

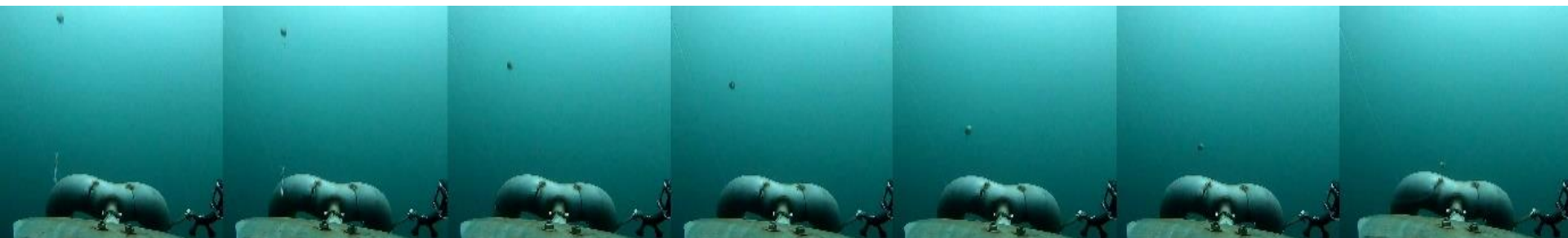
# Development of underwater line setters for manually baited bottom longlines

