

FISH HEALTH ASSESSMENT DECISION GUIDING TREE

How this tool works

- You will be guided through a series of questions
- Select the option that best matches your fish health assessment goals
- Your selections will narrow down the most appropriate assessment method(s)

**CLICK
HERE TO
BEGIN!**

WHAT IS YOUR PURPOSE FOR FISH HEALTH ASSESSMENT?

MONITORING

DIAGNOSTIC

GO BACK

IS THE STRESSOR KNOWN/SUSPECTED OR UNKNOWN?

KNOWN

UNKNOWN

GO BACK

MONITORING → **KNOWN
STRESSOR**

ARE YOU TARGETING WILD OR CAPTIVE FISH?

WILD

CAPTIVE

GO BACK

MONITORING → **UNKNOWN
STRESSOR**

ARE YOU TARGETING WILD OR CAPTIVE FISH?

WILD

CAPTIVE

GO BACK

MONITORING → **KNOWN STRESSOR** → **WILD**

**WILL YOU BE REQUIRING ANALYSES OF LETHALLY OR
NON-LETHALLY COLLECTED SAMPLES?**

LETHAL

NON-LETHAL

GO BACK

MONITORING → **KNOWN STRESSOR** → **CAPTIVE**

**WILL YOU BE REQUIRING ANALYSES OF LETHALLY OR
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NON-LETHAL

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MONITORING → **UNKNOWN STRESSOR** → **WILD**

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AVAILABLE OPTIONS

STP CHIP






RNA-SEQ



GO BACK

For more information, click on one of the options above

-  Best option
-  Proceed with caution
-  Possible, but not recommended

MONITORING → **UNKNOWN STRESSOR** → **CAPTIVE** → **NON-LETHAL**

AVAILABLE OPTIONS

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NECROPSY



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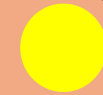
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What is it?

- Stress Transcriptional Profiling (STP) via the GEN-FISH STP Chips uses targeted qPCR to quantify the expression of known-function and stress response genes
- Measures early molecular responses to environmental stressors

When is it most useful?

- When stressors are known
- When large sample sizes are needed

STP Chip Considerations

- **Cost per sample:** ~\$20.00/sample (28-gene chip; 48 samples; [Environmental Genomics Facility](#))
- **Sample size:** ≥ 48 samples is ideal, but useable with smaller sample sizes as well (e.g., 5-10)
- **RNA quality:** High, but less strict than RNA-Seq, making it a good option for cultured or wild sampling
- **Sampling:** non-lethal tissues are often sufficient (e.g., gill filaments), but lethally collected tissues may be necessary depending on goals (e.g., liver for growth and metabolism insights)
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RNA-Seq

What is it?

- RNA sequencing profiles a fish's entire transcriptome (all expressed genes in a given target tissue)

When is it most useful?

- When stressors are either known or unknown
- When a broad analysis is needed

RNA-Seq Considerations

- **Cost per sample:** ~172/sample (2025 estimate; Genome Quebec); ~\$147/sample at ≥ 60 samples
- **Turnaround time:** Several weeks for sequencing and data processing
- **RNA quality:** Very high (must be carefully considered and sampling procedures must be followed closely if planning to use for wild fish)
- **Sampling:** Typically requires lethally collected tissues, though non-lethal sampling is possible
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Necropsy

What is it?

- A traditional post-mortem examination used to assess fish health
- Used to determine cause of death, disease presence, or overall health status (e.g., during stock decline)

When is it most useful?

