



CLEANERFISH USE IN MOWI IRELAND

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MOWI SOUTHWEST

SEA LICE IN SALMON FARMING

- Sea lice species *Lepeoptheirus salmonis* and *Caligus* spp. are found in wild and farmed salmonids in Ireland.
- Sea lice are an external parasite that feed on the mucosal layer leading to scale loss and bacterial infections.
- Sea lice are one of the biggest factors affecting the health of farmed salmon worldwide, cost of treatment in Norway in 2018 was €144.8 million.



Egg-bearing adult female *Lep. Salmonis*



Sea lice attached to head of salmon



Image of all *Lep.* life stages

TIME SCALE

- **2014:** Small scale trials carried out
- **2015:** Wild caught wrasse and hatchery reared lumpfish first deployed
- **2016/2017:** Increased use on all Irish sites
- **2018:** All MHI sites now using Cleanerfish with improving efficacy and health a larger focus
- **2019:** Carrying out trials to improve over all health and develop Operational Welfare Indicators (OWI's) on site
- Positive results on the majority of sites with cleanerfish deployed, resulting in a reduction in the use of chemicals in some areas

LICE TREATMENTS

- Chemicals were previously the most common form of treatment but have some downsides
 - Limited use when maintaining organic standard
 - Lice can build up a resistance
- Mechanical treatments are becoming more popular and widespread e.g. hydro-licer and thermo-licer, these can be extremely costly and resettlement can be high post-treatment
- Cleanerfish are a more sustainable treatment alternative when maintaining an organic standard.
- They operate best when implemented as a preventative measure prior to lice outbreak

CLEANERFISH SPECIES



Ballan



Goldsinny



Cuckoo



Corkwing



Rock Cook



Lumpfish

STOCKING PRACTICES

- Stocking of wild wrasse is aimed at between 6-8% during the summer depending on lice burden.
- Wrasse sourced locally where possible
- Hatchery reared lumpfish are stocked to 5% during the winter.
- Additional wrasse or lumpfish can be stocked if lice levels show an increase or remain the same.



Lumpfish transport truck



Cleanerfish transport tanks



Transferring wrasse into pens

HIDES

- 1m of hide to 30-50 cleanerfish (depending on size)
- Essential for maintaining good condition on all cleanerfish
- Various materials can be used:
 - Curtain (Artificial kelp)
 - Barrel
- Lumpfish can require solid structures to rest on or an area to shelter in stronger tides



FEEDING

- Wrasse and lumpfish both require regular feeding to maintain condition
- Wrasse graze on feeding blocks
 - **Biomar wrasse feeding blocks**
- Lumpfish are hand fed pellets
 - **Skretting Clean Lumpfish**
- Feed should be distributed into the hide directly to avoid salmon coming in contact



Lumpfish feeding



Lumpfish pellets on left



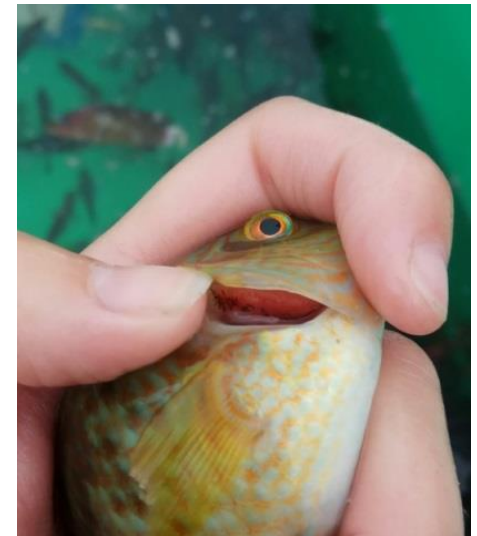
Wrasse feeding block

TREATMENTS AND HEALTH CHECKS

- All cleanerfish species are susceptible to AGD
- Lumpfish can be treated with a 2-3hr FW treatment.
- Wrasse are removed when treating with FW and treated with H₂O₂.
- Methods for removal:
 - Potting
 - Grading/dewaterer
- Health checks are carried out on elevated mortalities



