere with powerlines. You might think that this concept is simple and straightforward enough that it would enjoy universal adoption. However, of the sixteen jurisdictions I researched, four of them - meaning a full 25% - have not adopted this code. Those jurisdictions are Washington, DC, the US Virgin Islands, South Dakota, and Oklahoma. Puerto Rico is currently in the process of completely revising its legal and regulatory structure relating to electric distribution and so whether it will or will not adopt NESC 218 remains to be seen. NESC 218 was not drafted by any legislature, though, and it is subject to change and amendment. Some jurisdictions I studied, such as Wyoming, automatically adopt the latest version of NESC 218, without study or debate. Presumably the Wyoming legislature felt that if the experts recommended a change in this law then they had no reason to question it. On the other hand, North Dakota will not adopt new versions of NESC 218 unless debate on the changes is held first. In many of the jurisdictions I researched, NESC 218 is either the only - or at least among the very few - laws that actually compels utilities to perform tree trimming work. And, frankly, even that authority is somewhat strange. If you look at the actual wording of NESC 218, what you see is remarkably vague. The main language provides that trees which interfere with conductors "should" be trimmed or removed. Should? Really? If I was the chief financial officer of a utility company and I saw that requirement, my recommendation to the utility company would have to be that there is nothing in NESC 218 that actually compels any tree work to be done, and so would say that the utility should simply not spend any money doing any tree work and instead consider those savings as profit - after all, utilities are profitmaking companies and have a responsibility to their shareholders to maximize profitability. If I was the general counsel of the same utility, though, I might look at "should" differently. In that case, I would say that "should" puts the utility in a precarious liability position. While the utility is not compelled to do tree work, it is going to be in a lot of trouble if a tree that it should have trimmed pursuant to NESC 218 becomes a problem and causes an outage, property damage, injury or death. I could see how it would be quite easy for a plaintiff's attorney to say that the statute said the utility "should" cut such a tree and that by placing profits ahead of safety, the utility made a conscious - and therefore

reckless – choice against the interest of the victim. Who's right? Me the financial officer or me the general counsel? Well, the answer is actually both, and neither, at the same time. And that, for a utility, is a very uncomfortable position to find yourself in.

Another piece of legislation that compels tree work in the United States jurisdictions I researched is the Urban-Wildlife Interface Code. This Code, like NESC-218, is not drafted by legislatures but instead was drafted by a group of experts, and generally speaking it requires the removal of all vegetation within 10 feet of a power pole with equipment attached to it. Enactment of this Code is not mandatory anywhere, it is simply recommended. What I found was that there was absolutely no consistency among the sixteen US jurisdictions I studied. New Mexico, for example, adopted the Code but left enactment to the individual counties, meaning each county had the choice to implement the Code or not, and, predictably, some counties enacted it, and others didn't. South Dakota adopted the Code but left it up to individual municipalities to enact or not, and currently, only one municipality in all of South Dakota has enacted the Code, which means that the utility providing service to that municipality is required to comply with the UWIC, but only within the geographic boundaries of that municipality. A municipality, by the way, with only about 3,000 people and which covers a total land area of only about 2 square miles (or 5 square kilometers). I'm curious to find out whether that utility simply applies the Code everywhere, or if it really does do things differently within that one tiny municipality. Getting back to the UWIC itself, North Dakota, Wisconsin, Kansas and Wyoming have declined to enact it. Oklahoma has also declined to enact the UWIC, but three small municipalities have enacted it anyway, and the City of Tulsa – known as a center for energy – has incorporated the UWIC too, but only as part of its municipal hazard mitigation plan. On the other hand, Colorado and Arizona have both fully enacted the UWIC statewide.

The research we did for AERI for the UVM Law Compendium was extensive and covered dozens and dozens of different legal points. It is clear that based on the information that will be fully developed by the end of this month, the Compendium will be a fantastic resource for this industry. Once the compendium is complete, a report will be issued that will be available on AERI's website.

Now, given the impact of the polar vortex that struck Texas in February, its more than fair to expect me, a Houston native, to update you on what happened. The first thing I can tell you is that even though trees were definitely impacted by the severe cold winter weather we experienced, the reason for the power loss and associated problems was not primarily a UVM problem. It was instead, for the most part, a failure to winterize the power generation equipment which caused a shortage of energy production. The initial reports that circulated saying that windmills and solar panels don't work in cold wintry conditions were simply not correct – there are, after all, solar panels and windmills that function year-round in Antarctica. I'd like to turn now to the subject of my paper, even though it isn't fully written yet. My research into Texas law through the work I did with AERI showed that the Texas PUC has largely devolved its regulatory mandate as concerns UVM to

the individual municipalities throughout Texas. What this has resulted in is a municipality-by-municipality patchwork of different regulations all across the state of Texas. Texas has 10 investor-owned utilities, and the standards applied by these utilities in regard to vegetation management vary significantly from utility to utility. This is because NESC 218, which is enacted in Texas, is vague enough to be subject to many different interpretations. I spoke with the senior counsel of one of these utilities, and he told me that the utility itself mandates a 10 foot clearance from the powerlines. NESC 218 doesn't specifically require a 10 foot clearance, but in the experience of the utility, 10 feet is what is needed. He said that with a 10 foot clearance rigorously enforced by his utility, they have escaped significant UVM-related outages, fires, electrocutions and other damage for many years. He related to me that there was a time when, under a different administration of the utility, an effort at cost savings occurred, and the utility shrunk the clearance from 10 feet down to only 7 feet. Within one growth cycle, the number of outages and property damage cases climbed exponentially, and the damages tracing to this change far exceeded the savings on expenditures for vegetation management. The utility thereafter promptly returned to a 10 foot clearance, and the instances of outages and property damage cases dropped immediately thereafter. I also asked about how the utility addressed UVM changes from one municipality to the next. He confirmed that while the situation has the potential to be a tangled legal mess, in actuality, for now at least, it isn't. That's because very few municipalities actually have any vegetation management expertise and so as a result, very few of them have passed any sort of regulatory requirements concerning UVM. And with those that have, the standards they passed were below what his utility was already doing anyway. Because his utility is very proactive with vegetation management, they have fewer incidents, but do have higher costs. This creates an unfavorable comparison with other Texas utilities from a cost per kilowatt hour perspective, but on the other hand creates a favorable comparison to those same utilities from a SAIDI and SAIFI (reliability) perspective. Which brings me to my paper.

