

**Maintenance of Ontario's Aquaculture Statistics Program:  
AQUASTATS**

**Final Report submitted to:**

Ontario Ministry of Natural Resources

**Submitted by:**

**Richard D. Moccia and David J. Bevan**

**Aquaculture Centre**



**31<sup>st</sup> March 2011**

## **Introduction**

The primary objective of this project was to conduct a survey of the geographical distribution and production output of commercial aquaculture operations in Ontario for the calendar year 2010, in order to maintain our well-established industry database which has been under development since 1988<sup>1</sup>. This database is utilized on an on-going basis to evaluate the performance characteristics of the industry, with the ultimate goal of assisting with the orderly development of aquaculture in this province. The information collected provides the content for the ongoing factsheet series AQUASTATS – Ontario Aquacultural Production Statistics. OMNR will use the data to support the Canadian Council of Fisheries and Aquaculture Ministers (CCFAM) aquaculture development initiatives. More specifically, the data will support the Sustainability Reporting Initiative led by Fisheries and Oceans Canada (DFO) to report to Canadians and Ontarians on progress made toward the shared objective to set the conditions for an aquaculture sector that is environmentally sound, socially responsible and economically competitive. Additionally, some of the compiled information will be forwarded to Statistics Canada as a part of the national aquacultural statistics summary.

## **Methods**

A survey questionnaire was developed to collect information on:

- type of facility
- species raised
- employment
- annual production
- value of production

The survey frame was determined from previous surveys and knowledge of the industry participants. The frame was divided into two sections based upon expected scale of production. Facilities that were expected to produce more than approximately 5,000 kg or \$10,000 of sales per year were sent a detailed questionnaire (Long Format Questionnaire). All others were sent a simplified version (Short Format Questionnaire). A total of 50 surveys were distributed on Jan 19<sup>th</sup> 2011 (see Appendix I – III).

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<sup>1</sup> Earlier factsheets are available online at: <http://www.aps.uoguelph.ca/aquacentre/information/publications.php>

## INDUSTRY SNAPSHOT 2010

<b>Major Species Produced</b>	- rainbow trout
<b>Minor Species Produced</b>	- Arctic charr, tilapia, brook trout, smallmouth and largemouth bass, cyprinid baitfish
<b>Total Trout Production</b>	- 4,060 tonnes
<b>Farm-gate Value of Trout</b>	- \$17.1 million
<b>Economic Contribution</b>	- \$60 million
<b>Job Creation</b>	- 144 person-years direct and - 150 person-years indirect employment
<b>Projected Production of Trout</b>	- approximately 4,000 tonnes in 2011

### Results

In 2010, we estimate that Ontario fish farms produced 4,060 tonnes (8.95 million pounds) of rainbow trout, primarily for human consumption (Figure 1). This is a 5% decrease from the 4,260 tonnes produced in 2008. Survey questionnaires were received from 54% of the facilities surveyed accounting for 69.8% of the total production. Estimates for non-reporting facilities were based on prior surveys and personal experience.

Lake-based cage production of trout in the Georgian Bay area continues to dominate other land-based production systems, accounting for 88 % of the total production (Figure 2). Arctic charr production is very limited and production has remained at nominal levels for several years now. Similarly, tilapia production is minimal. Our records suggest that the combined production was approximately 55 tonnes in 2010. The production of brook trout and bass is primarily geared towards pond stocking and recreational purposes. These operations provide an important diversity to the industry although quantifiable information is scarce. Our records suggest that approximately 60 facilities culture brook trout, bass and other species, with a total production of approximately 20 tonnes annually.

The geographical distribution of farms producing more than 5 tonnes per year is concentrated in the south-western and the Georgian Bay – Manitoulin island regions (Figure 3).

Changes in farm size, in terms of number and production, between 1988 and 2010 are shown in Figures 4a and 4b, respectively.