H₂O₂ treatment for AGD on site

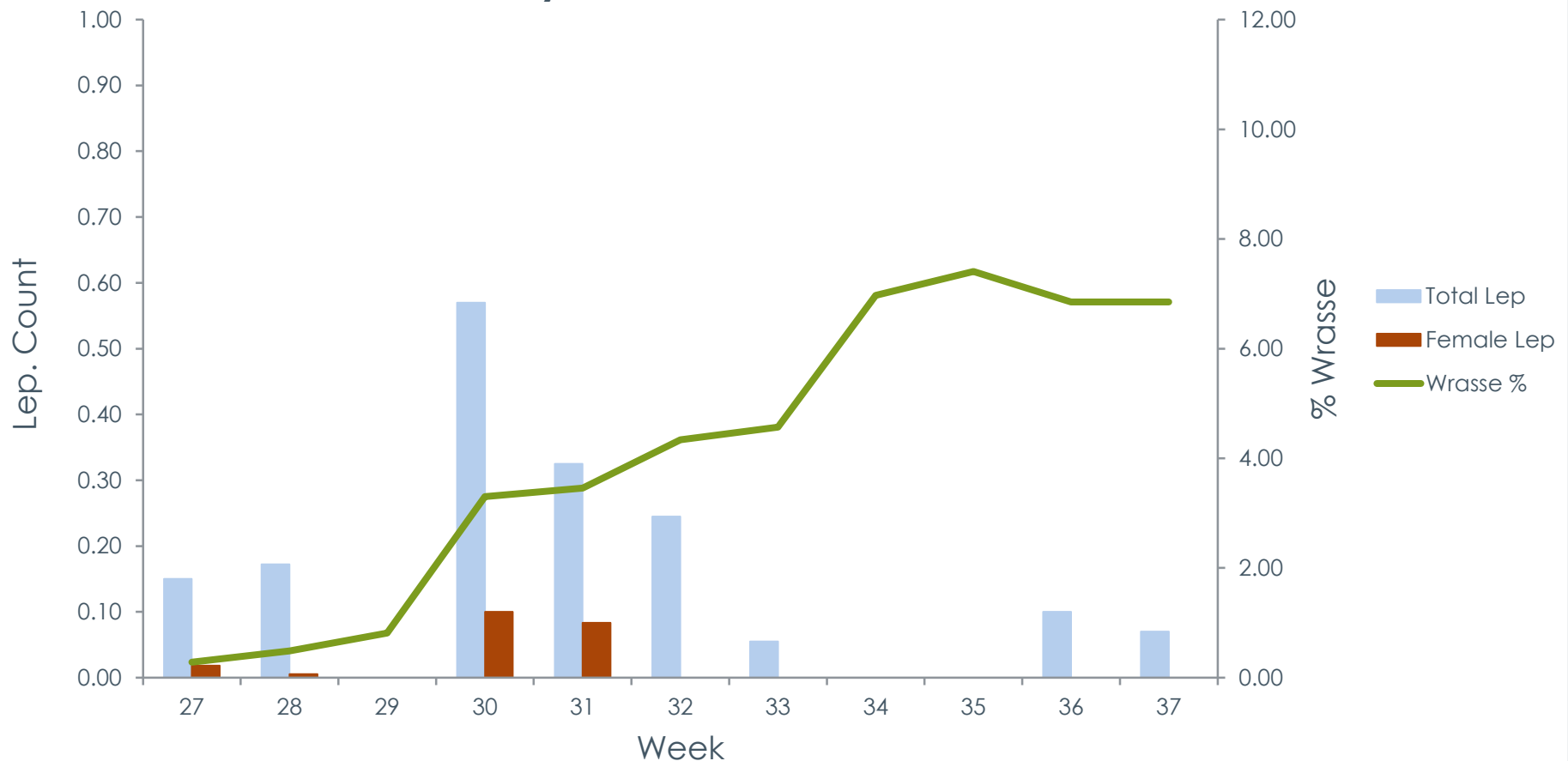


Gill inspection wrasse

WRASSE EFFICACY

Graph showing the increasing stocking numbers of wrasse plotted against the declining number of *Lepeoptheirus salmonis* present in a salmon smolt site.