## Project objectives:

**Develop and improve a towed underwater line setter using wheels to deploy the longline at depth.**

**Develop and improve a towed underwater line setter using a guide to deploy the longline at depth.**

**Assess the performance of both underwater setting devices during a series of sea trials.**

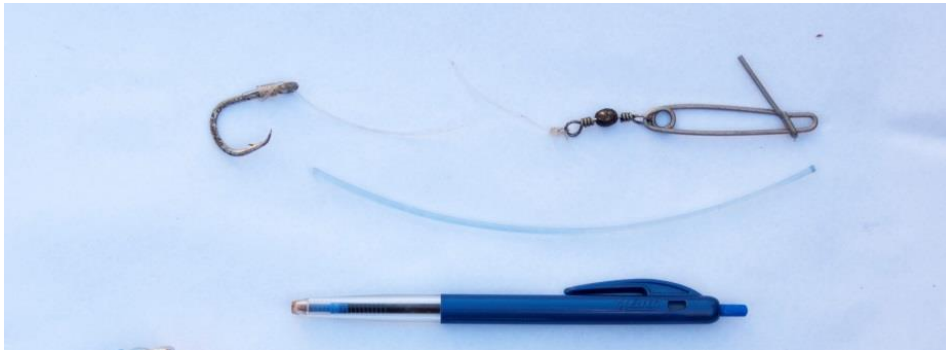


## 2. Manually baited snapper longline gear

Snoods (hooks, clip, and trace) stored on cards

Snoods manually clipped onto a stoppered backbone

Floats and weights clipped on alone and together



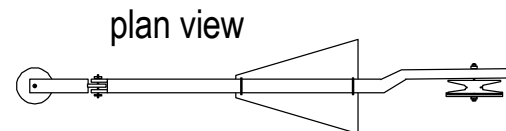
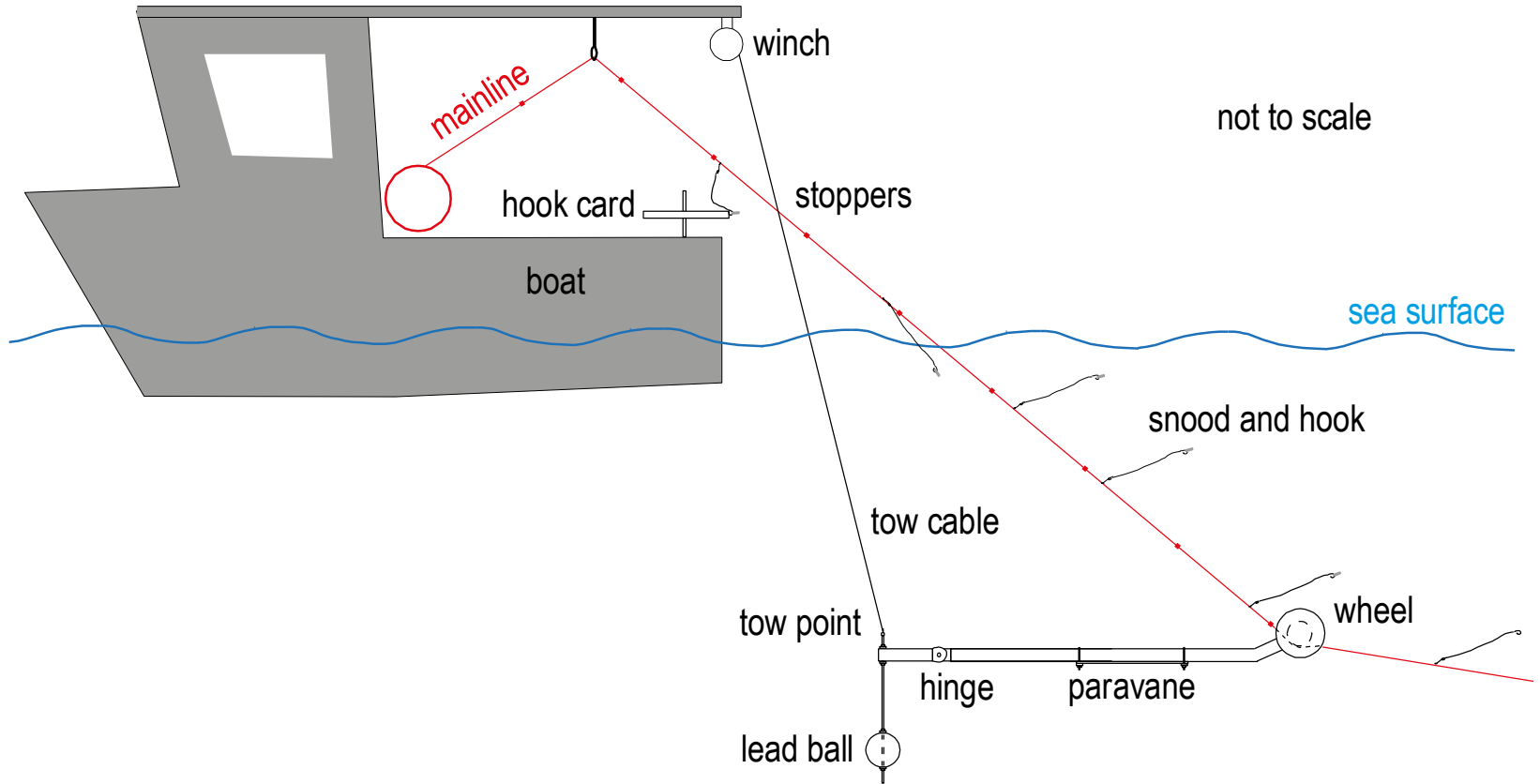


### 3. Manually baited snapper longline gear

1 or 2 sets per day, usually 1 before dawn, occasionally in day  
500 - 7000 hooks per day



# 4. Concept



# 5. Challenges

Deploying the mainline at depth

Tangles

Bait retention

Depth (vs speed)