The total farm-gate value of the 4,060 tonnes of rainbow trout produced is estimated to be \$17.1 million, with an average price of \$1.91/lb (\$4.21/kg). The sale of tilapia, charr, bass and other fish species is estimated to be an additional \$1.0 million in 2010. More than 60 facilities are involved with pond stocking, typically rainbow trout, brook trout and bass. The value of this aquaculture sector is conservatively estimated to be \$1.5 million annually.

In 2010, the Ontario aquaculture industry is estimated to have generated a total of 144 person-years of direct, on-farm employment. This consisted of 98 person-years of full-time employment (40 hours per week for 12 months) and 46 person years of part-time employment. Indirect employment is conservatively estimated at 150 person-years.

The total annual contribution that aquaculture makes to the Ontario economy is estimated to be \$60 million, with additional economic value realised via the recreational and aquaria trade.

Figure 1. Ontario farmed trout production between 1962 and 2010.

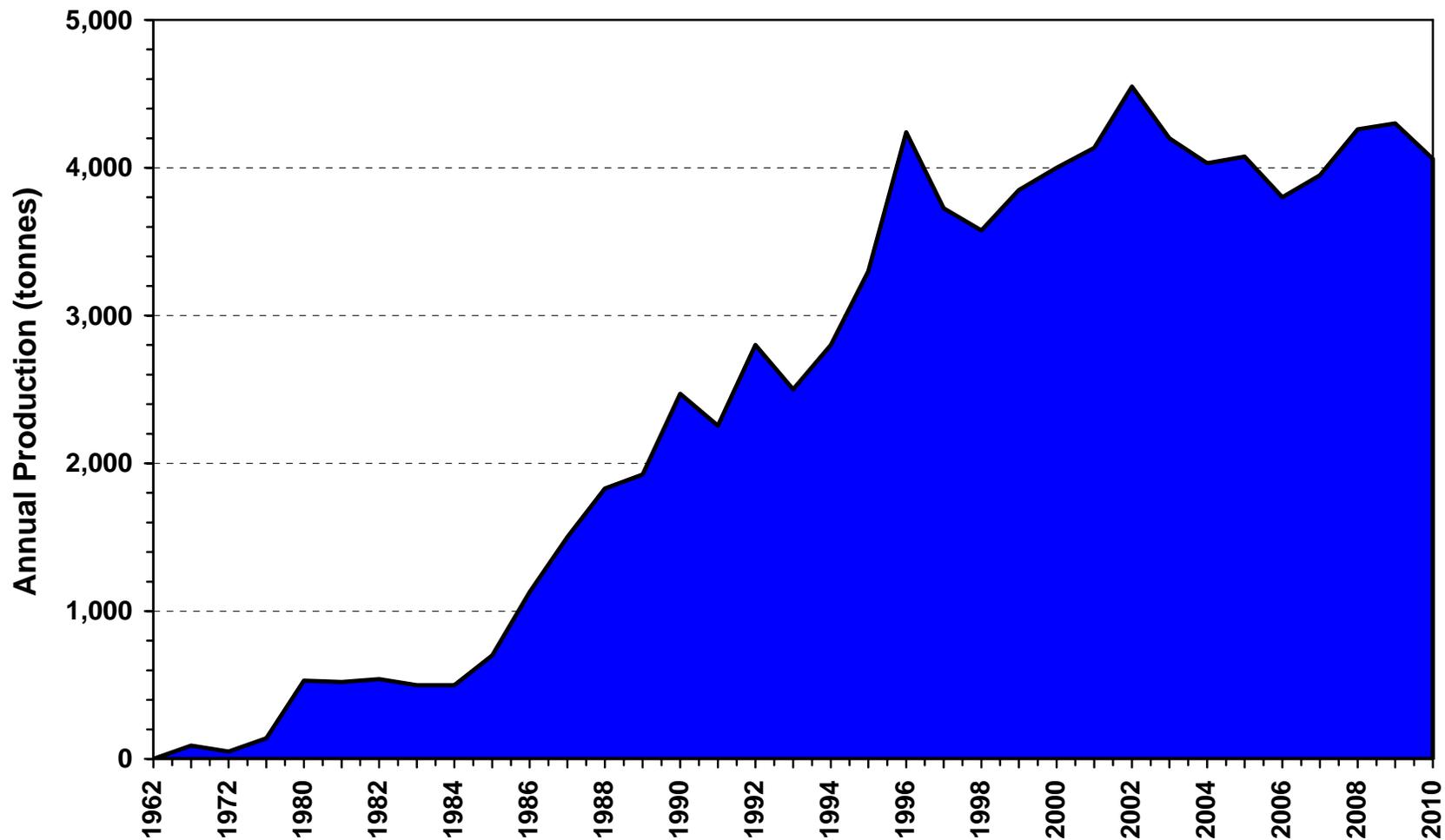
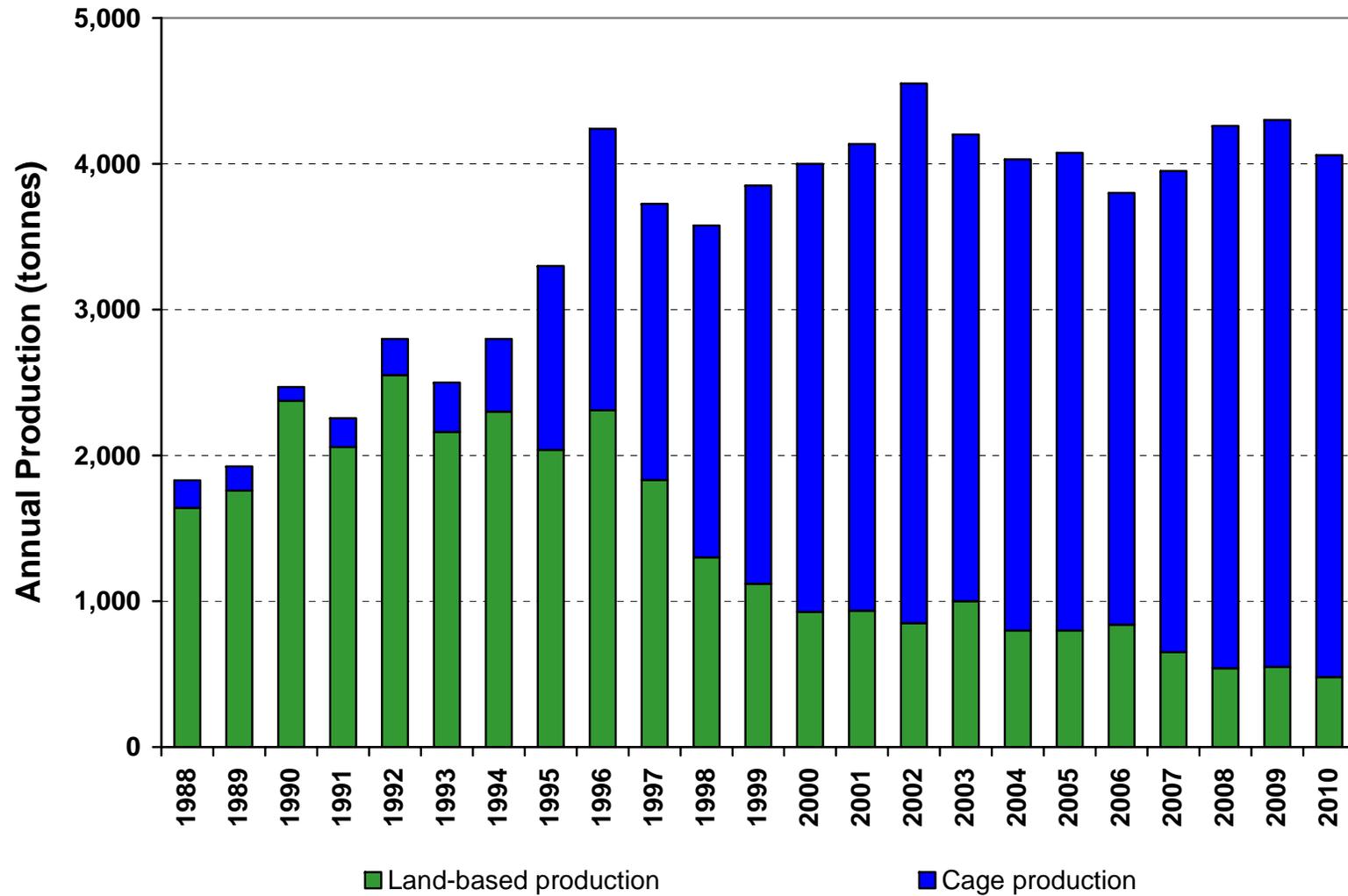
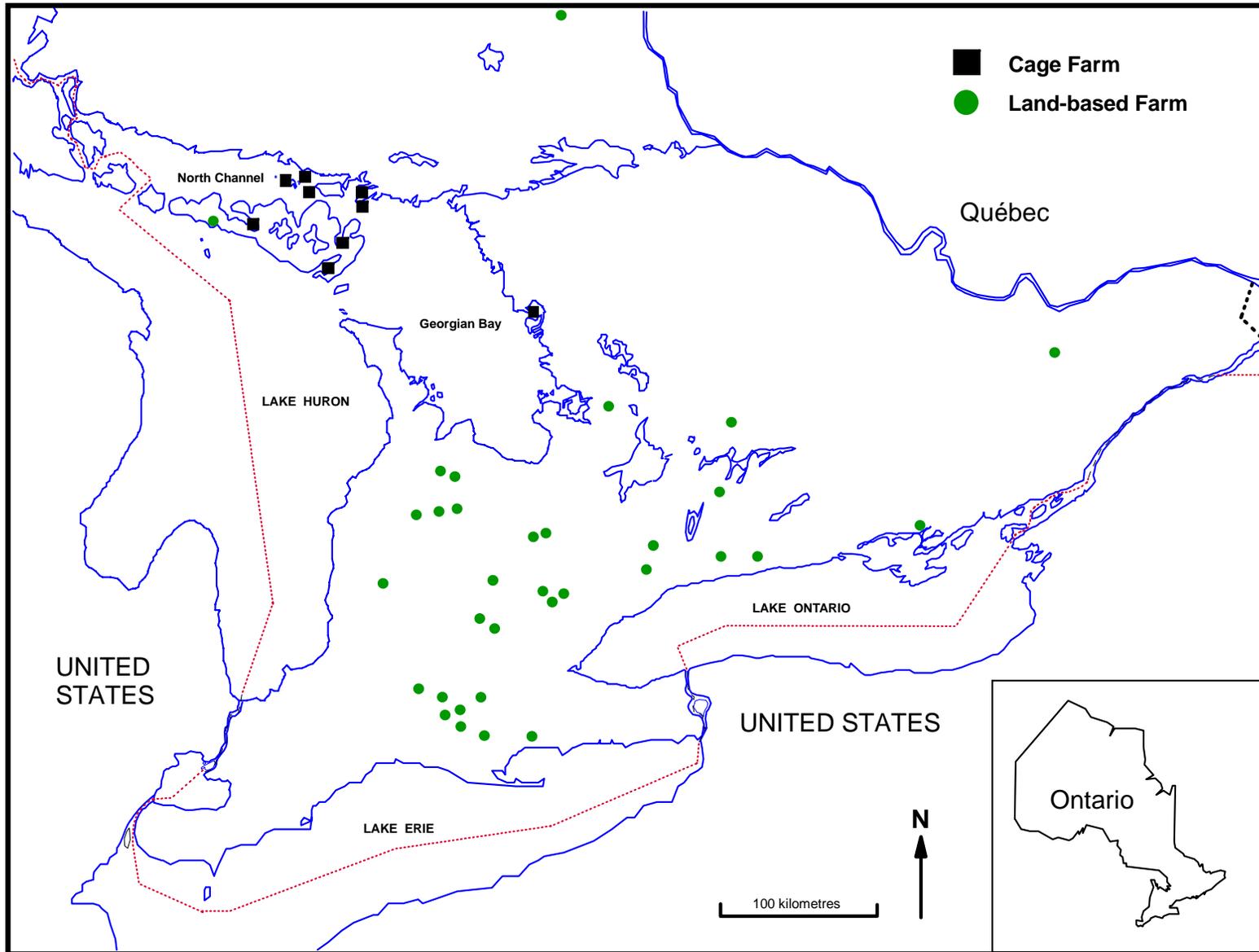