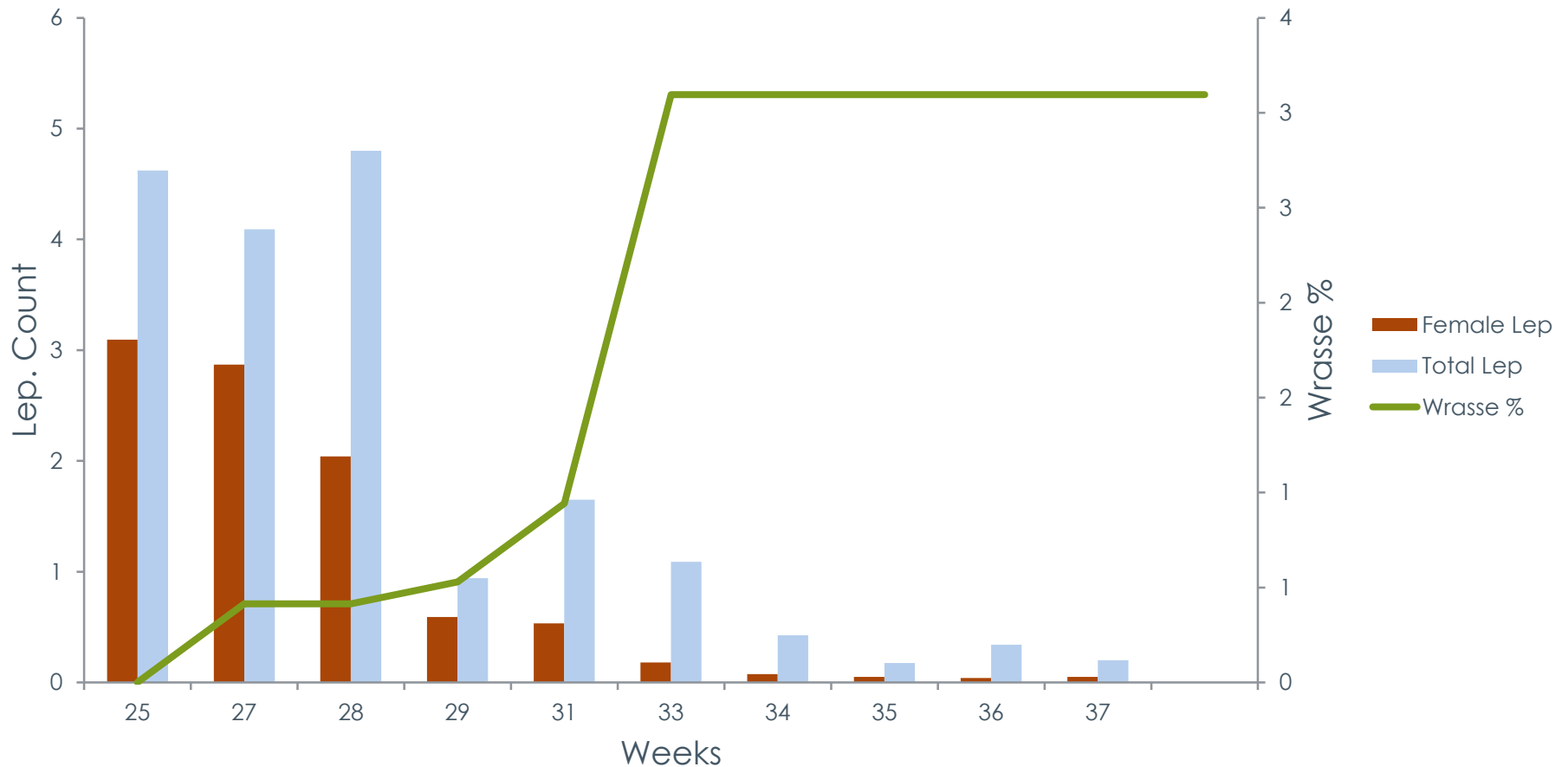
Wrasse Efficacy Grower Salmon Summer 2018