My thesis is this: Texas holds itself out to the world as "good for business", but without a proper regulatory environment that ensures the safe and continuous flow of electricity, this claim will sound hollow, particularly in light of recent events. Instead, I think a strong business case can be made for the establishment of clear regulatory rules for UVM, and that if presented correctly, even Texas's cultural aversion to regulations can be overcome. Now Texas is near and dear to me, and so even though Texas is the focus of my thesis, you should consider that probably a similar business case can be made in each of your jurisdictions. Let me start here. Texas has engaged in a vigorous international campaign to lure businesses to come to Texas. The state sells its generally favorable climate, its advanced transportation network, its growing metro areas, low cost of living, well educated workforce, favorable tax structure (there is no income tax in Texas) and other factors as bases for companies to relocate. All of these are fair points to raise. But one thing that nearly all businesses need is safe and reliable electric power. But if the Texas PUC doesn't actively regulate UVM, and instead allows each municipality and each utility to essentially do its own thing relating to vegetation, then the

reliability of electricity in some places in Texas is greater than others, and in fact the electric reliability in some parts of Texas is worse than in places like New York, Boston, Chicago and other major metro areas. Compounding this problem is the fact that severe weather events have been impacting Texas with increasing frequency and severity. Texas' southern Gulf Coast has been hit by ever larger and more damaging hurricanes. The center and western areas of Texas have been plagued by drought and wildfires, and north Texas has experienced ice storms and tornadoes on a regular basis, with what happened statewide just two weeks ago being an extreme example. All of these severe weather events impact trees and cause outages, fires, damage, and injuries. My preliminary research so far showed that up until now, companies looking at a potential move to Texas have not even considered electricity-related matters as impacting a decision to move to Texas. I believe, though, that after this most recent experience, companies will start questioning the reliability of electric power in Texas. Without reliable electric service, their companies won't be able to function, and their costs for insurance - particularly business interruption insurance - will be comparatively higher. And, frankly, the executives considering a move of their companies to Texas probably don't want to expose themselves or their families to prolonged outages and the associated lack of safe drinking water that we've seen in the last few weeks. It simply won't be acceptable to them and they'll pass on such a relocation. Hearings concerning this most recent power failure are starting to be held now. It will take some bravery for the PUC to acknowledge that it could have done more, and it will take guts to not only address the winterization of equipment problem but to take a broader view of what should also be done to strengthen the system by better regulating UVM, but if there was ever a time to do that, now would be the time. We Texans are well-known for our bravery, grit and determination, and so I have every reason to hope that our PUC will do the right thing here, if it has access to the right tools and information. The Texas PUC will need expertise to assist it in this regard, and the kind of expertise that we are developing here is exactly what will help. If the Texas PUC looks at the situation honestly, it will see that west Texas suffers from the same types of problems as California and so needs UVM regulation that will protect the state from fire, while east Texas suffers from the same types of problems as Florida and so needs UVM regulation and system hardening that will protect the state from severe storms.

What will it cost ratepayers to implement these regulatory changes? Well, that depends in part on the utility providing the service. At least one Texas utility already complies with California-style requirements, and so the cost of new regulations there would be negligible. At other utilities, the cost of electric service will rise, but it needs to: this is the only way to ensure safe and reliable service. It'll be important for the Texas PUC to consider that these regulatory changes can be – but don't necessarily need to be – implemented all at once. They can certainly be phased in. I do not have the economics worked out entirely just yet, but it is my belief based on what I've researched so far that the difference in cost per kilowatt hour consumed will be fairly small and affordable. The alternative, doing nothing, should not be acceptable. It leaves Texans exposed to unlivable conditions, and becomes instead an incentive for companies to leave Texas.

My name is Ryan Anderson. I may not have a lot of experience dragging brush or handling a chainsaw, but I really feel that through the program AERI assembled to give the students in our program a strong background in UVM this education, we have received an incredibly well-rounded background and understanding of the UVM industry. By the time this program wraps up at the end of the semester, we'll have learned ground-level practical information from leading representatives of every corner of this industry.

Turning to the research I conducted with respect to the Compendium, I studied 14 jurisdictions, including all the southeastern US states all the way up to Maryland and Pennsylvania. Cherí already covered legal research we conducted relating to how PUCs are formed in each state, NESC 218 adoption and the Urban Wildlife Interface Code, so I won't go over my findings in my jurisdictions on those topics - suffice to say that my findings are consistent with hers. Now the southeast corner of the United States is not particularly known for the windy, hot and dry climate that results in so many fires out west, but that's not to say that we don't also have our own share of wildfires. We do. In fact the 2007 Bugaboo fire, which was caused by sparking from a downed powerline, was the largest fire in the history of Georgia and Florida. It burned largely out of control for approximately three months and burned around 560,000 acres, or roughly 2,300 square kilometers, making it at the time one of the largest fires in American history. Given the tremendous impact of wildfires on this industry, two of the legal questions we covered were whether the Uniform Fire Code was enacted, and whether the Wildland Urban Interface and Community Wildfire Protection Plan was enacted. The jurisdictional research I conducted revealed that only one state that I studied, Mississippi, had not enacted the Uniform Fire Code. As for the Wildland Urban Interface and Community Wildfire Protection Plan, of the jurisdictions I studied, only Florida had enacted it. That said, though, both Alabama and Kentucky have Firewise programs that encourage communities and homeowners to develop community wildfire protection plans. In terms of other utility-related vegetation laws, regulations and rules throughout the Southeastern United States up to and including Pennsylvania, what I found was that the majority of states had legislation in place that more or less mirrored my home state of Alabama. Generally speaking, what these states have in common are PUCs that do not see vegetation management as anything other than a maintenance issue for the utilities that they regulate. UVM-related issues are matters that are passed on to them by utilities whenever there is a significant event, but otherwise is viewed as a maintenance failure and little more. The major concerns with vegetation throughout this region relate to impacts from major storm events such as hurricanes and tornadoes, and otherwise jurisdiction regarding trees is left to either local tree ordinances or a state forestry agency. The state forestry agencies, though, are not charged with anything specific concerning trees and potential impacts with powerlines. While several of these states have mandatory vegetation management cycle requirements, many did not, and none had mandatory clearance requirements, none had climbable tree rules, and none had right tree/right place rules. The only state within this region that I studied that had a markedly different position on UVM was Florida. Florida, of course, is exposed to hurricane damage like no other state, and also had a horrific experience with the 2007