Consistency

Weights, floats, surface floats

Turns



# 6. Research approach

No literature / how to guides

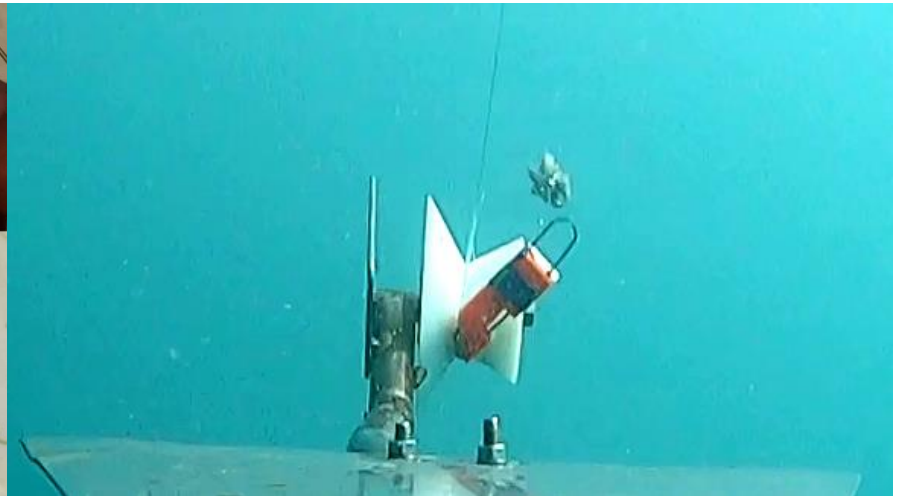
Process of iterative improvement

1. Identify problems that need fixing
2. Make modifications
3. Trial new version, record data (measurements and video)
4. Assess performance (review video, data)

Repeat

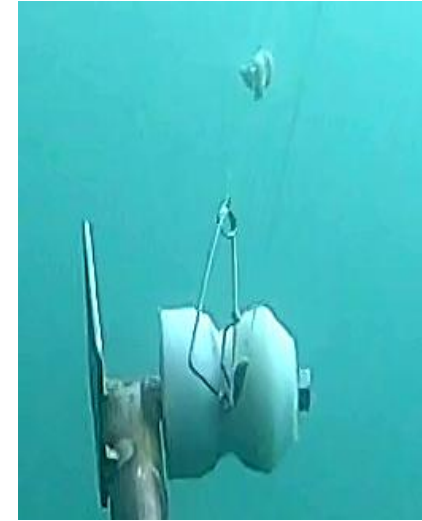
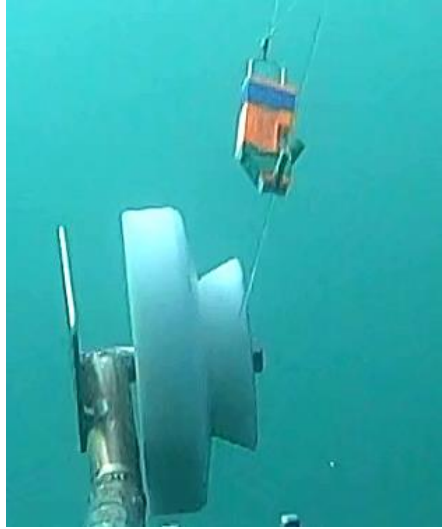
## 7. Setter with a wheel