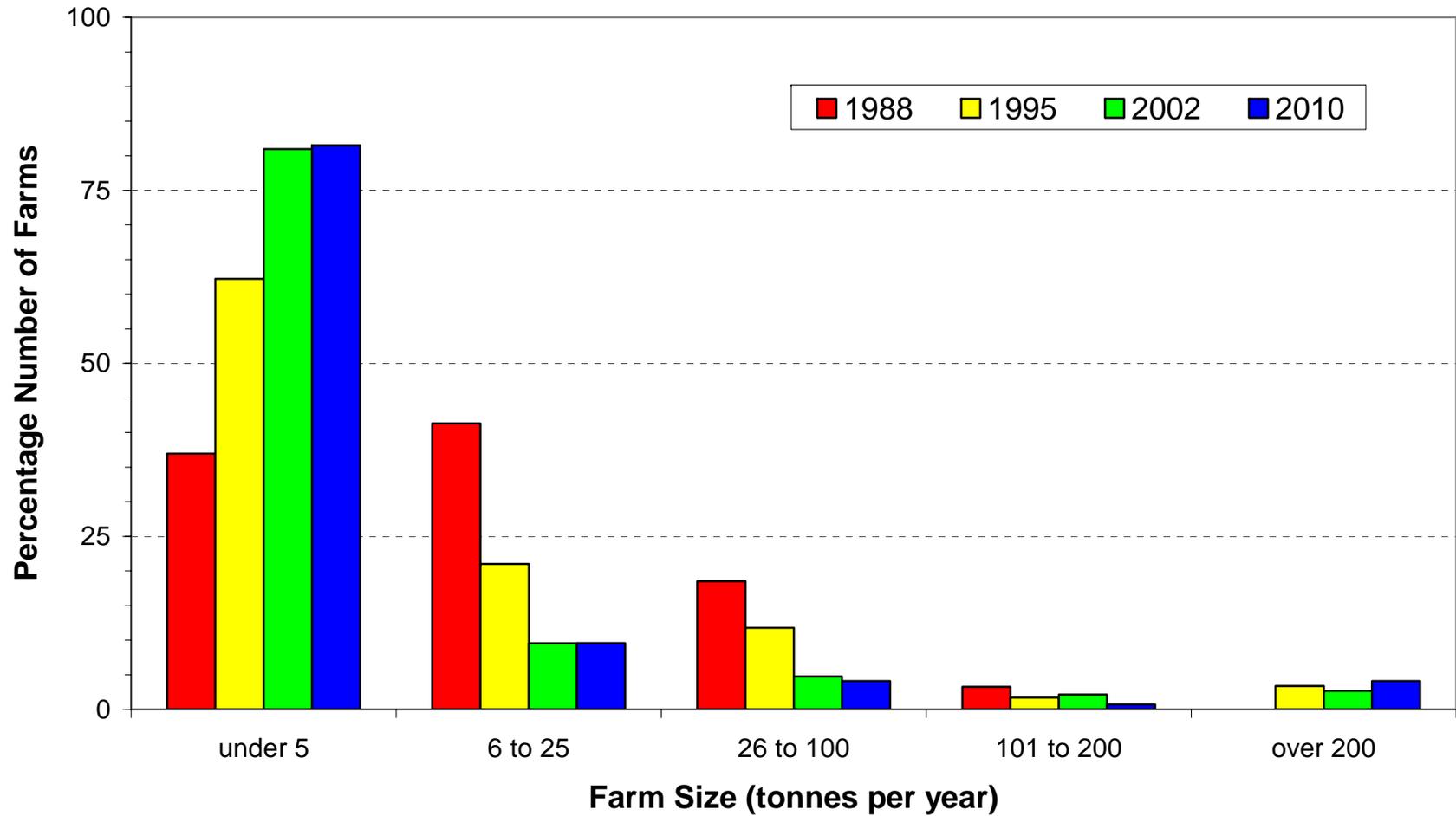
Figure 2. Comparison of Ontario land-based and cage aquaculture between 1988 and 2010.