Bugaboo Fire. This, together with tornado damage in northern Florida has led Florida to take a regulatory stance that is different from the rest of the states in the Southeast region of the United States. Florida's PUC has directed all investor-owned utilities operating in the state (and there are several: Florida Power & Light, Gulf Power Company, Duke Energy Florida, Tampa Electric Company, and Florida Public Utilities Company) to engage in storm hardening and to file Storm Hardening Plans every three years. These Storm Hardening Plans require utilities to outline their efforts relating to storm preparedness, including vegetation management for all distribution circuits. The Florida PUC identified vegetation management as one of ten storm preparedness initiatives that utilities are required to implement. The Florida PUC requires all utilities to file an annual report on the status of their ongoing vegetation management programs, and the progress made by each Florida utility with respect to its vegetation management program directly contributed to its evaluation by the PUC staff as part of its Reliability Report up until very recently. Additionally, a little over a year ago, the State of Florida passed the Storm Protection Plan Cost Recovery Statute, which requires utilities to file a Storm Protection Plan that covers a 10- year span and requires updates every three years. In furtherance of this, Florida's PUC developed Florida Rule 25-6.030 to address plan requirements, which include reporting on vegetation management activities. Accordingly, now, vegetation management program progress feeds into Reliability Reports by Florida's PUC of utilities only as a component of overall storm hardening. In terms of reviewing plans filed by utilities in Florida, the Florida PUC involves each of the following to consider vegetation management activities by utilities: The Division of Engineering, the Division of Accounting and Finance, the Division of Economics, the Office of Industry Development and Market Analysis, and the Office of General Counsel. Also of interest, the State of Florida has been proactive in giving utilities some of the freedom they need to trim or remove threatening vegetation. Florida Statute 163.045, which applies specifically to regulated utilities, provides that local governments are prohibited from requiring notices, applications, approvals, permits or fees for the pruning trimming or removal of trees on residential property. The purpose behind this statute was to ensure that utilities that identified problem trees could take action swiftly and without local government interference. One thing that I think is also valuable about this particular statute is that it makes the current version of ANSI Z133 mandatory for all utility tree trimming activity. I think that this mandatory safety provision in the Florida statute is exemplary and should be applauded because it helps to keep tree workers safe while performing utility vegetation management work. In this regard, Virginia has also taken some important steps. Virginia's Administrative Code likewise adopts ANSI Z133, and Virginia took this one step further and passed the Overhead High Voltage Line Safety Act which prohibits anyone, including their tools, from working within 10 feet of any energized overhead high voltage line. Virginia – not California - is the state that seems to be taking the lead with regard to this and other statutory measures to protect workers involved in vegetation management in proximity to powerlines. And that brings me to my paper.

As Larry mentioned, through the AERI-Tulane Law School UVM Law Research Project, I've been presented with a unique opportunity to

be part of the task force that is reviewing and revising ANSI Z133 in preparation for adoption and issuance next year. I feel incredibly privileged to be on this task force and to be interacting with some of the top minds in vegetation management safety in the world. While even before I became involved in this project I knew that tree work was dangerous, I never appreciated the full extent of the danger until I saw Larry's presentation to us on electrical hazards and the related ANSI and OSHA standards, which was then reinforced and amplified by what Professor Ball explained. Tree work is, by far, the most dangerous industry in the United States. For several years running now, there are more deaths and serious injuries in tree work than in any other industry. Moreover, utility electric work also places in the top ten most dangerous industries in America. Utility line clearance, then, is quite clearly the most dangerous job in an already dangerous industry. The number of fatalities and serious injuries in this industry is shocking. I've become passionate about all of the good people out there quietly putting their lives on the line just to make sure that I – and all the rest of us - can enjoy the benefit of uninterrupted electric power. I want to make sure that they can do their jobs safely and something needs to be done to improve safety standards in this industry. Larry showed me what part of the problem was, and sadly, it's found in the very regulations that were enacted to protect workers in this industry. OSHA, for those of you who are not familiar, is the US Federal Government's Occupational Safety and Health Administration, and OSHA is charged with issuing and enforcing regulations to make industry safe. The regulation that governs this industry is found at Chapter 29 of the Code of Federal Regulations, Section 1910.269, and it states that arborists and tree workers operating closer than 10 feet from utilities lines must be gualified, and defines a gualified line clearance arborist, or "QLCA" as "one who through training and on the job experience is familiar with the equipment and hazards of line clearance, and has demonstrated the ability to perform the special techniques involved." This is a standard that I'm sure all of you are familiar with. While it's better than nothing, I'm telling you that you don't need a lot of legal training to see the deficiencies. Let me highlight them to you. First, the regulation says that the QLCA must have training and on the job experience. Fine, but what training? What experience? Who gets to decide how much training and on the job experience is needed? Next the regulation requires the QLCA to be "familiar" with the equipment needed for line clearance work. What pieces of equipment in particular, though? And who's to judge what level of "familiarity" the worker has? And, while sure, some of the "hazards of line clearance" are obvious electrocution and burns, for example, which depend on factors such as the power being conducted through the line, elevation, and proximity, other hazards of line clearance are less clear and certainly not set out in 1910.269. For example, workers in this area are subject to falls from significant elevation, being struck by objects, animals, poisonous plants and a whole host of other dangers.

The QLCA standard set out by OSHA really doesn't say anything about any of this. The last phrase of the standard, addressing demonstration of the ability to perform the special techniques involved in line clearance, is even worse in terms of its vagueness. Demonstrate? To whom? To what level of proficiency? Which techniques are being tested? What are the elements of a successful test? How does anyone judge whether a QLCA worker has passed the test or not? What we have here, ladies and gentlemen, is a standard that is left up to individual companies to define and enforce. By working with Larry, I've become very familiar with AERI's safety standards and how they test personnel to be qualified to perform line clearance work. By enforcing extremely rigorous standards and by setting up their own testing and training yard, AERI has been able to keep its people safe. They have not had any OSHA reportable injuries at all. Through Professor Ball, I have learned that there are several other large tree companies that act nationally and internationally that also have rigorous standards for the protection of their workers. But what I want to point out here is that these rigorous standards that companies like AERI and the others have enacted throughout their companies are entirely voluntary. These are standards enacted by caring companies that are serious about health and safety and want to protect their workers. These companies expend large sums of money providing safety training to workers and by making sure that only the best and most highly qualified workers are deemed authorized to work in proximity to the powerlines. But nothing really compels this. A tree company very well could speak to a brand new worker, ask if the worker knows how to use a chainsaw, knows to stay away from powerlines because of the danger of electrocution, and then say, "fine, here's a saw, go cut - you're a QLCA." Technically, the tree company who spends less than 5 minutes on safety in this manner is not violating any OSHA provision. But it certainly isn't doing anything worthwhile to protect that worker, either. What we have is truly a company-by-company standard for safety in this industry. And that, ladies and gentlemen, is no standard at all. And for the worker, in terms of his or her profession, the situation is even worse. Not only can't the worker depend on the company to protect safety on the line, but there is absolutely no job security in being a QLCA at all. The company - not the government – not an institution – is the one that issues the QLCA certification, and so it is the company that decides whether the worker can keep that certification or not. QLCA certification often, guite rightly, comes with a bump up in pay. But if a company doesn't have enough QLCA work to be performed, the company can simply pull the worker's QLCA card and demote the worker in terms of status and pay with no consequence to the company. And if the worker is unhappy, the worker can leave to go to another company, but then that new company is free to evaluate whether the worker does or does not meet their own standards for QLCA work, and that could mean a lengthy and unpaid training regimen with no guarantee of QLCA card issuance and still no protection from having the QLCA card withdrawn later on for any reason - or for no reason at all.

