



Fish welfare guidelines within the most important labels for responsibly-farmed fish

Dan Lee
GAA
ACIG, London 2019



Open Philanthropy Project

- US\$435,000 for 3-year project
- Literature Review
- Standards Comparison
- Outreach to stakeholders
- Summary report for BAP's Standards Oversight Committee with recommended changes to standards
- Humane stunning and slaughter: tilapia and catfish (needs research); salmon more advanced





OP Mission

- *through research and grantmaking, make philanthropy improve lives*
- *share our findings openly so that anyone can build on our work*
- *maximize the impact of our giving*

OP Fish Welfare Project

- To evaluate current, and where needed develop and recommend improved, fish welfare best practices
- recommend proposed improvements to fish welfare standards organisations with a focus on internationally traded species (channel catfish, tilapia, salmon)



Fish Welfare Advisory Committee

- Randy MacMillan (USA) – Clear Springs
- Hugh Mitchell (USA) – fish veterinarian
- Randy Rhodes (USA) – Harvest Select
- Charlotte Maddocks (UK) – fish veterinarian
- Scott Williams (USA) – BJs
- Ava Li (China) – LuDong University
- TJ Tate (USA) – Seafood.Life
- Doug Waley (EU) – Eurogroup for Animals
- Kathleen Hartmann (USA) – fish veterinarian
- Keitaro Kato (Japan) – Kindai University
- Peter Hajipieris (UK) – Regal Springs
- Dave Robb (UK) – Cargill



Fish welfare
guidelines within the
most important labels
for responsibly-
farmed fish

Main sources

- *Rey S, Little D.C and Ellis, M.A. 2018. Farmed fish welfare practices: salmon farming as a case study. GAA publications.*
- *Amundsen, V. S., & Osmundsen, T. C. (2018). Sustainability Indicators for Salmon Aquaculture. Data in Brief. <https://doi.org/10.1016/j.dib.2018.07.043>*

Labels for
responsibly-farmed
fish



Salmon standards and their focus

(by number of indicators)

<u>Standard</u>	Fish Health and Welfare	Food Safety	Social Assurance	Environment + other	Total Indicators
ASC	34	5	27	86	152
BAP	30	11	41	55	137
GGAP (+GRASP)	95	36	45	91	267
RSPCA	417	0	1	50	468
SSPO	226	4	4	73	307

Adapted from: Amundsen, V. S., & Osmundsen, T. C. (2018). *Sustainability Indicators for Salmon Aquaculture. Data in Brief*.
<https://doi.org/10.1016/j.dib.2018.07.043>

Salmon standards and their focus

(by number of indicators)

<u>Standard</u>	Fish Health and Welfare	Food Safety	Social Assurance	Environment + other	Total Indicators
ASC	34	5	27	86	152
BAP	30	11	41	55	137
GGAP (+GRASP)	95	36	45	91	267
RSPCA	417	0	1	50	468
SSPO	226	4	4	73	307

Adapted from: Amundsen, V. S., & Osmundsen, T. C. (2018). *Sustainability Indicators for Salmon Aquaculture. Data in Brief*.
<https://doi.org/10.1016/j.dib.2018.07.043>

Salmon standards and their focus (by number of indicators)

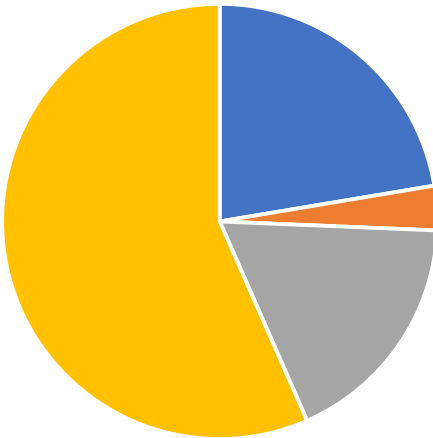
<u>Standard</u>	Fish Health and Welfare	Food safety	Social assurance	Environment + other	Total indicators
ASC	34	5	27	86	152
BAP	30	11	41	55	137
GGAP (+GRASP)	95	36	45	91	267
RSPCA	417	0	1	50	468
SSPO	226	4	4	73	307

