

## NEW TOOLS:

# Restoration Technologies



**New restoration technologies could be a win-win for managers and operators.**

Being the first on board with a new technology can be risky, but it can also bring huge benefits. Imagine if you were one of the first people to invest in Apple - you would be taking a big risk investing in a young company that was doing things in a completely different way, but today you would certainly thank yourself for having been an early believer!

New restoration technologies represent exactly this kind of opportunity. In particular, new amphibious excavators and tow-behind implements have been described by many as “[game-changing](#)” technologies.

Amphibious excavators are one tool gaining significant traction. With the help of a modified undercarriage and tracks, these ultra-low pressure machines **exert less pressure than a human foot** on the ground. They can even make small water crossings with minimal impact. [In a recent trial](#) this Trax 200 crossed a creek without even stirring up any sediment!



What makes these impressive feats so game-changing? By being able to operate on non-frozen ground during the spring and summer months, these machines **eliminate a whole host of problems that come along with winter operations.**

These challenges will probably sound very familiar to operators. For example, frost depth can be difficult to predict: in some cases, machines have actually fallen through the frost and sunk into the muskeg below. Shorter winter daylight hours also make for tough and fatiguing days, short (6-10 week) employment periods make work unreliable for contractors, and there is increased wear and tear on machines when they are constantly operating in cold temperatures.

Not only do amphibious excavators mean that **these operational problems can be better managed**, but they also bring added benefits that create a win-win for both operators and managers. By expanding restoration activities into the summer and fall months, the time window for restoration operations can be increased by up to five-fold (6-10 weeks in the winter versus 28-32 weeks in the summer/fall<sup>i</sup>). In addition, the time required for creation of a mound or a scalp is much lower when the equipment does not have to work through frost, and operators can make higher quality microsites when the soil is not frozen.

But as with every tool, not every aspect of amphibious excavators and summer restoration work is perfect. Accessing remote areas can require significant travel time and amphibious excavators are currently quite slow at commuting. Getting operators to and from equipment

can also pose a challenge in summer conditions, where the luxury of driving trucks to the equipment is not available. There are continual opportunities for improvement. Nevertheless, amphibious excavators represent a promising new technology that could significantly increase restoration opportunities, efficiency, and quality.

And amphibious excavators are just one of many new tools that may soon enter the restoration toolbox. For example, this Shark Fin Drum was recently tested and was able to create sites for plants to re-establish at over three times the rate of conventional scalping.



***A Shark Fin Drum tow-behind implement. Each of the “lumps” of soil being created may serve as a valuable site for vegetation to establish in the future.***

Clearly, many efficiencies are soon to be gained in restoration practice. You may be asking yourself, “why are we not using these tools and machines already? What’s the hold-up?” There are a few key limitations that COSIA and partners must work to address before the technology can see broader application.

- **More training:** there is a need to focus on training more skilled operators to apply these technologies, because operators make up half of the equation. Technology is great, but without the skilled personnel to work these machines and apply the restoration treatments, gains in efficiencies will not be realized.
- **More trials:** there is a need for larger scale trials and more follow-up monitoring to assure companies that results are reliable, and that buying new equipment is worth the investment.

- **More rapid technology research and development:** new equipment ideas are frequently not perfect in the first prototype. Therefore, there is a need for a more rapid cycle time between innovation, testing, continual improvement, and deployment.

To bring these new technologies into regular practice, there is a need for more trials, more training and more buy-in. Specifically, advancing new technologies and improving restoration efficiency requires a few brave entrepreneurs and companies to be willing to be early believers, and to invest in these new technologies.

## Key takeaways:

- Using new technologies to operate during non-frozen ground conditions represents a **win-win for managers and operators:** restoration programs can become more efficient and less costly for companies, while also creating safer working conditions and more reliable employment for operators.
- More testing of new equipment and training of operators is needed to help these technologies break through into mainstream use.

*[We have included a potential “call-to-action” for the bottom of the post; we suggest that the specifics of this should be developed in discussion with NRCan and COSIA.]*

Want to join the restoration revolution? Consider asking your company to fund a trial or a joint industry project to test amphibious excavators at a larger scale.

<sup>1</sup> Pyper, M., & Larsen, D. (2016). *Evaluation of Amphibious Restoration Equipment on Muskeg Sites*. Edmonton, AB: Cenovus Energy.