Sadly, the vagaries of the regulatory situation actually discourage regulators from getting involved. Like any enforcement agency, OSHA's budget depends in part on collecting fines and penalties. But in the line clearance tree industry, given the lack of clear regulatory standards, a tree company would essentially have to have no record keeping at all and no safety program at all before it could be held in violation. Based on the regulatory regime as it stands, OSHA is in no position to go to the tree company that just hands a worker a saw and says "go cut" and hand out fines and penalties. Accordingly, OSHA inspectors focus their time and effort on other industries with better defined standards where they can hand out fines and penalties. And what does this mean? It means that OSHA inspectors wind up getting

very little exposure to the tree industry and if they should show up on a job site, they likely have too little expertise to determine whether the job is being performed safely or not. A few states, like California and Virginia, have state-level OSHA organizations that have imposed some stricter and better-defined standards, but most of these standards apply to paperwork obligations and not actual jobsite safe procedures and practices as you find in other industries. As a result, those states can get a little more involved in the tree industry to protect workers. but again, few of these inspectors know enough about tree work to determine if it is being performed safely or not. This regulatory scheme also discourages any professional efforts to improve worker safety in this industry. There is simply no "teachable standard" and so no college or technical school is in position to offer any kind of certificated program that would entitle tree workers to any kind of proof that they can carry from one company to another that proves that they have the skills and knowledge to competently perform this work in a safe manner. There is an effort now in California's County College system to provide basic tree work training and the University of Wisconsin at Stevens Point also has a new program started to provide training. The ISA, UAA and TCIA all have voluntary programs too, but no worker with any of these credentials is in any position to demand anything from any tree company as a result of having such credentials. Workers would be right to question whether time, effort and money spent on earning such credentials is really of any assistance at all to them in this profession, and the colleges and technical schools are unable to offer students in these programs any confidence at all, let alone a guarantee, that any of these credentials will mean anything to them in their careers. The position I'm taking in my paper is that this situation is morally reprehensible. People are getting injured and killed because of the lack of any meaningful regulation coming from OSHA to protect this industry, which OSHA admits is the most dangerous in the nation. I don't want my paper to be a platform that just points out this problem. Instead, I want to take a page from Martin Luther King Jr.'s playbook and also offer a workable solution. I am currently collaborating with experts in this area to come up a proposal for new regulatory language to be adopted that will stop this injustice in its tracks. A new regulation with a meaningful standard that can be taught by institutions will provide assurances that workers in this industry will receive the attention and protection they need from regulators, will hold tree companies accountable for providing better training, tools and practices, and will allow teaching institutions to provide meaningful certification programs that do help workers advance their careers. All this will reduce the number and severity of injuries in this industry. And that will ultimately lower insurance premiums and make this work less costly to perform. I, Larry, think that one of the things you can see is that we are developing legal expertise to handle this changing world. Cherí and Ryan are just two of the law students in the AERI-Tulane Law School Intern UVM Law Research Project. Both of them came to this profession with fresh eyes and fresh perspectives and have engaged in ground-breaking research across the North American continent that will provide a meaningful research tool for this industry through the UVM Law Compendium, and they are engaged in drafting innovative - and quite unique - research papers aimed at recommending changes in this industry that are meant to benefit not only this industry, but society as a whole.

AERI (Asoneo Environmental Restoration Industry) is a vegetation management company based in Sacramento, California. AERI is a relatively new company, but its leadership has decades of unparalleled international experience in the UVM and related electric and telecommunications infrastructure protection industry. This expertise includes direct experience in every aspect of vegetation management, contracting, FEMA level emergency response, fire mitigation and critical infrastructure protection. In addition to direct experience doing the work, AERI leadership has been involved with development of many of the current industry BMPs and regulations that actually compel the work. This includes, for example, ANSI BMPs, regulatory requirements such as NERC FAC-003 and California GO 95 Rule 35. AERI's successful early work achieved top marks in both safety and production, resulting in a rapid promotion to prime contractor status for a major utility and expansion into related vegetation management work throughout California.

Larry Kahn is an attorney with over 25 years of practice as well as an entrepreneur. Lawrence was named Chief Compliance Officer of AERI in September 2018 and has served as Secretary and Director of the company since its inception, where he was charged with creating a safety program for the removal of hazard trees from powerlines in California for a major investor owned utility. Mr. Kahn drafted the company's safety manual, developed the company's training modules, and trained the tree industry professionals in AERI's safety culture and principles. AERI became the first company to pass PG&E's safety assessment on the first attempt and has become the model for safe and professional tree work for utilities in California. He helped transition AERI to new areas as well, including pre-inspection, QA/QC and work verification, herbicide application and wood management activities. He now heads up AERI's program in conjunction with Tulane Law School, the UVM Law Research Project, which is developing a compendium of laws, regulations and rules in the UVM industry and is developing a cadre of legal talent to handle the legal expertise demands of the vegetation management industry.

Cheri Hasz is a recent graduate from the Tulane Law School. Cheri is from Houston, Texas and graduated from Cornell University in New York. She went to Tulane Law School after having already worked in the energy industry, with an interest in focusing her expertise in energy law and its interconnectedness with the environment. Cheri is a member of the Utility Arborist Association, and researched the laws, rules and regulations of most of the energy producing US states, and, based on her Spanish language ability, has also undertaken the research of Mexican law as well. In addition to the work Cheri has been doing for AERI, she is also the Editor in Chief of the Tulane Journal of International and Comparative Law, and has a leadership role in the Tulane Latinx Law Student Association.