Adapted from: Amundsen, V. S., & Osmundsen, T. C. (2018). *Sustainability Indicators for Salmon Aquaculture. Data in Brief*.
<https://doi.org/10.1016/j.dib.2018.07.043>

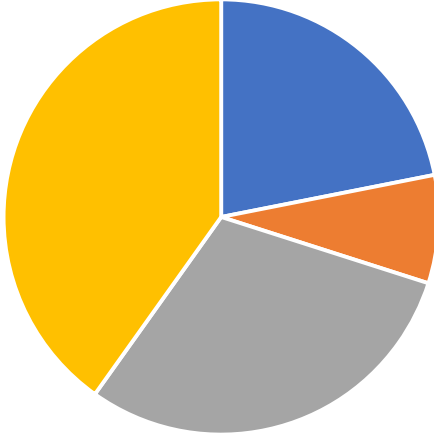
Salmon standards and their relative focus



ASC



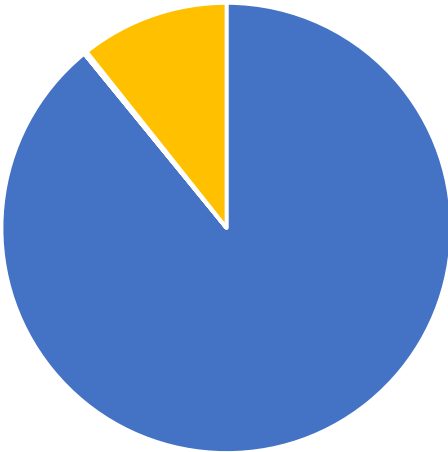
BAP



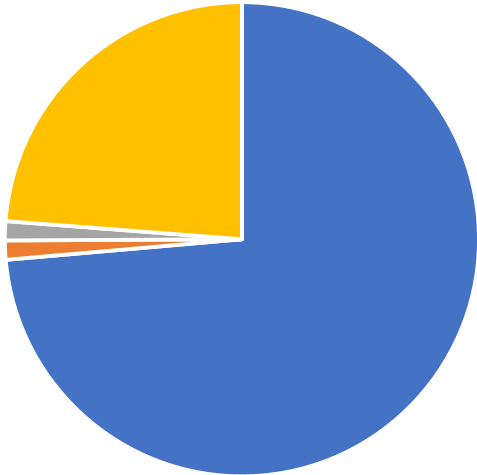
GGAP (+GRASP)



