I did manage to run some speed vs power tests on my sailboat. My first goal was to calibrate my paddlewheel so it reads closer to real speed. Earlier I posted graphs of numerous readings from Snow Lily over the past few seasons with the caution that I suspected my paddlewheel was reading high.

So here is some basic info for Snow Lily:

Tartan 34C (from spec sheets)
length 34-5
LWL 25-0
displacement 11,200

5kW continuous rated Electroprop system with 2.5:1 gearbox
12.5 x 14 3-blade prop
Sevcon Gen IV controller
Full throttle is 2000 RPM set per the software

batteries: (20) CALB 180AH nominal capacity cells in series

I recorded battery DC volts and amps delivered to the motor. Power is simply V x A watts

Raymarine i40 display with speed and depth transducer
GPS readings are from an iPad app

Measured course is from careful scaling on a chart between two markers.
As best as I could scale, the distance run is 822 yards or 0.406 nautical miles

Conditions during the test runs were very light breeze, waves less than 1 foot, but some wake from other boats every once in awhile. Currents are unknown, but probably very minor. The light breeze favored the NW direction run. I set the throttle and then did not touch it during the run; starting the timing after a pre-run to stabilize boat speed before crossing the start point. Test at each throttle setting was done once in each direction.

The i40 display speed varied a little- about 0.1 to 0.2 knots. The GPS speed was jumping all over the place and I recorded the most commonly seen number.

<u>Test 1- Full throttle</u>
NW pass
72 A 63.3 V 1968 rpm
time 4 m- 15.6 sec
speed (distance divided by time) 5.7 kts
i40 speed 6.9 kts
GPS speed not recorded

SE pass
71 A 63.3 V 1992 rpm
time 4 m- 27.0 sec
speed (distance divided by time) 5.6 kts
i40 speed 6.9 kts
GPS speed not recorded

Test 2- Moderate Speed
NW pass
15 A 65.1 V 1180 rpm
time 6 m- 49.6 sec
speed (distance divided by time) 3.6 kts
i40 speed 4.1 kts
GPS speed 3.6 kts

SE pass
14 A 65.1 V 1182 rpm
time 7 m- 6.5 sec
speed (distance divided by time) 3.4 kts
i40 speed 4.1 kts
GPS speed 3.6 kts

Test 3- Slow Speed
NW pass
3 A 66.0 V 648 rpm
time 13 m- 18.8 sec
speed (distance divided by time) 1.8 kts
i40 speed 1.6 kts
GPS speed 1.9 kts

SE pass
3 A 66.0 V 640 rpm
time 13 m- 25.7 sec
speed (distance divided by time) 1.8 kts
i40 speed 1.9 kts
GPS speed 1.9 kts

SUMMARY RESULTS
Average of the two passes is summarized below.

4.525 kW 5.6 knots actual (6.9 kts indicated on i40, factor 0.81)
0.944 kW 3.5 knots actual (4.1 kts indicated on i40 factor 0.85)
0.198 kW 1.8 knots actual (1.8 kts indicated on i40 factor 1.00)

I intend to calibrate my i40 display at 85% should be reasonably accurate at 3 to 4 knots, a few tenths too high at upper end and a few tenths too low at lower end.

For the charts I posted earlier I have adjusted the speeds, which were i40 display readings, by the calibration factors above and am reposting them.