Rvan Anderson is a third year law student at Tulane Law School, Rvan is from Birmingham. Alabama and is a graduate of the University of Alabama. Prior to law school, Ryan had experience working for a major utility, Southern Company, and she chose to attend Tulane Law School because of her interest in energy and the environment. She now serves as the President of the Tulane Environmental and Energy Law Society, and in that role over she organized and ran a 2-day conference devoted to environmental and social justice, which attracted nearly 500 participants who attended 15 separate legal programs taught by top national experts. The conference was entirely student-run and student-organized and Ryan pulled the laboring oar through all of it with aplomb. Ryan is also an editor of the Tulane Environmental Law Journal and in addition to the paper that she's writing for AERI as part of her internship, she's also authoring a separate paper for the Environmental Law Journal. Ryan has also earned a highly coveted place with Tulane's Environmental Law Clinic, where she will handle real cases in court on behalf of indigent clients. Last summer, Ryan worked as an intern with a large law firm that handles much of Southern Company's work and so she became familiar with utility legal matters in that way. This summer, Ryan will be working for the Southern Environmental Law Center, where she will see the other side of the coin, if you will, and will work to correct environmental injustices. In addition to all that, through her work with AERI, Ryan has become a member of the Utility Arborist Association and was invited to join the ANSI Z133 task force dedicated to updating and improving safety standards in the tree industry, and through her work with that committee, those standards are on track to be updated in a new publication to be issued next year.







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JESSE IMBEAULT: INDUSTRY SERVICE PROFILE

- VAL EICHELT, PVMA

WHILE INTERVIEWING JESSE IMBEAULT FOR THIS ARTICLE IT WAS APPARENT THAT HE LOVES HIS JOB AND HAS A BIG PASSION FOR THIS INDUSTRY.

Jesse has vegetation management in his blood. His father worked for Davey Tree (formerly High Tree), retiring after 32 years. His brother has spent 28 years with Davey Tree and one of his sister's and brother in-law have also worked for them on and off.

Needless to say, Jesse had a good idea of what the work involved when, at 18 years of age, he made the decision to pursue a job in the Vegetation Management Industry. After working in some seasonal jobs, the lure of full year employment resulted in Jesse's decision to go to work for Davey Tree.

He began in the heavy equipment end which morphed to Arborist with him attaining his UTW certificate. He has worked in logging operations, oilfield explorations, road construction, utility, and fire areas. In 2014 he took an Industry related advancement course at the Davey Institute of Tree Science in Ohio. He has spent 19 years with Davey Tree, with the last 3 years in the position of Regional Manager of all utilities in Alberta.

A big plus to the job that Jesse sees, is that no 2 days are alike. He enjoys the changes of scenery from Alberta to BC to Saskatchewan and the Yukon. Fortunately for him he had a very understanding girlfriend (now wife) who didn't resent the long periods when he was away working. He also gets to see places other don't see by the utility right of ways, like hidden lakes and corridors. He has found many great spots that he has been able to go back to and camp in.

Jesse wanted to be a voice for the mechanical end, so he joined the PVMA Board of Directors 3 years ago. He is currently the Director in Charge of the Safety Committee and has been working alongside that committee chair on several initiatives.

He would like to see Utility Arborist become a recognized trade because they are definitely more than "unskilled labourers"



Another thing he loves about his career choice is solving challenges. He is always looking for ways to keep the work safe and efficient. Jesse loves the outdoors and was looking for that style of work when he was choosing a career path, and this work checked that box.

The PVMA is always appreciative of those who give of their time and expertise to serve our organization and its membership. If you are looking to get involved at either the committee or board level, reach out to any of the current board members or the PVMA office.





DRONE SPRAYING

- CORY SOUTHAM OPERATIONS MANAGER, STRONGFIELD ENVIRONMENTAL SOLUTIONS INC.



Back in March, some of you may have attended a presentation I gave on drone spraying at PVMA's Spring Virtual Conference. The event was very well put together and several engaging questions were asked which lead to an invitation for this follow-up article on the state of drone spraying regulations in Canada and where things are headed in the near future.

Drone spraying is a reasonably new idea and method of pesticide application here in Canada, but around the world drone spraying has been going on(most notably in Asia) since the 1990s. In Japan, for example, Yamaha's RMAX aircraft has been reported of treating upwards of 2.4 million acres each year. Numbers like this make us wonder - why does drone spraying seem like such a new concept and still so far away from seeing adoption in Canada?

Our drone journey began when we picked up our first camera drone to document some of our work in 2018. As a provider of land reclamation and vegetation management services, our team at Strongfield Environmental Solutions naturally wondered if there was a drone large enough to mount a spray system. After a some internet research, we found our answer - YES! Our excitement was short-lived, however, once we found a page dedicated to drone spraying on Health Canada's website. Health Canada's stance on drone spraying hinges on the premise that aerial application labels on pesticides were only ever intended to apply to manned fixed-wing or rotary aircraft, not unmanned aircraft or drones. As such, any and all pesticide applications made via drone are considered off-label and illegal anywhere in Canada. Currently, the only legally allowed applications are beneficial products like fertilizers, micronutrients and granular applications like seeding and fertilizing.

The potential benefits of this new form of pesticide application almost seem endless the further we look into the topic. A study done in



Malaysia back in 2017 concluded that operator exposure from drone applications range from anywhere between 45 and 230 times greater than a backpack spray application. By removing the need for an employee to wear the application equipment, and inevitably walking through the treated area at times, the only exposure comes during mixing and loading as you can simply setup the ground crew location upwind from the treatment area with any drift travelling away from the operator. Further, a study from 2019 at Texas A&M University showed that we are able to get improved efficacy out of a drone while using a quarter of the water volume compared to a standard ground treatment. The biggest factor driving this increased efficacy is the rotorwash turbulence created by the drone disturbing the target canopy and getting greater canopy penetration on the target plants. In seeing the overwhelming potential benefits to our operations, our team decided to spearhead the regulation changes needed to get drone spraying approved in Canada. We made some great contacts in the United States - where there is currently a pathway for operators to apply pesticides with a drone under an aerial application label - and not long after we were invited down to the aerial application research centre of the USDA in College Station, Texas. It was here that we were able to first see drone spraying in action as they were conducting pattern testing and spray quality assessments on a variety of drone spraying platforms. The week we spent down there gave us a new sense of excitement and optimism for what we could be able to do here in Canada. Within a few months, we had our first batch of spraying drones delivered and we began flying them to test what we could do with water since water trials are allowed in Canada. In October of 2019, we held our first field day in Lacombe, AB where we conducted live spraying demonstrations of our 5, 10 and 20L platforms in conjunction with an in-depth presentation by USDA's Dan Martin. The event had such a positive reception that we were shortly after able to form the Remotely Piloted Aerial Application Systems(RPAAS) Working Group. The purpose of the working group is to tackle research needs

Health Canada has around operator exposure, drift, efficacy and crop residues related to drone spraying.