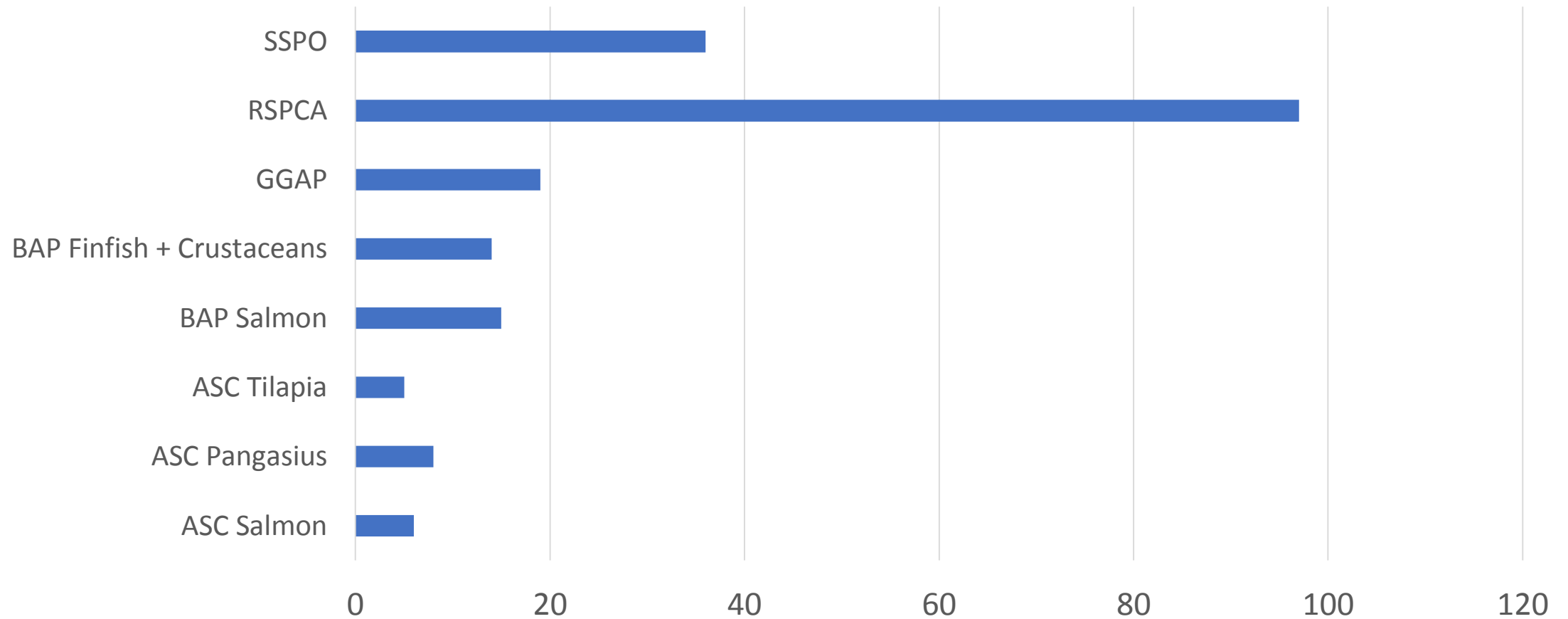
RSPCA



SSPO



Welfare Indicators (direct and indirect) for salmon and other species

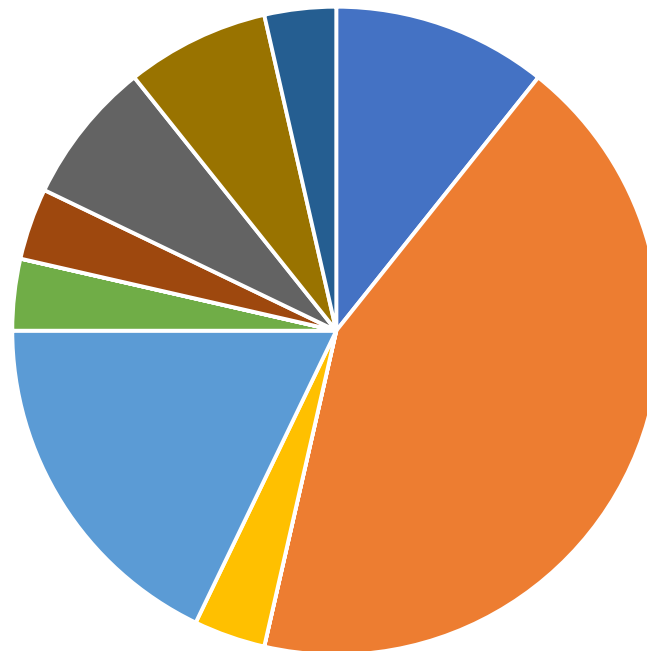


Rey S, Little D.C and Ellis, M.A. 2018. Farmed fish welfare practices: salmon farming as a case study. GAA publications.

