# An ROV for Marine Species Search and Rescue

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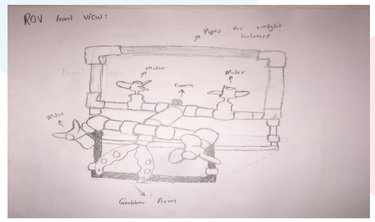
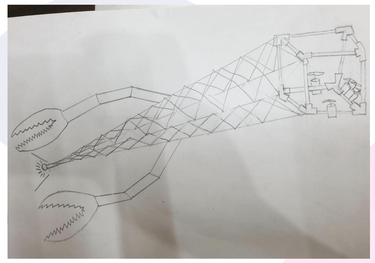
## Research Problem

The fish, mammals, reptiles, plants, animals, and other species that live in the salty waters of the seas or oceans; or the brackish water of coastal estuaries, are known as marine species. Plastic contamination and overfishing both pose direct risks to the health of our oceans; without appropriate safeguards and corporate accountability, we risk irreversible harm and the extinction of several marine species.

## Concept Design

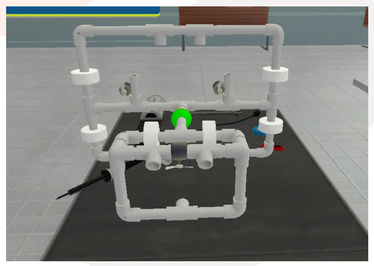
Literature review is conducted on similar rescue machines. Then, the initial design for the proposed ROV is developed. The proposed ROV consists of a rectangular frame with a claw at the front of the ROV. A carrying net is proposed to carry the saved species.

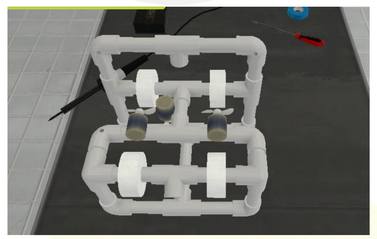




## CAD Designs

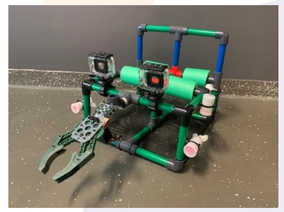
The ROV is digitally designed using the vperch online platform. This website provides the necessary components to convert the sketches into 3D models. The software was helpful to determine measurements and test problems before building the prototype.

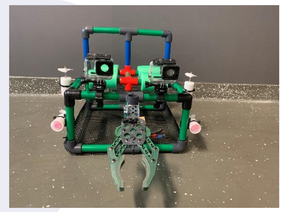


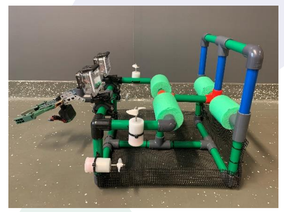


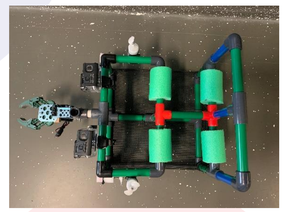
## Final Prototype

The final ROV frame is designed using 24 PVC pipes (5 inches), 9 elbows, 7 tees, 2 3-way corners, and 2 4-way corners. Two motors are used for vertical motion to enable the ROV to carry the marine species. Two cameras are used to provide wide visualization range. A robotic arm is used to help in releasing the marine creature from the nets. Screws and nuts are used to connect the claw to the PVC pipes.









## Project Objectives

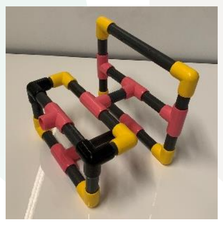
In this project, an efficient marine species rescue ROV is designed and built. The ROV pilot will be able to see trapped underwater species using two wide range cameras. The ROV is equipped with robotic arm and designed to dive and search for trapped species in fishing nets and plastic containers. Then, the ROV can release the species or transport them to the surface for further help.

## The Novelty

- The ROV is made to help in a pressing problem (marine life rescue).
- Stable, rigid, and modular design.
- The ROV pipes are standardized to 5” elements.
- It has a robotic arm for quick help and 2 cameras for wide visualization.
- Large internal space to accommodate marine creatures,

## Design Iterations

Two frame prototypes are built before building the final prototype. The iterations are made to ensure the stability of the ROV and the suitable size for the mission.



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