As we and the world dealt with the COVID-19 pandemic, not a lot of progress was made on research and development in 2020; however, with things slowly getting back to normal and with travel opening up in 2021, we were able to help out with research studies for numerous chemical companies. Throughout the summer as we traveled across Western Canada gathering data on efficacy and crop residues, the preliminary reactions and results show an extremely promising future for many drone applications. These results are opening the door for many more studies looking at more aggressive water volumes and utilizing different spray droplet sizes to increase productivity. The outcome of one of our studies looks so positive that the chemical company is hoping to have generated enough data to move forward with a label amendment for that product. Although it feels like baby steps at times, we are satisfied and excited with the successes of the 2021 season and are grateful and proud to be at the forefront of the progression of drone spraying regulations in Canada.

Some of you may be extremely excited to hear that the work is being done and we may finally be seeing drone spraying or RPAAS labels in Canada within the next year or two while some of you might still be wondering "why should I be excited about this?". Let me increase your excitement by sharing some data we have been able to gather.

Not long after receiving our platforms we decided to generate some real world numbers on how drastically we could increase our operational efficiency with drones compared to our conventional spray equipment where we use UTVs and trucks. We took setup, mixing, loading, flight and battery swap times into account and when we ran the numbers we were shocked. Last year we had an 80 kilometre stretch of right-of-way in Central Alberta where we had to spray the stripped topsoil pile for weeds. With a team of 5 people, 2 UTVs, 2 trucks and 2 trailers it took us 13 days to complete due to difficulty in accessing through wet areas and enhanced clubroot cleaning protocols. With the drone, we calculated a crew of 2 people, 1 truck and a spray drone could complete that same right of way that took us 13 days UTV spraying in just 2-3 days with the drone. By using lower water volumes we are able to cover upward of 20ac/hr, decrease our environmental footprint and exponentially reduce our washing and decontamination efforts around clubroot as the application equipment never actually has to touch the ground of the area being treated. In addition to these benefits, since the drone runs on GPS and can fly automated routes we are able to all but eliminate the variability that inevitably comes with multiple employees trading off the duty of hand spraying the back side of the soil pile where we just don't have access to drive a UTV.

Drones aren't going to be a fit for every project, but once we see product labels getting approved we expect they will transform our entire equipment fleet in many ways - reducing equipment costs, reducing labour needs, allowing client budgets to go further, expediting equipment cleaning and decontamination efforts, and decreasing the environmental footprint our operations leave behind. With all of these benefits, we feel most of you will be with us when we say we are very excited about what drone spraying will be bringing to the vegetation management industry in the next couple of years.



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COMMITTEE REPORTS

- CASINO COMMITTEE

Our next Casino has been scheduled for March 2 & 3 of 2022. We will be looking for a lot of volunteers to work the casino.

This is the update we received from ALGC:

As you are likely aware, on September 15, the Government of Alberta announced updated COVID-19 restrictions which require most businesses, including casinos, to implement new government safety restrictions or to implement a program requiring patrons to provide proof of vaccination or a negative COVID test within the last 72 hours (Restrictions Exemption Program - REP).

Currently scheduled casino events will go ahead as planned. Each casino facility has the option to adopt the new restrictions or implement their proof of vaccination program (REP). At this time, casinos are in the process of implementing their chosen programs. *Because each casino facility may choose which option they prefer to implement, questions about the new rules and restrictions at casino facilities should be directed to your casino facility.*

Questions about whether or not your volunteers will need proof of vaccination should be made to the casino facility directly as it depends on each casino facility's chosen program. If you have further questions about the new regulations at your casino event, please contact your advisor. Charities will be permitted to work casino events with reduced volunteers if required.

Laura Hammer, Director in Charge

- MEMBERSHIP COMMITTEE

Membership remains strong and we continue to have a few new companies/ individuals join us each year.

Membership benefits include, but are not limited to:

- Access to cash bursaries for dependants of PVMA members.
- Discounts on UTT/UTW Certifications and Re-Certifications
- Discounts on registrations for Spring Seminars and Workshops, where CEC's and CEU's are available.
- You/Your Company can be listed on our Featured Members Directory on our website.

Laura Hammer, Director in Charge

- UTT/UTW BOARD OF GOVERNORS

First off, I would like to speak to the UTT/UTW program that was completed the end of August this year after Covid had led to the cancellation of the program the year before.

- I would like to thank all the students that attended, as schedules had to be changed a number of times due to restrictions in place and their ability to adapt was key for us having a successful delivery of the program.
- I would like to thank all the employers who enrolled students in the program this year for their patience while we adapted the course in order to deliver it.
- I would like to thank the instructors who worked with us and changed their schedules on the fly to accommodate the delivery.
- I would also like to thank the staff at Old's College. The team there
 adapted the delivery of the classroom portion to an online instructor led
 training model.
- Finally, I would like to thank the Board of Governors for their support while we were putting everything together.

I know I have used the word thank you a number of times in this update but the one thing I have learned very quickly in my first few months as a director is that it takes a strong team in order to roll this program out. It is with that strong team and the understanding and willingness of the employers and students involved to adapt to the changes we had to make that made this year successful.

I also wanted to acknowledge that we had four women come through the course in the first intake this year that represented the companies well that had sent them with a strong skill set and a willingness to learn. This marked a milestone being the first time we had that large of number entering the industry and gives me hope as our industry continues to grow that more women will take on the challenge.

Bob Gordon, Director in Charge

-SAFETY COMMITTEE

The safety committee will be running a safety awareness campaign focusing on some of the information shared with us from the instructors at the last UTT/UTW program.

- There was some great interaction between the students and their instructors and we will use this information to develop safety awareness bulletins that will come out in the PVMA magazine.
- The committee will focus on ways to increase safety awareness within the industry covering the mechanical and herbicide sides of our industry.
- Any ideas you have for topics you would like to see covered please send a note to the PVMA office and the safety committee will look at developing an awareness bulletin to go in the magazine.
- As always if you are interested in joining the committee, just reach out to the PVMA office and we will follow up with you.

- INDUSTRIAL/NATIONAL COMMITTEE

Many of the other associations are moving forward with Fall Meetings both in person or virtual. IVMA of B.C has their biennial event - 'The EVERYTHING in Vegetation Management Forum Nov 2-4, 2021 at Sun Peaks Grande Conference Centre in Kamloops, BC. This event can be attended in-person, or virtual. Check out their website at https://www.ivma.com/ivma-bc-events for details on how to attend.

IVMA- ManSask has approached the PVMA to assist them with getting their bookkeeping in order. PVMA also hosted their Spring Virtual Workshop through our PVMA platform on April 30th, 2021. The organization will be looking to the sound structure of the PVMA moving forward to assist their organization. http://ivmamansask.com/ The Ontario Vegetation Management Association OVMA is current and has been running virtual workshops throughout the past 18 months. A field tour was hosted on September 28th in Grey County based out Collingwood ON. with 40+ participants in attendance. Information on the OVMA can be found at https://www.ovma.ca/ The Atlantic Vegetation Management Association (AVMA) will be hosting their In Person AGM November 23-25th in Moncton, NB. at the Delta Hotel. Check out their website for information on how to attend at http://myavma.ca/blog/ The Canadian Pesticide Education Program is still working on finalizing the launch of their National Industrial Vegetation Manual. This will provide a National standard to Industrial Vegetation Licensing across Canada. This manual should be available in 2022.