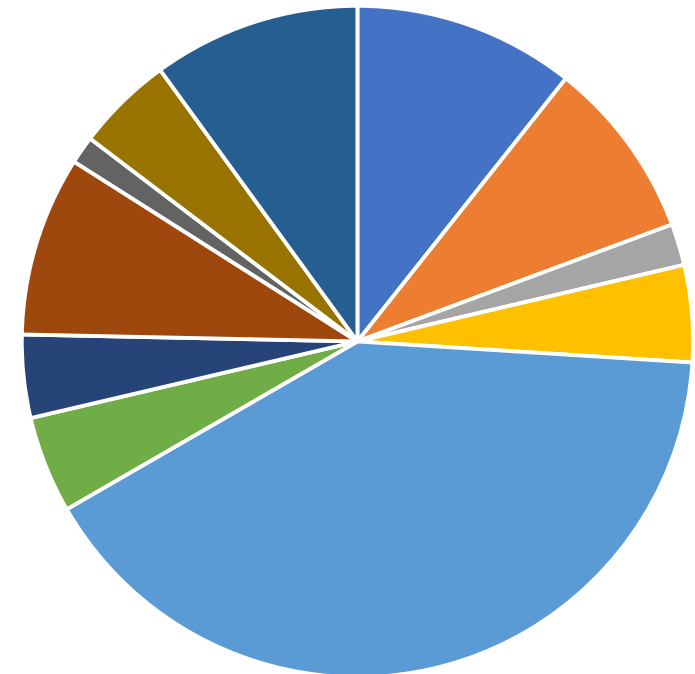
Welfare indicators* by category

- Stocking density
- Water quality
- Flow rate
- Mortalities
- Grading, Feeding, Handling, Crowding
- Smolting
- Behaviour
- Stress

BAP (n=28)



RSPCA (n=150)



**direct, indirect and 'regulatory' welfare indicators (Rey et al. 2018)*

Difficulties comparing standards

- BAP has separate standards for
 - hatchery and nursery (including smolt) units
 - processing plants (version 5 includes humane slaughter)
 - feed mills
 - farms
- How prescriptive should standards be?
- Should standards aim to be:
 - global applicable and consistent, or
 - more country and species specific?
- Are indicators consistently handled in the audit process?
 - pass/fail (BAP)
 - major must/minor must/recommendation (GGAP)
 - pass/fail/variance request (ASC)
- When auditor time is limited, more indicators implies less time to assess each indicator

Stocking density

Soil Association (Organic)	10 kg/m ³ in seawater net pens (for salmonids)
RSPCA	Seawater enclosure site maximum: 15 kg/m ³
BAP Salmon	at or below an average 25 kg/m ³
GGAP	[In summary] density limits shall be set and not exceeded
ASC Salmon	<i>(stocking density during on-growing is not referenced)</i>
SSPO	Stocking density should be monitored in relation to fish health, fish behaviour and water quality to ensure that fish welfare is not compromised



Simple definition of good
welfare:

*an animal is healthy and
has what it wants*

Welfare Indicators

Operational Welfare Indicators (OWI)

- On-farm measurements made by farm staff, properly trained to recognise and evaluate them
- Most are based on routine husbandry procedures and production measurements