**Objective:** Use a combination of wheel and clip design to turn snoods and hooks beside the wheel.



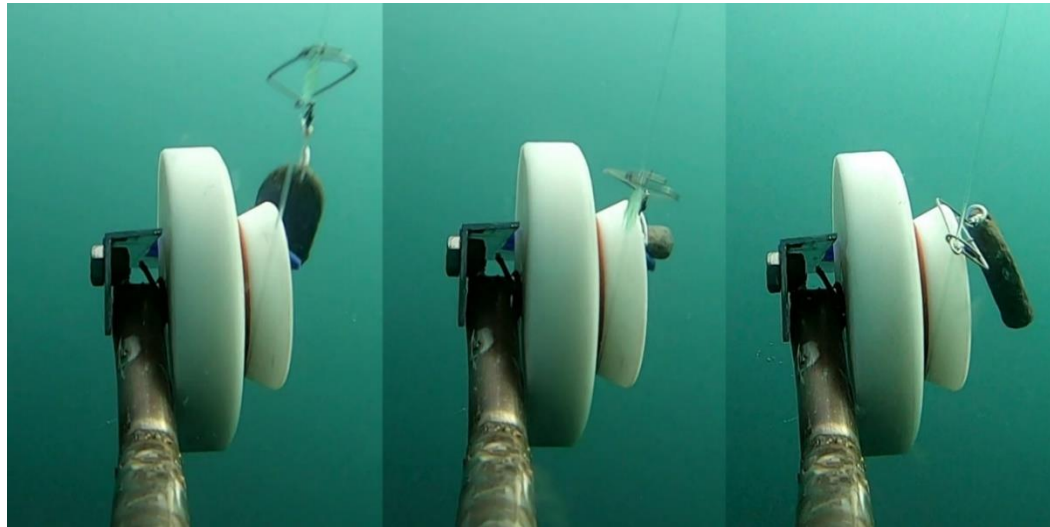
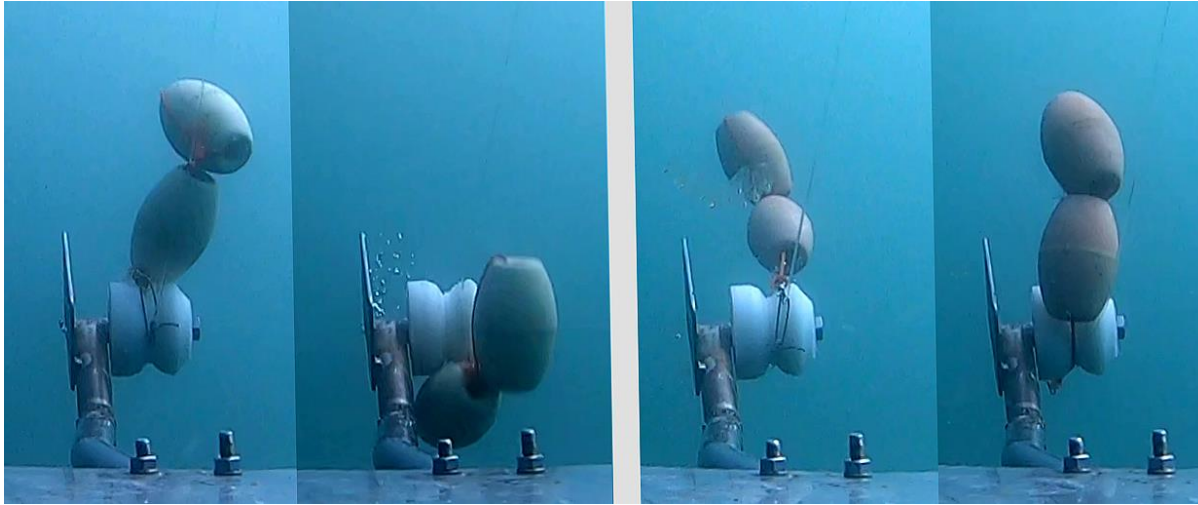