Geoff Thompson, Director in Charge

- EDITORIAL COMMITTEE

We have a great assortment of articles this issue on new technology in Vegetation Management. Some articles are follow-ups from presentations at recent PVMA workshops and seminars. Please take the time to read through them all, we are sure you will find them both informative and educational. We would like to thank those that advertise in our magazine. Your continued support of this important Industry publication is appreciated.

Val Eichelt, Committee Co-Chair

- SEMINAR COMMITTEE

We are excited to be hosting the Virtual Fall Workshop the same date as the release of this publication. We have had great reviews from the previous online events and look forward to using the InEvent platform once again. The theme is New Technology in the Vegetation Management Industry and we will hear presentations on the new advances in application technology, herbicide chemistry, and a look at the 'roots' of communication amongst trees. The PVMA is pleased to once again be able to host this event FREE of charge through the use of Casino funds. *continued...*

Looking forward, we will be also planning our Spring Conference & AGM on March 8-10, 2022. Our plan is to offer it as a hybrid event where we will be meeting both in person (at the River Cree Resort) with an online option for those who are unable to attend in person.

The in person option will depend on the whether there are any provincial health restrictions in place at that time. We will be monitoring them closely and will keep membership informed. To stay on top of what is happening, make sure to sign up for the PVMA newsletter, if you haven't already done so. Contact val@pvma.ca to be added to the list.

Lisa Rybchuk, Director in Charge

- GOV'T LIAISON COMMITTEE

Alberta Environment and Parks internal audit is now complete. A number of areas of improvement were identified and actions are being taken to address the findings of the audit.

The Pesticide advisory committee (PAC) is scheduled to renew meetings in January 2022. In 2021, no PAC meetings were scheduled due to reduced time and capacity. This is an opportunity for the PVMA to again become involved in this working group. To this end I would call on interested members to join the liaison committee to provide input into their area/s of expertise. Covid continues to cause administrative delays with AB Gov Agencies. Devon is working diligently on requests as they come in, patience and understanding is key during these times.

The National Industrial Vegetation Manual is nearing completion. Comments from industry have been received and a contract writer has been hired to address some of the concerns raised (i.e. more information on spray nozzles, etc.). Publication is projected for early 2022 and will be available to applicators at this time.

The PVMA is committed to increasing communications and enhancing our relationship with our partners in government and education. If you have interest in becoming involved in the liaison committee, please reach out. Vaughn Leuschen, Director in Charge

Vaughn Leuschen, Director in Charge

- MARKETING COMMITTEE

The committee will work together over the next couple months to present a marketing plan for 2022 to the Board of Directors at the December meeting. We are looking at expanding social media platforms with a focus on driving people to our website. Also getting input on a website update or different options. We will have a few different ideas and budgets to present for approval to move forward with in 2022.

THE VEGETATION MANAGER magazine

- ADVERTISING RATE SHEET

2022 RATE SHEET

*submit ads or inquiries to Val@pvma.ca

AD SIZE SPECS:	SINGLE ISSUE RATE (MEMBER)	ANNUAL RATE (MEMBER) * THREE Issues - 2 printed, 1 electronic (printable)
FULL PAGE ADVERTISEMENT	\$800	\$1680
HALF-PAGE ADVERTISEMENT	\$550	\$1155
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BUSINESS CARD ADVERTISEMENT	\$100	\$210

Full Page Ad: 8.375"(w) x 10.875"(h)

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1/4 : 4.125"(w) x 5.375"(h)

Business Card: 3.5" (w) x 2" (h)

- PUBLICATION SCHEDULE

Deadline for submission January 28, 2022 May 4, 2022

Sept 14, 2022

NOTE:

Keep live matter 1/4" from trim on each side. For ad spread units, please supply 1/16" duplicated image on both sides of the centerline.

<u>Distribution Date</u> March 8, 2022 (Print) June 2, 2022 (Electronic) October 20, 2022 (Print)

UTILITY-FOCUSED TECHNOLOGY FOR VEGETATION MANAGEMENT

- KIMBERLY LAING AND ORVILLE MCLEAN (ARBORMETRICS).





Utilities have their work cut out for them. The utility sector has become a very charged business environment due to the confluence of environmental changes, weather-related events, destructive wildfires, regulatory compliance, new generations entering the workforce and the corresponding knowledge gaps, and consumer demand for higher levels of engagement and service. Due to this, public perception of the utility reputation is more fragile than ever. Utilities are consistently driven to optimize Operations and Maintenance costs to maintain or improve safety, system reliability and consumer costs.

To help with this, utilities are taking a holistic approach to their Vegetation Management Program (VMP) and getting creative. This includes system wide evaluations of their programs for resource optimization, examining infrastructure, internal and field operations and implementing software. Now more than ever there is a need to invest in innovative and emerging technology to offset long-term, foreseen operational costs.

Technology can play a vital role in conjunction with a well-managed and experienced team. A simplistic approach to technology could be; how can it support the operations and; how can it help maximize our investments? These are fair and foundational questions based upon Labour (people) and resources (money). There are technology solutions we all use as we problem solve each day. These solutions can start as a work-around or a bridge and become a legacy system as we evolve to new working situations. Technology supports us as we transition throuchout a lifecvcle. There are multiple technological tools in the marketplace today that can meet a utility's needs. The 'best' tool is really the one that can effectively answer the Labour and resources questions for that specific situation. Labour and resources can manifest in a variety of ways; the operating environment, functional requirements of the existing system, safety and reliability goals, and appetite for innovation. These resources assist utilities with meeting operational and regulatory requirements that involve transparency, modeling, and reporting. There is also a push for reducing inefficiencies by capturing/storing data electronically, leaving behind outdated paper systems, and utilizing Vegetation Management Program software that integrates between multiple business units, effectively responding to customer requests quickly. Going from a linear and reactive model to a more conditions/volumetric proactive model increases safety, reliability, provides accurate results and decreases costs.

Utilities want technology that will efficiently collect, process, and visualize data, and act as a system of record for vegetation which integrates easily into other software systems. Today's VMP software technologies promise analytics to increase efficiencies and have capabilities for forecasting and modeling, scheduling, and managing work, reporting, planning and prioritizing maintenance, as well as optimization for decision making and future planning.