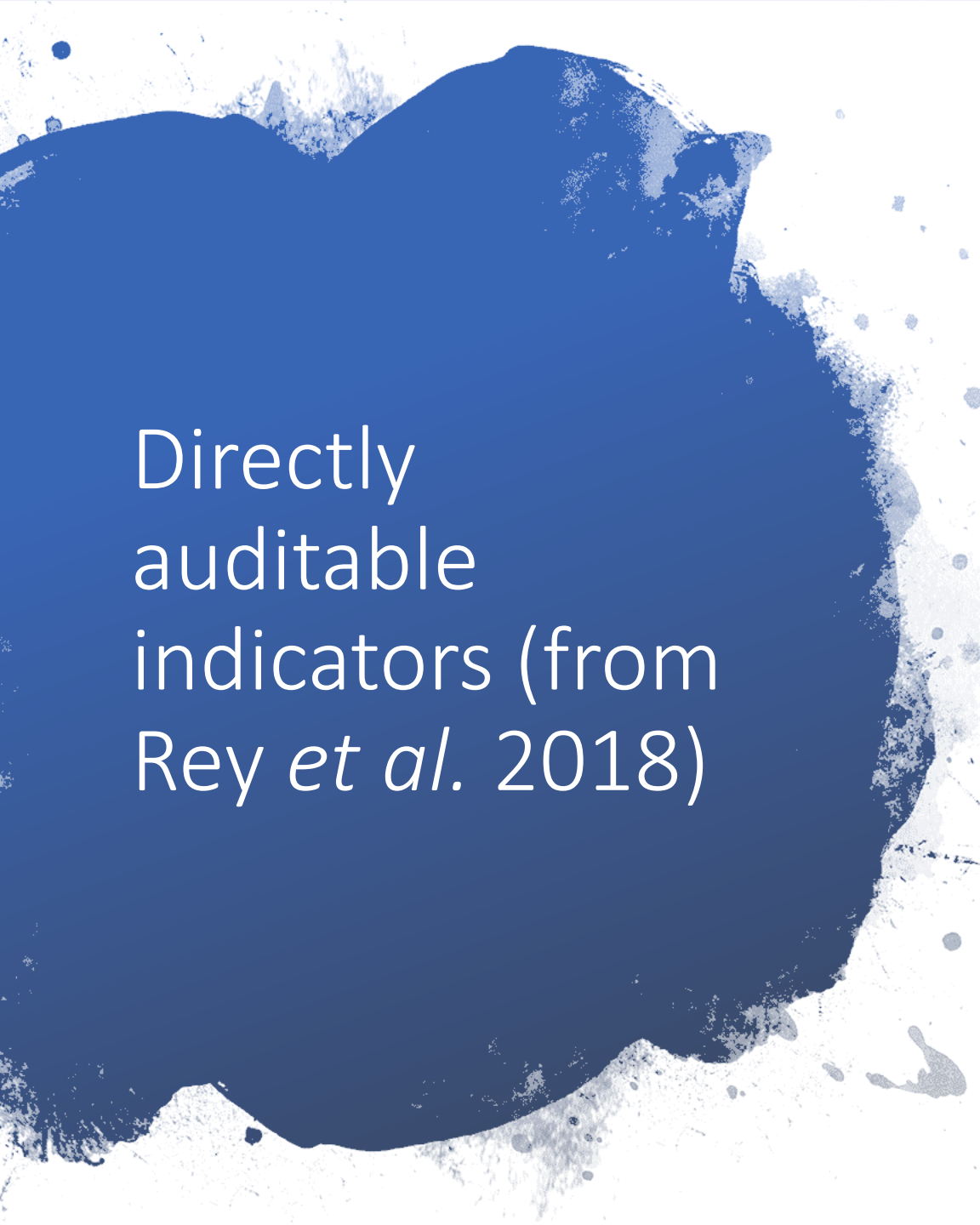
Non-Operational Welfare Indicators

- e.g. those measurements made by vets

Directly auditable welfare indicators

- quantifiable (or at least qualitatively assessed by scoring or checklist)
- relevant to the welfare status of the animal
- able to be assessed by staff and not disruptive of normal operations

(Rey *et al.* 2018)



Directly auditable indicators (from *Rey et al. 2018*)

Stocking density

- Record stocking density, retrievable mortalities and final survival. Raw data or %

