

WHO NEEDS AIRFIELDS? —

# One man designed and built the ultimate bush plane

It all started when the engine in Mike Patey's Wilga 2000 failed.

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Bush airplanes are the SUVs of general aviation—small, piston-engined aircraft designed or adapted to carry a passenger or two, or to ferry light cargo in and out of remote areas with crude or non-existent runways. They're in use everywhere from the Alaskan Tundra to the Australian Outback to the African bush.

Traditionally the tool of professional bush pilots, bush planes have recently become highly enjoyable toys for a cadre of enthusiasts. Fascinated by the low, slow off-airport, back-country flying which their STOL (short takeoff and landing) qualities make possible, private pilots have sought out bush planes for recreation.

Vintage high-wing airplanes like the iconic Piper Super Cub (debuted in 1949), Cessna 180 (1952), or Maule M-7 (1984) join modern STOL airplanes like the Kitfox S7 Stl or Cub Crafters' Carbon Cub around camp fires atop mountain plateaus or at STOL competitions where pilots vie for honors with the shortest takeoff and landing distances and lowest stall speeds.

There's endless debate among pilots about which plane is best for this task or that adventure. But at the huge 2018 EAA AirVenture annual airshow at Oshkosh, Wisconsin, a couple of weeks ago, Utah entrepreneur Mike Patey showed up with what many are now calling "the ultimate bush plane."

## Wilga Wary

Last year, Mike Patey was flying his Wilga 2000 low over Utah Lake for a photo shoot with a group of other bush planes. Suddenly, its piston engine blew, throwing two connecting rods. With no altitude for gliding, he had to land fast. In its death throes, the engine made a final burst of power, allowing Patey to just make it to a cornfield. Safely down, he decided he would rebuild the Wilga around an idea he'd been mulling for months.

The airplane Patey set down in the field was based on the PZL-104 Wilga, a relatively large four-seat Polish bush plane designed in the 1960s for STOL aviation uses. Powered by a 260hp Russian-designed radial engine, the high-wing monoplane was sold from 1963 to 1996, followed by the improved Wilga 2000 (powered by a six-cylinder, 300 hp Lycoming O-540).

Patey had been dissatisfied with the Wilga's Lycoming for some time. Like any piston engine, its power diminishes as altitude increases. At the elevations in his local Utah back country, Mike's Wilga 2000 lost 45 to 70 horsepower, significantly extending its takeoff distance. "The engine was anemic for the sheer size of that aircraft. At higher elevations, instead of doubling its [takeoff] roll to 800 feet, it gets up to 2,000 feet when I'm up on an 8,000 foot mountain top."

High altitudes degraded the performance of the Wilga's relatively small cantilever wing as well. Standing by his airplane in the corn rows, Patey said aloud, "I'm going to fix this thing, get it out of here, and then it needs a turbine."

## DRACO

The turbine Mike had in mind was a 680 shaft-hp Pratt & Whitney PT6A-28, a powerplant found in dozens of modern turboprop aircraft. At twice the power and about half the weight of the Lycoming, the PT6 would literally make the Wilga jump and perform even better at high altitudes.

The engine swap was complemented by adding a 102-inch, four-blade MT propeller to harness the PT6's power. That was only the beginning of a long list of modifications, from redesigned longer, wider wings (plus-12 inches span, plus-11 inches chord), elevators, and rudder to bigger wing fuel tanks and special landing gear-leg tanks. Patey upgraded the brakes and added 35-inch main gear tires. He opted for a new digital cockpit with autopilot, infrared night vision, and a backup camera, totally new wiring, heating and electrical systems, and HID landing lights from a 737 airliner.

The changes were so extensive that the FAA had to approve the conversion as an experimental exhibition aircraft. No longer considered a Wilga 2000, Mike has dubbed it "DRACO," a Latin-derived word meaning dragon or serpent.

Whatever you call it, the result is astounding. For comparison, take the popular

Carbon Cub STOL airplane. A small two-seater weighing 1,023 pounds (464kg) empty, it can take off at sea level in just 110 feet, land in 140 feet, and stall at 36mph (58km/h). DRACO is twice its size—a 2,500 pound (1,360kg) four-seater that can take off in 97 feet, land in 110 feet, and stall at about 36mph.

Before its conversion, the Wilga took off in 400 feet, landed in 280 feet, and stalled at 57mph (92km/h). Like most bush planes, it wasn't optimized for high-altitude flying. But DRACO can fly high. In fact, Patey designed and installed a four-passenger oxygen system that allows him to take advantage of PT6's performance at altitude. DRACO will climb at 4,000 feet-per-minute (FPM) and cruise at 180mph (290km/h) at 16,000 feet. A Carbon Cub climbs at 2,000 FPM and cruises at about 115mph (185km/h) around 5,000 feet.

DRACO achieves performance and flexibility unheard of in other similarly designed bush planes. To really understand what went into it, watching Patey's [series of build videos on YouTube](#) is worthwhile—and not just for the technical detail.

## The Joy of the Job

For even the most sophisticated DIY-ers, the project Patey undertook should have taken years.

He completed it in *five months. By himself.*

But for Mike—a serial entrepreneur who founded and ran a deck/gazebo-building company with 200 employees by the age of 18 and later built a successful rapid-prototyping firm (Prodigy Engineering)—the opportunity to work is a joy. "Our parents taught us that if you started a project, no matter how much you disliked it, you finished it. It was the excitement of finishing a job. We grew up that way, and, despite being poor, we were unbelievably happy," he said.

Ironically, DRACO has made the tens of thousands who have seen it fly online and in-person at Oshkosh happy. Patey says people are most delighted by how squat the bush plane looks on its articulated suspension when he throttles up for takeoff. DRACO looks like a big Praying Mantis. A few have questioned whether DRACO—which cost around \$1 million to build not counting Patey's time and which runs on jet fuel rather than more common 100 octane gasoline—can even really be considered a bush plane?

Patey points out that he can find jet fuel at most airports in the US and that, in other parts of the world, it is far easier to find than aviation gasoline. DRACO's PT6 will also run on diesel and other fuel mixes, which potentially makes it *more* of a bush plane. He acknowledges that it's expensive, but it's what he dreamed of. "I have a plane that can go to 28,000 feet and do 180mph cross-country with four people and gear. Yet I can take it where a Carbon Cub can go," he told Ars. "To me, that makes it the ultimate bush plane."

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