**Figure 3. Distribution of fish farms in Ontario producing more than 5 tonnes in 2010.**

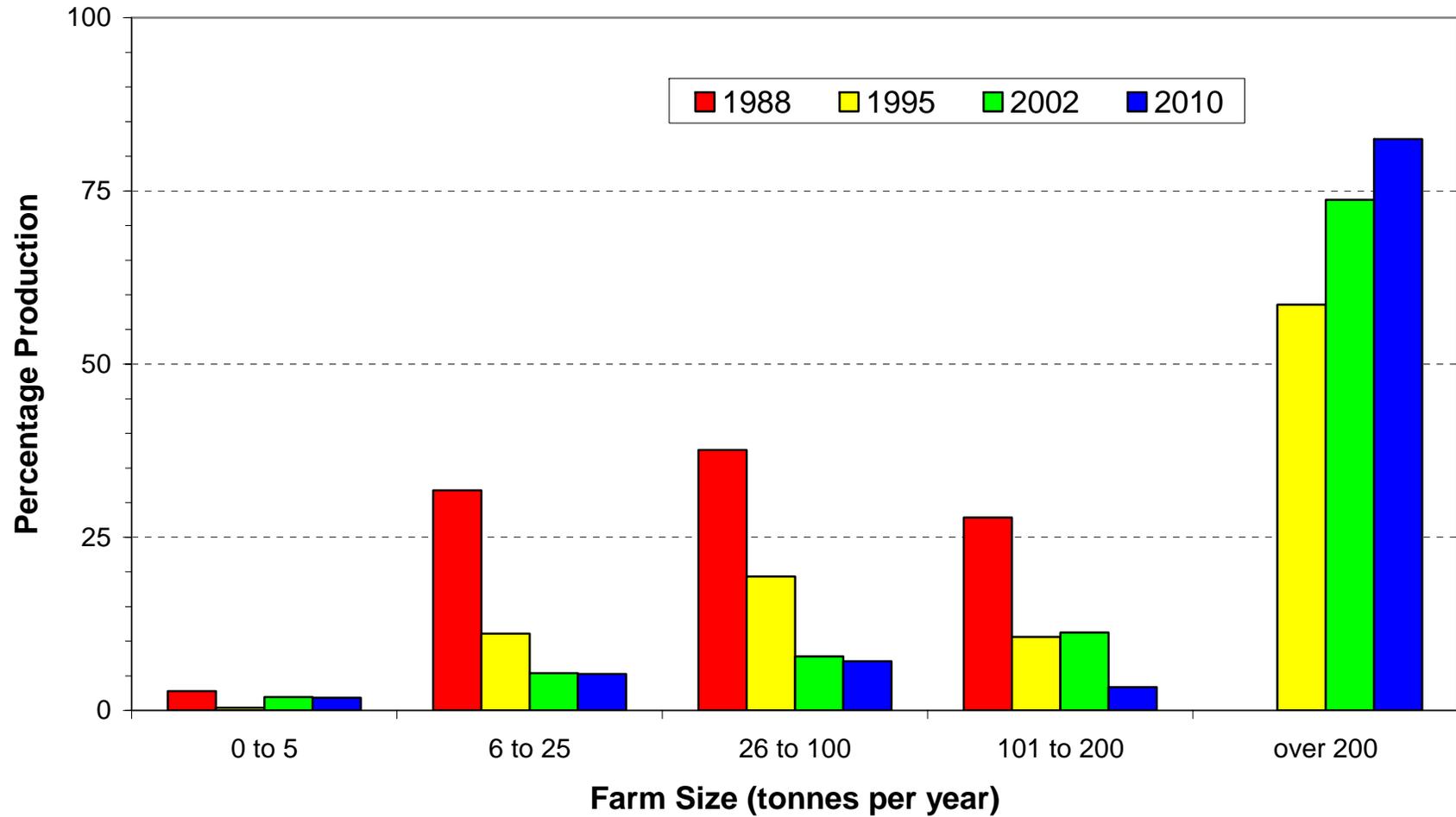


**Figure 4a. Change in farm size (% number) between 1988 and 2010.**



*Note: percentage number of farms under 5 tonnes is provisionally estimated for 2010.*

**Figure 4b. Change in farm size (% production) between 1988 and 2010.**



*Note: percentage number of farms under 5 tonnes is provisionally estimated for 2010.*

## Appendix I. AQUASTATS Survey Introduction Letter



ONTARIO AGRICULTURAL COLLEGE  
Department of Animal And Poultry Science

January 17<sup>th</sup> 2011

### Ontario Aquaculture Statistics Survey - 2010

Dear Producer,

This is our 21<sup>st</sup> AQUASTATS survey of fish production in Ontario, made possible with a lot of support from you, the producer.

Over these 20 years **Ontario aquaculture has evolved into a valuable component of the economy.** There have been several major milestones over this period. Open-water cage culture is now the dominant production method, the end product is primarily boneless fillets, several industry associations have evolved and legislative issues continue to dominate expansion opportunities.

This year **we need your assistance once again.** The enclosed questionnaire addresses four main areas: 1) quantity produced, 2) value of production, 3) employment and 4) structure of the industry. Please report information for the calendar year January 1<sup>st</sup> to December 31<sup>st</sup>, 2010.