Water quality

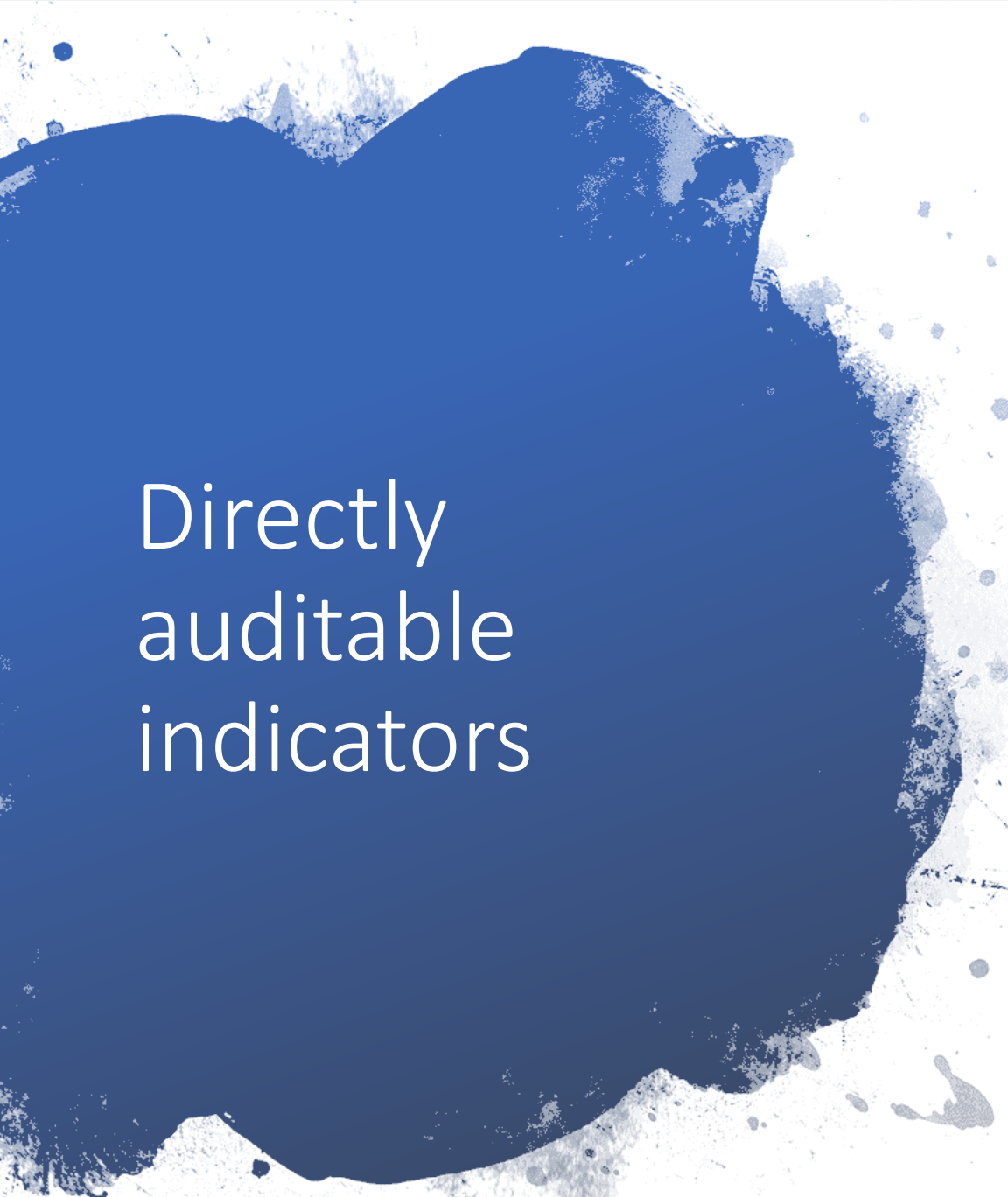
- Already incorporated in most certification schemes. Checklist and raw data

Flow rate

- Important parameter in itself and to calculate water exchange; system specific. Raw data

Mortalities

- Monitored if possible –to detect timing of any acute episodes as well as calculated at harvest



Directly auditable indicators

Grading

- Easy to include in farm records either as grade or no grade at different sizes or % in different size cohorts. Checklist or raw data

Feeding

- Feeding levels should be in farm records to allow independent auditing of feeding consistency and as a proxy for feed response and vitality. Temperature dependent. Raw data

Handling

- Class handling into 'likely to physically damage for example/scale loss scoring index. Likely related to species and size. Training by use of optimal technique by video. Checklist and evaluation of training

Crowding

- Working volumes recommended, use of aeration/DO levels/duration of crowding event. Scoring system from best to worst conditions



Directly auditable indicators

Smolting

- Only applicable for salmon. Similar indicators for other species would be sexual maturation. Scoring system

Behaviour

- Feeding response after stressor: transport, vaccination, grading, etc. Raw data by latencies to eat or scoring system (% of fish eating/time from stressor applied)

Positive welfare

- e.g. in tilapia breeding systems provision of nest environments Checklist (yes/no)

Cortisol

- Not operational unless reactive strips are developed for cortisol in mucus. Invasive by blood sampling. Raw data

Stress

- Behavioural indicators of stress e.g. feeding response (see in feeding), shoaling.



Directly auditable indicators

Slaughter

- Strong national rules. Check list or scoring system from more to less humanely

Harvest

Physical Health

- Direct Operational Welfare Indicators (OWI) by scoring systems (colour changes (eye darkening), body condition

Injury/damage

- Often linked to handling.

Bleed

- When dead. Checklist

Sea lice

- Only in salmon. Other parasites for other species



Seafood Processing Standard (SPS)

Issue 5.0 – 1 – February – 2019

8.0 Animal Welfare – For Farm-Raised Species

- 8.1 Transport
- 8.2 Holding Facilities
- 8.3 Slaughter



Thank you



dan.lee@gaalliance.org