- When the cause of stress or mortality is known or suspected
- When the primary goal is diagnostic

Necropsy Considerations:

- **Sampling:** Requires euthanasia; no non-lethal option
- **Sample size:** Often smaller than molecular approaches
- **Cost per fish:** Approximately **\$50-150** in Canada, depending on provider and services included
- **Turnaround times and interpretation:** Diagnostic findings are typically clearly communicated to fisheries managers, with minimal data processing required



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STP CHIP






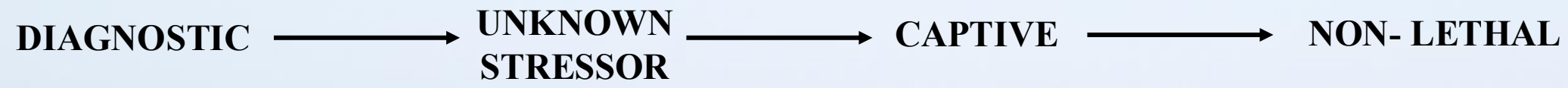
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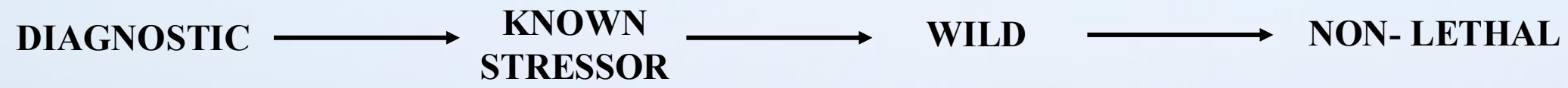
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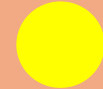
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When is it most useful?

- When stressors are known
- When large sample sizes are needed

STP Chip Considerations

- **Cost per sample:** ~\$20.00/sample (28-gene chip; 48 samples; [Environmental Genomics Facility](#))
- **Sample size:** ≥ 48 samples is ideal, but useable with smaller sample sizes as well (e.g., 5-10)
- **RNA quality:** High, but less strict than RNA-Seq, making it a good option for cultured or wild sampling
- **Sampling:** non-lethal tissues are often sufficient (e.g., gill filaments), but lethally collected tissues may be necessary depending on goals (e.g., liver for growth and metabolism insights)
- **Additional costs:** Bioinformatics and data analysis may apply

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Click the GEN-FISH logo to see which STP chip suits your needs:



STP CHIP

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RNA-Seq

What is it?

- RNA sequencing profiles a fish's entire transcriptome (all expressed genes in a given target tissue)

When is it most useful?

- When stressors are either known or unknown
- When a broad analysis is needed

RNA-Seq Considerations

- **Cost per sample:** ~172/sample (2025 estimate; Genome Quebec); ~\$147/sample at ≥ 60 samples
- **Turnaround time:** Several weeks for sequencing and data processing
- **RNA quality:** Very high (must be carefully considered and sampling procedures must be followed closely if planning to use for wild fish)
- **Sampling:** Typically requires lethally collected tissues, though non-lethal sampling is possible
- **Additional costs:** Bioinformatics services are generally recommended due to data volume



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Necropsy

What is it?

- A traditional post-mortem examination used to assess fish health
- Used to determine cause of death, disease presence, or overall health status (e.g., during stock decline)

When is it most useful?

- When the cause of stress or mortality is known or suspected
- When the primary goal is diagnostic

Necropsy Considerations:

- **Sampling:** Requires euthanasia; no non-lethal option
- **Sample size:** Often smaller than molecular approaches
- **Cost per fish:** Approximately **\$50-150** in Canada, depending on provider and services included
- **Turnaround times and interpretation:** Diagnostic findings are typically clearly communicated to fisheries managers, with minimal data processing required



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**WHICH OF THE FOLLOWING TAXONOMIC GROUPS
DOES YOUR SPECIES OF INTEREST BELONG TO?**

SALMONIFORMES

ACIPENSERIFORMES

PERCIFORMES

PETROMYZONTIFORMES

CYPRINIFORMES

ANGUILLIFORMES

OTHER



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AVAILABLE STP CHIPS: SALMONIFORMES

GENERAL STRESS

OSMOTIC STRESS

TRANSPORT STRESS

NEURAL (BRAIN CHIP)

IMMUNE FUNCTION

CIRCADIAN RHYTHM

MUCUS CHIP

For more details, click on one of the listed categories to help guide the right STP chip for your needs

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GENERAL STRESS STP CHIPS: SALMONIFORMES

SAL_STP3V1_56 (56 gene chip)