If you feel that the questions do not apply to your situation, please return the questionnaire and indicate the reasons. We need to have all the questionnaires returned - either complete or incomplete to establish a true picture of the industry today. If you have any questions or comments about the questionnaire, please do not hesitate to contact us. **Please return the questionnaire before February 14<sup>th</sup> 2011.**

As previously, **all information will be treated in the strictest of confidence** and only composite industry statistics will be released.

**Please accept our thanks** for assisting us with this ongoing project.

Yours truly,

A handwritten signature in black ink, appearing to read "R. Moccia".

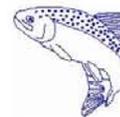
Richard D. Moccia  
Professor  
Tel. 519-824-4120 ext. 56216  
Email: rmoccia@uoguelph.ca

A handwritten signature in black ink, appearing to read "David J. Bevan".

David J. Bevan  
Research Assistant  
Tel. 519-824-4120 ext. 52689  
Email: dbevan@uoguelph.ca

# Appendix II. AQUASTATS Questionnaire (Long Format)

AQUACULTURE CENTRE  
University of Guelph



## ONTARIO AQUACULTURE SURVEY January 1st to December 31st, 2010

1. YEAR BUSINESS STARTED: ..... ID Number 572.....
2. FEE-FISHING PRESERVE - exclusively: Yes [ ] No [ ]
3. EMPLOYMENT: 2010 (2011)
- a. Full-time ..... person-year(s)
- b. Part-time ..... person-year(s)
4. SPECIES RAISED:
1. Rainbow trout [ ] 3. Arctic charr [ ] 5. Cyprinid bait-fish [ ]
2. Brook trout [ ] 4. Tilapia [ ] 6. Other .....

