1.0 **Purpose**
The purpose of this document is to provide the method for testing the functionality of the Growth Innovations Adjustable Pitch Propeller (GIAPP) assembly in a simulated use and field use environment.

2.0 **Scope**
This document applies to the Growth Innovations Adjustable Pitch Propeller assembly.

3.0 **Relevant Documentation**
3.1 Growth Innovations Adjustable Pitch Propeller Final Design Report Fall 2005. (Current Standing Revision)
3.2 Applicable Test Protocol.

4.0 **Equipment**
4.1 Testing trough
4.2 Appropriate motor
4.3 Shift Linkage
4.4 GIAPP assembly
4.5 Timing device
4.6 Appropriate boat
4.7 Pole (for boat movement)
4.8 Paddles (2)
4.9 Life Vests
4.10 Gas

5.0 **Safety Considerations**
5.1 The GIAPP is a high speed assembly. Stand clear of test area during simulated use.
5.2 The motor will get hot during operation. Refrain from touching the motor during operation.

6.0 **Preparation**
6.1 Secure the testing platform and water trough in anticipation of high levels of vibration and generated forces during testing.
6.2 Fill the water trough with water.

7.0 **Procedure (Simulated Use)**
7.1 Fasten the motor to the test stand.
7.2 Fasten the GIAPP and associated shift linkage to the motor shaft.
7.3 Fill the testing trough with water.
7.4 (BY HAND) Manually check for free rotation of the rotating segment of the GIAPP and rotation of the blades via use of the shift linkage.
7.5 Lower the GIAPP and motor shaft into the trough to a suitable height.
7.6 Turn on the motor and allow five (5) minutes for warm up at idle.
7.7 Observe the motor shaft and GIAPP assembly for any irregular movement or vibration during warm up.
7.8 Engage the full forward position by using the shift linkage.
7.9 Increase the throttle position to full throttle for 5 minutes.
7.10 Observe the flow of water in the trough to ensure that the proper directional thrust is generated.
7.11 Return the throttle position to idle for one minute.
7.12 Engage the full reverse position using the shift linkage.
7.13 Repeat steps 7.9 – 7.11
7.14 Repeat steps 7.8 – 7.13 until the total full throttle time is one hour.
7.15 Disassemble the GIAPP and note damage and wear to the internal components (if any).
7.16 Reassemble the GIAPP and note any difficulties on the appropriate note sheets.

8.0 Procedure (Field Use)
8.1 Fasten the GIAPP and shift linkage to the motor shaft of the test motor.
8.2 Allow a one minute warm up for the motor.
8.3 Observe the GIAPP for irregular vibration.
8.4 Run the motor at full speed (forward and reverse) through deep open water sections of the test facility.
8.5 Run the motor at low speed (forward and reverse) through weeded areas to verify the weedless capabilities of the GIAPP.
8.6 Upon returning to the dock, remove the GIAPP from the motor and disassemble it noting any wear or damage to the components.
8.7 Approximate runtime for the field use segment of this test should be a minimum of one hour.

9.0 Acceptance Criteria
9.1 Refer to applicable test protocol.