## 8. Different wheel and clip designs





## 9. Deploying floats and weights



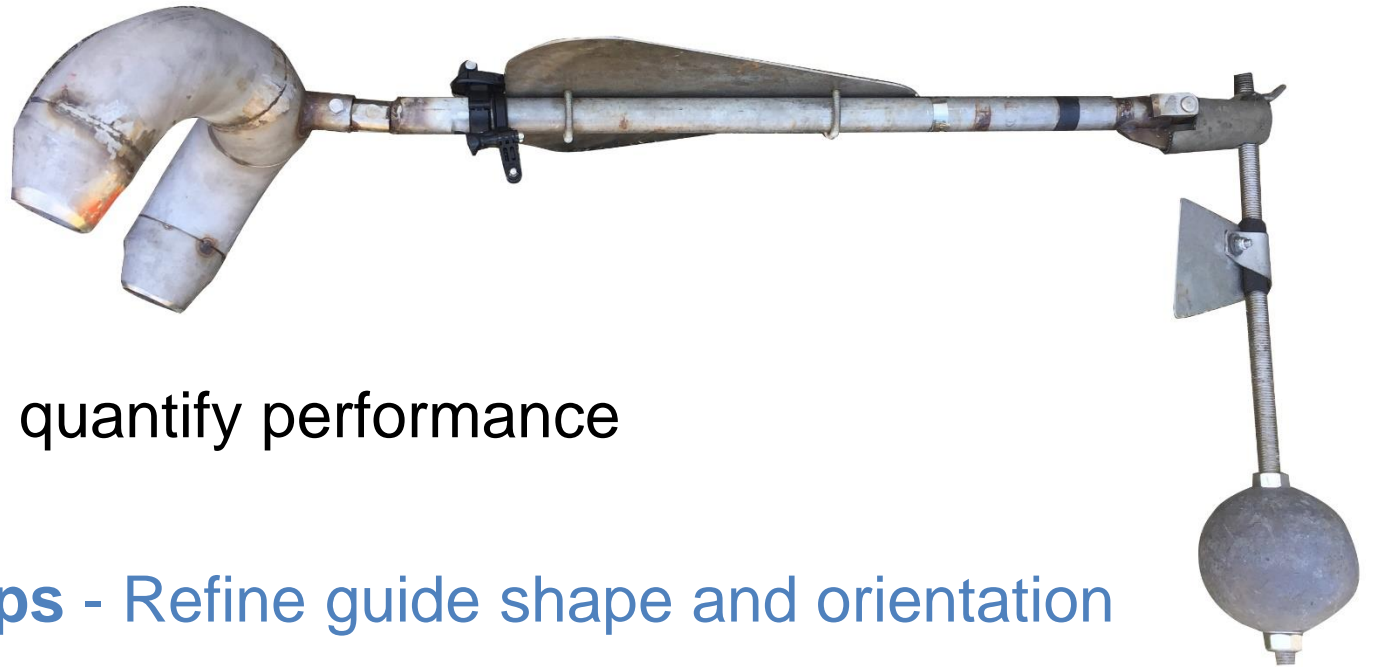
# 10. Results / Conclusions

Concept does work, baits don't touch wheel.

More development needed:

- Consistency
- More clip / wheel refinement
- Eliminating catch points
- Reliably setting floats and weights
- Dealing with snoods tangled around mainline

# 11. Setter with a guide



## Objective

Improve and quantify performance

**Between trips** - Refine guide shape and orientation

**Between deployments** - Refine settings:

weight distribution, paravane, rudder

**Within deployments** - Adjust tow cable length, line tension

**Measure response:** Depth, bait retention, catch

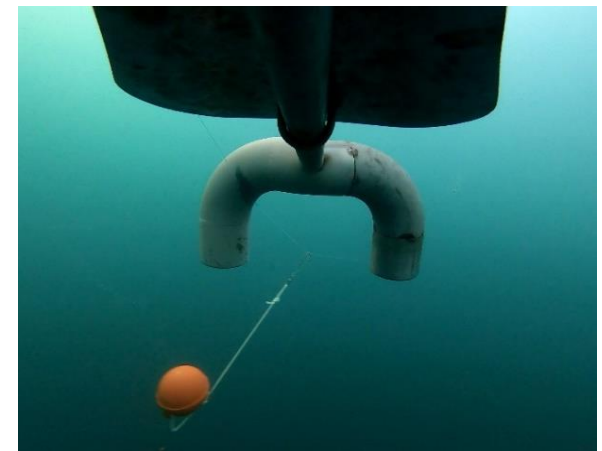
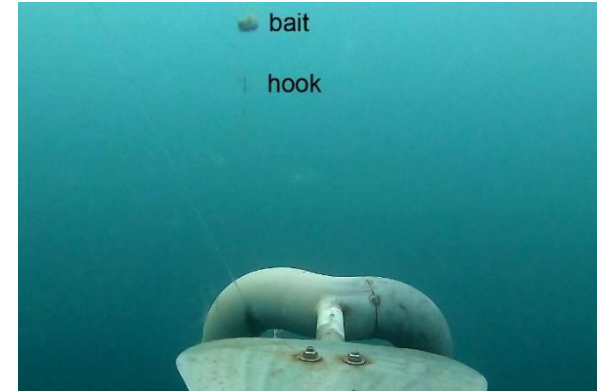
# 12. Results

Successfully deploying weights, float weight combinations, and surface floats.