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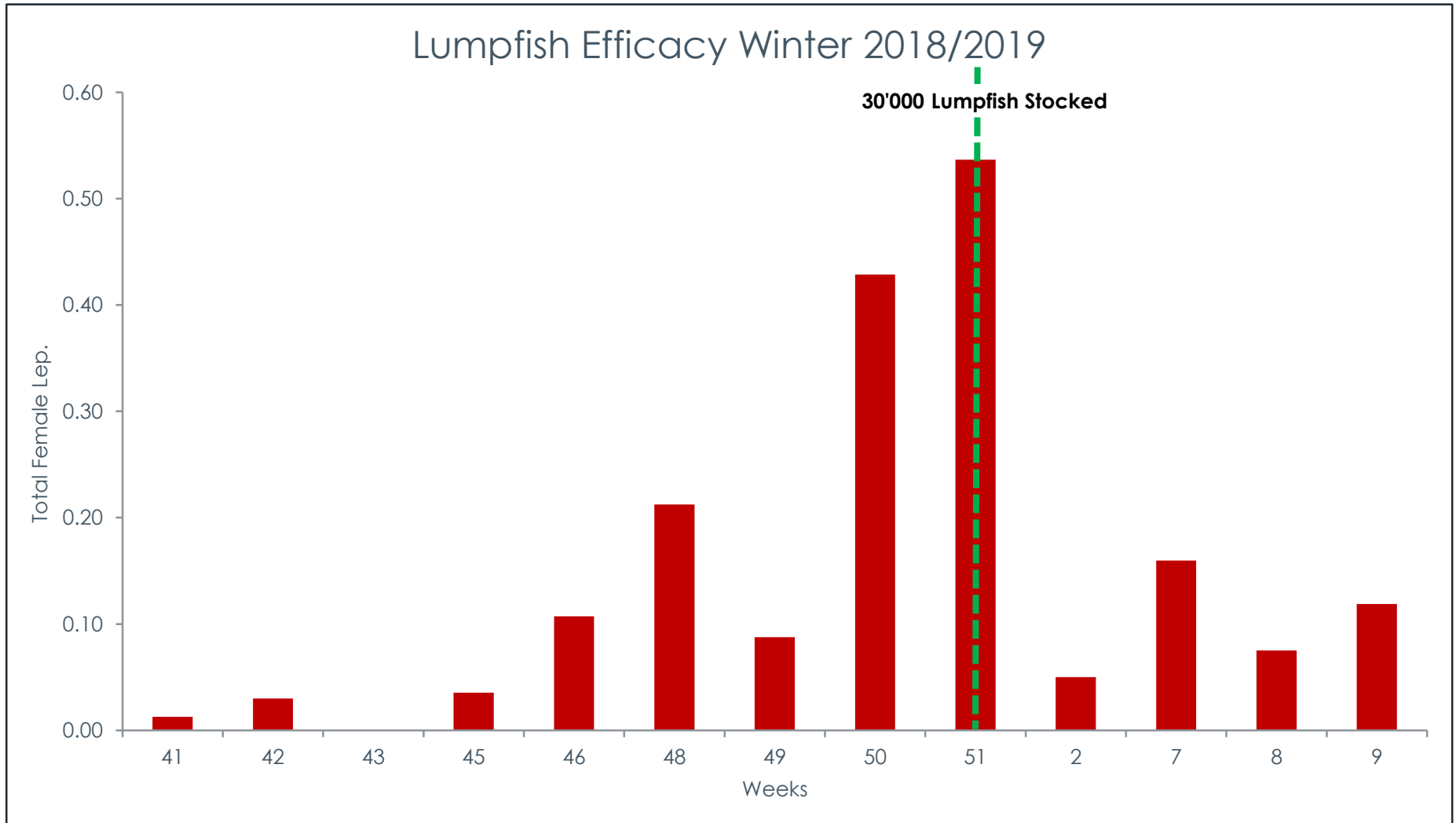
Graph showing the increasing stocking numbers of wrasse plotted against the declining number of *Lepeoptheirus salmonis* present in harvest size salmon, in pens stocked at the start of the summer.

Wrasse Efficacy Grower Salmon Summer 2018



LUMPFISH EFFICACY

Graph showing the increasing stocking numbers of wrasse plotted against the declining number of *Lepeoptheirus salmonis* present in salmon smolts.



FUTURE WORK/CONCLUSION

- More trials to be carried out on welfare in collaboration with other groups.
- The higher the condition of the fish the more productive lice eaters they will be.
- Preparation is very important before stocking cleanerfish.
- Very good developments have been made since the first use of cleanerfish.
- Still work to be done on some aspects to get it right (i.e. pre-treatment removal)

THANK YOU!