A VMP that utilizes several types of technology could look like this:



Perform Field Work & Continue

Figure 1 Example of the role of technology in different phases of a vegetation management program

In surveying utilities in the industry, we know that everyone wants to do more with their data, specifically to capture more information and expand their program to include additional value-add capabilities.



Figure 2 - There are various methods for which a company would want to apply a technological solution.

Ultimately, whether the data that is used is captured from above the ROW or in the field, there is a move towards reduction of field collection with improved analytics. With an increase in automation and improvements in satellite technology, utilities are increasingly investing in newer and alternative methods of collection.

The next section looks at the role of technology in different stages of a Vegetation Management Program, but not necessarily in order.

DATA COLLECTION

The following table outlines some methods of visual data collection but does not include other types of data that are important such as weather data and thermal data.

DATA	COLLECTION METHOD	BENEFITS	SHORTCOMINGS
LiDAR:	Unmanned aerial systems (UAS/drones); fixed wing aircraft; helicopters; ground-based collection	 Extremely accurate data capture Inspect assets such as poles and substations determine causes of outages with purpose built analytics maintain and validate GIS records. New route selection environmental and topography features Excellent for detailed engineering studies High point density can provide the opportunity to obtain ground elevations even with dense vegetation canopies Allows for detection of changes in the landscape 	 Traditionally expensive, however the space has become more competitive which is driving the cost down. Due to cost and person-power, less frequent data capture; a lot can change over 4 or 5 years Visualization can be enhanced but must be integrated with other types of desktop applications Requires extensive data processing

Satellite	Self-contained communication system in orbit	 More frequent data collection as compared to LiDAR Improved accuracy and technological enhancements coming from various market leaders Economical alternative to traditional LiDAR Ability to collect to collect stereo imagery and map the topography from a photogrammetric approach Lends itself well to detecting changes in landscape Various data sources available 	 Optical imagery cannot penetrate vegetation or first level surface features. Higher resolution image sources will require higher costs for collection. Less optimal spectral, spatial, and temporal resolution compared to LiDAR
PhoDAR	Fixed wing aircraft; helicopters; ground-based collection; unmanned aircraft/drones (less common due to weight)	 Economical alternative but less common than Lidar Effective for collecting large data assets Quick deployment 	 Requires strict control procedures and flight altitude and ground speed must be monitored Difficult in wind Uncertain with tree canopies and ground profiles limited in accuracy and foliage penetrations. It is also fully dependent of the digital elevation model and ground control
Common optical instruments (cameras)	Ground-based crews; Unmanned aerial systems (drones); ground-based vehicles (trucks, ATVs, UTVs, Snowmobiles), Augmented Reality/ Virtual Reality tools; laser range finders; stabilized binoculars	 Accurate visual from the ground Easy to use system of record Technology easily accessible, good for user adoption and field workers Can help with engaging the public quickly. Quick solution for site-specific records & work verification 	 Potential for human error Needs to be integrated with a GIS- type solution Not for detailed studies and analysis Cannot travel easily to remove areas or access out-of-line of sight Expensive for large T&D networks

PROCESS AND VISUALIZE DATA

Once data is collected there are numerous options of organizing it into actionable insights for your operation. It is important to first organize and sort the data, which is the pre-processing and processing stage and an extremely important step.

Next, decide how to visualize the data. There are numerous software solutions available with customizable dashboards and visualization of your network in 2D, 3D, Augmented Reality, and other environments.

Before field inspections and maintenance are performed, you can bring your T&D assets right to your desk. This type of visualization can enable a proactive approach by providing a way to look at the system at a high level, while prioritizing work based on highest risk areas. Some of the main reasons for visualizing the network or spans, is to identify network risks, geographic patterns, prioritize assessments and coordinate work. Once risk has been validated, assessed, and prioritized, trim and mitigation efforts can be planned and placed into a single or multi-year program relative to your own resource availability, budget, regulatory environment, and risk tolerance.

Depending on the type of data being collected, there are options for future analytics by comparing data sets, such as enhanced change detection and tree growth modelling, to name a few.

Figure 3 - An example of data visualization in ROAMES Software by Fugro



PLAN AND EXECUTE WORK

Once the desktop assessment is complete and the work priorities are setup, key data points can be transferred seamlessly into a field software GIS solution and field assessments can begin. The data captured from aerial imagery will equip field workers with additional insights for their day-to-day decisions. Finding a field tool that can read existing data is key.

If aerial data collection and desk top studies are out of scope, then you would start at this step with technology implementation.

Practical field tools will allow field workers to perform enhanced planning and execution capabilities which provides proactive assessment, routing efficiencies, clearance data, prioritization for inspections and overall health of the network they are working in. This enables workers to:

- Take care of the most at-risk areas first.
- Work safer by only going into out of line-of-sight areas when needed.
- Work efficiently by validating the data with human eyes and visual context.

Perhaps the best use of data capture is having a system of record where all the information about a work site is captured in one place. The result is a higher quality operation with better and faster decision points. Standardized data allows planners to work more eliciently and with greater accuracy that saves time on the job because crews go into the field armed with everything they need to succeed: the right equipment, information about the task and work site, as well as detailed maps.



Figure 4 Sample Field Data on a GIS platform in ArborLine by ArborMetrics

PERFORM FIELD WORK

Now that the work is planned and ready for execution, workers can begin to perform their work. Whether it is with mobiles phones, tablets, hands-free tools, or any other devices, the key is to have field workers, tree crews, foresters, supervisors, and any related departments, to be working on a unified platform to capture, store, and manage the workflows.

Often people are working through a multi-step and complex stages so anything that can be moved electronically and streamlined the better. Examples could include, work locations, site hazards, capturing electronic permission forms for landowners, directory of calling numbers, and progress tracking to name a few.

It allows you to have information at your fingertips so you can manage risks daily, focus on the 'need to know' and have real-time work reporting.

ANALYTICS REPORTING

Having a macro view of your entire vegetation management operation allows for increased engagement, clear-eyed leadership and additional productivity and transparency. Not only does this help you manage compliance and reporting, but it also allows you to expand your vegetation management program to help with resource optimization, fleet and equipment, staff training and risk forecasting. The daily reporting and metrics do not stop there. From the field tools, data can be integrated with numerous other systems, as well as feedback into other visualization platforms to continue refining the VMP into the future. Examples of useful predictive analytics that can be applied to vegetation management include predictive tree growth models, vegetation health, fall-in risk, susceptibility to infestation, and much more.

Conclusion

No matter the steps you decide to take to help improve your Vegetation Management Program and navigate through these transitional times, technology, if applied correctly, can certainly help reduce costs, save time, and help plan the future.

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