Successfully deploying squid and sanma baits at depth with minimal damage.

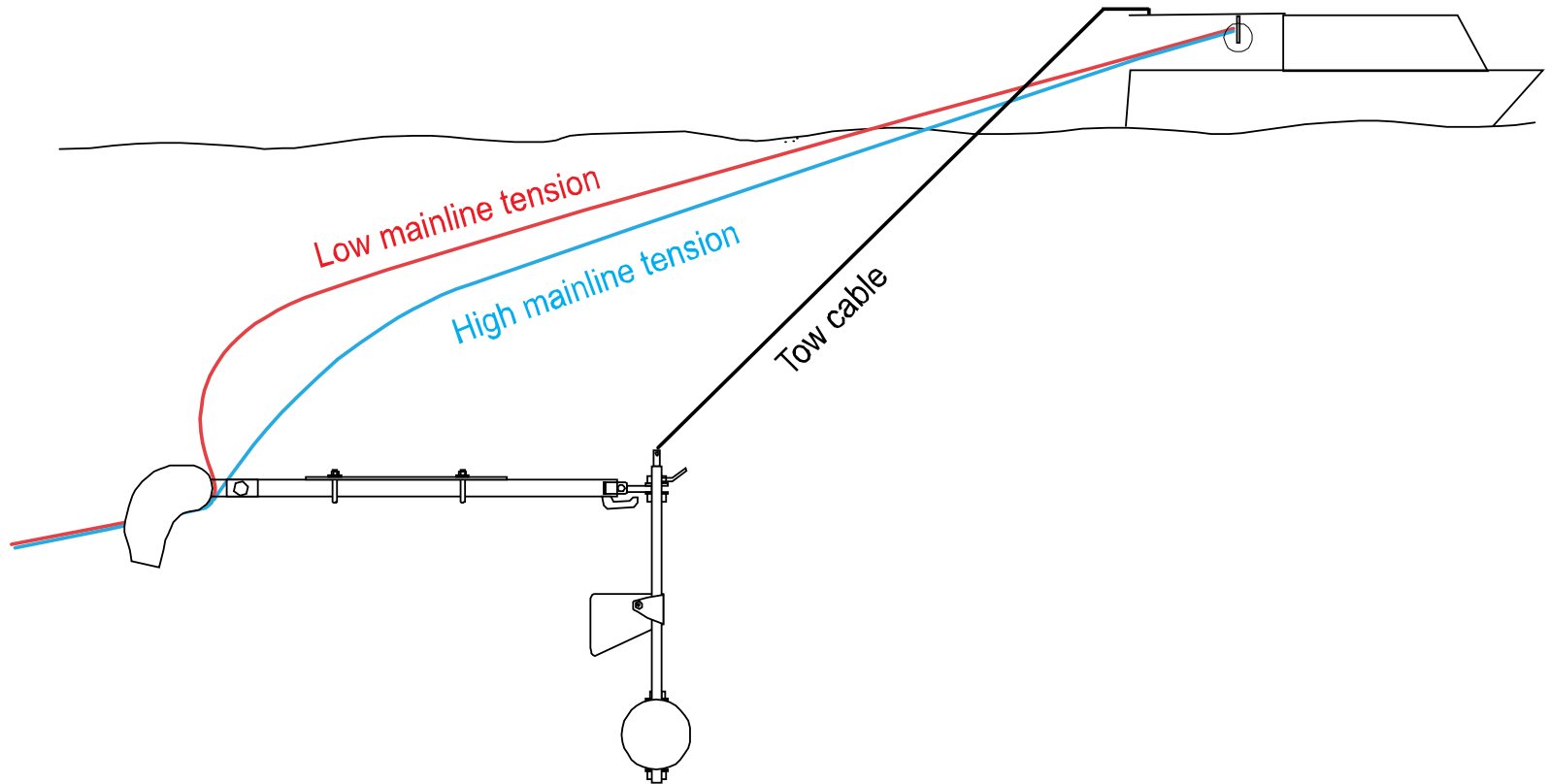
Pilchard bait is fragile – loss rates are unacceptable, even before snood reaches setter. Baits are lost and damaged just by pulling them rapidly through the water.