- Apoptosis
- Detoxification
- Growth & Metabolism
- Hypoxia
- Immune Function
- Osmoregulation

SAL_STP2V2_56 (56 gene chip)

- Apoptosis
- Detoxification
- Growth & Metabolism
- Hypoxia
- Stress Response

SAL_STP2V3_56 (56 gene chip)*

- Apoptosis
- Circadian Rhythm
- Detoxification
- Growth & Metabolism
- Hypoxia
- Immune Function
- Osmoregulation
- Stress Response

*Most popular: SAL_STP2V3_56

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CLICK HERE if other gene function categories are required



IMMUNE FUNCTION STP CHIP: SALMONIFORMES

For access to more tools, resources, and Omics experts, click the GEN-FISH logo above.

SAL_IMM1V1_28 (28 gene chip)

- Apoptosis
- Immune Function
- Metabolism
- Stress Response

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CIRCADIAN RHYTHM STP CHIP: SALMONIFORMES

For access to more tools, resources, and Omics experts, click the GEN-FISH logo above.

SAL_CIRC1V1_28 **(28 gene chip)**

- Circadian Rhythm

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NEURAL STP CHIP: SALMONIFORMES

For access to more tools, resources, and Omics experts, click the GEN-FISH logo above.

SAL_NEU1V2_28

(28 gene chip)

- Appetite/Metabolism
- Stress Response
- Neural Development/Differentiation

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TRANSPORT STRESS STP CHIP: SALMONIFORMES

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SAL_STP4V1_28

(28 gene chip)

- Growth & Metabolism
- Hypoxia & Metabolism
- Immune Function
- Osmoregulation
- Stress Response

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MUCUS STP CHIP: SALMONIFORMES

For access to more tools, resources, and Omics experts, click the GEN-FISH logo above.

SAL_STP4V1_28

(28 gene chip)

- Detoxification
- Immune Function
- Metabolism
- Stress Response

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OSMOTIC STRESS STP CHIP: SALMONIFORMES

For access to more tools, resources, and Omics experts, click the GEN-FISH logo above.

SAL_OSM1V1_28

(28 gene chip)

- Growth & Metabolism
- Immune Function
- Osmoregulation
- Stress Response

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STP CHIPS: PERCIFORMES

For access to more tools, resources, and Omics experts, click the GEN-FISH logo above.

PER_STP1V1_28 (28 gene chip)

- Endocrine Disruption
- Growth & Metabolism
- Immune Function
- Stress Response

PER_STP2V1_28 (28 gene chip)

- Detoxification
- Hypoxia/Metabolism
- Immune Function
- Stress Response

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STP CHIPS: CYPRINIFORMES

For access to more tools, resources, and Omics experts, click the GEN-FISH logo above.

CYP_STP1V1_28 **(28 gene chip)**

- Endocrine Disruption
- Growth & Metabolism
- Immune Function
- Stress Response

CYP_STP2V1_28 **(28 gene chip)**

- Detoxification
- Hypoxia/Metabolism
- Immune Function
- Stress Response

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STP CHIP: PETROMYZONTIFORMES

For access to more tools, resources, and Omics experts, click the GEN-FISH logo above.

LAMP_STP1V1_56

(56 gene chip)

- Apoptosis
- Circadian Rhythm
- Detoxification
- Hypoxia/Metabolism
- Osmoregulation
- Stress Response

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STP CHIP: ANGUILLIFORMES

For access to more tools, resources, and Omics experts, click the GEN-FISH logo above.

American Eel Chip (28 gene chip)

- Detoxification
- Immune Function
- Osmoregulation
- Stress Response

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OTHER: DESIGN STP CHIP

When is designing a custom STP Chip most useful?

- If your species of interest does not belong to any of the existing chips
- Need to target different functional gene categories

Considerations:

- Requires expertise – consider collaboration if in-house expertise is not available
- STP Chips are ordered in packs of ten
- Each 28-gene chip can run 48 samples in replicate
- Cost effective only for large sample sizes (480 samples) or if chips will be used often (e.g., monitoring)

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