Mainline tension requires further investigation.





# 13. Mainline tension



Better setter performance (depth, bait loss) at high mainline tension

BUT poor snapper catch rates at high mainline tension

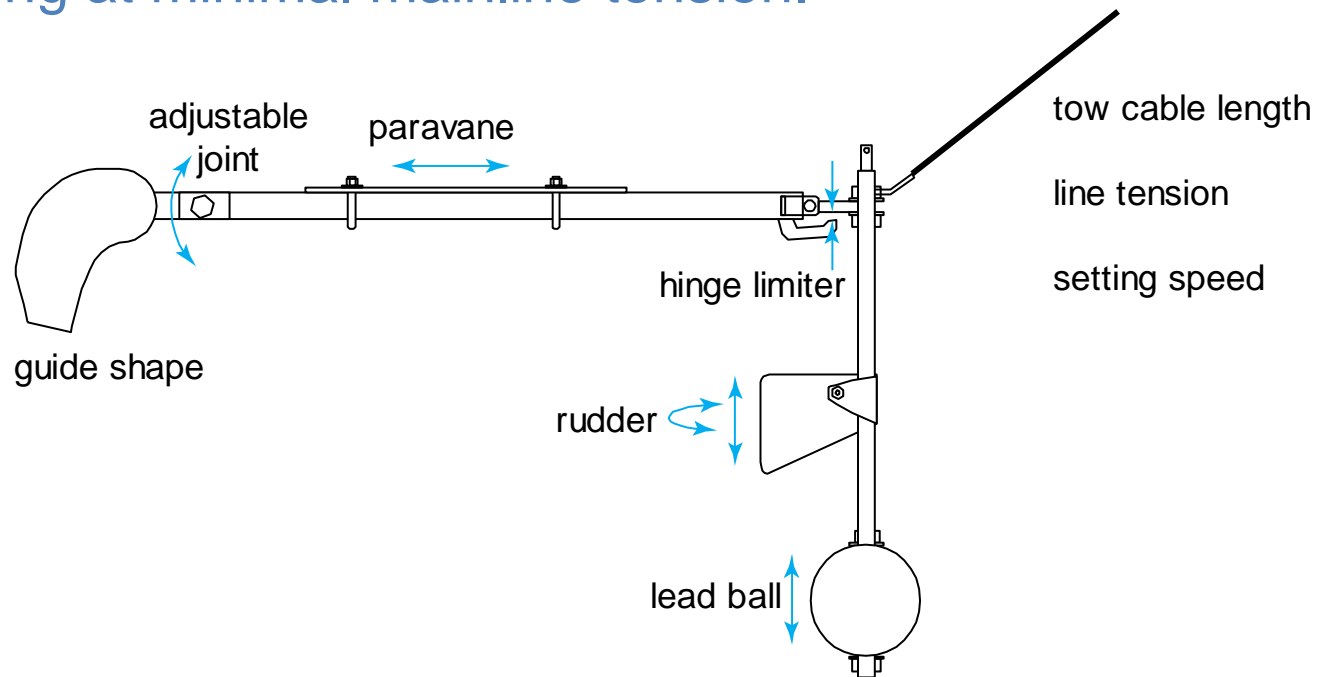
Need to strike the balance

Requires accurate measurement and control of line tension

# 14. Next steps

Develop line tension meter

Find the optimum guide setter configuration to minimise bait loss whilst setting at minimal mainline tension.



Measure catch rates vs control treatment of normal set

# 15. Acknowledgements

Skippers, owners, crew, engineers, CSP team