### 2010 PRODUCTION and SALES of RAINBOW TROUT ONLY

- |                                   | Number Sold | Selling Price (\$/1000) | Total Sales |
|-----------------------------------|-------------|-------------------------|-------------|
| 5. EGGS SOLD                      | .....       | .....                   | \$ .....    |
| 6. FRY, UNDER 2 inches SOLD       | .....       | .....                   | \$ .....    |
| 7. FINGERLINGS, 2 - 6 inches SOLD | .....       | Not applicable          | \$ .....    |
- 
- | 8. MARKET FISH PRODUCTION     | 2010  | (2011) | lbs | kg  | No. |
|-------------------------------|-------|--------|-----|-----|-----|
| 8.1 10 - 16 oz (live weight)  | ..... | .....  | [ ] | [ ] | [ ] |
| 8.2 1 - 2½ lbs (live weight)  | ..... | .....  | [ ] | [ ] | [ ] |
| 8.3 Over 2½ lbs (live weight) | ..... | .....  | [ ] | [ ] | [ ] |
- 
- | 9. MARKET FISH VALUE          | Selling Price |       |       | \$/lb | \$/kg | Total Sales |
|-------------------------------|---------------|-------|-------|-------|-------|-------------|
|                               | Ave.          | Min.  | Max.  |       |       |             |
| 9.1 10 - 16 oz (live weight)  | .....         | ..... | ..... | [ ]   | [ ]   | \$ .....    |
| 9.2 1 - 2½ lbs (live weight)  | .....         | ..... | ..... | [ ]   | [ ]   | \$ .....    |
| 9.3 Over 2½ lbs (live weight) | .....         | ..... | ..... | [ ]   | [ ]   | \$ .....    |
- 
10. SUMMARY OF PRODUCTION AND SALES - do NOT include sales of eggs, fry and fingerlings
- |      |  |          |     |    |     |     |
|------|--|----------|-----|----|-----|-----|
| 10.1 | Total Weight of 'Market Fish' Rainbow Trout Sold | .....    | lbs | kg | [ ] | [ ] |
| 10.2 | Total Value of 'Market Fish' Rainbow Trout Sold  | \$ ..... |     |    |     |     |

*The Aquaculture Centre is partly funded by the Ontario Ministry of Agriculture, Food and Rural Affairs*

ONLY COMPLETE QUESTIONS 11 TO 16 IF PRODUCING FISH OTHER THAN RAINBOWTROUT

**2010 PRODUCTION and SALES of OTHER SPECIES**

SPECIES: .....

	Number Sold	Selling Price \$/ 1000	Total Sales	
11. EGGS SOLD	.....	.....	.....	\$ .....
12. FRY, UNDER 2 INCHES SOLD	.....	.....	.....	\$ .....
13. FINGERLINGS, 2 - 6 INCHES SOLD	.....	.....	Not applicable	\$ .....

14. MARKET FISH PRODUCTION	2010	(2011)	lbs	kg	No.
14.1 10 - 16 oz (live weight)	.....	.....	[ ]	[ ]	[ ]
14.2 1 - 2½ lbs (live weight)	.....	.....	[ ]	[ ]	[ ]
14.3 Over 2½ lbs (live weight)	.....	.....	[ ]	[ ]	[ ]

15. MARKET FISH VALUE	Selling Price			\$/lb	\$/kg	Total Sales
	Ave.	Min.	Max.			
15.1 10 - 16 oz (live weight)	.....	.....	.....	[ ]	[ ]	\$ .....
15.2 1 - 2½ lbs (live weight)	.....	.....	.....	[ ]	[ ]	\$ .....
15.3 Over 2½ lbs (live weight)	.....	.....	.....	[ ]	[ ]	\$ .....

16. SUMMARY OF PRODUCTION AND SALES - do NOT include sales of eggs, fry and fingerlings

16.1 Total Weight of 'Market Fish' Sold	lbs	kg	[ ]	[ ]
16.2 Total Value of 'Market Fish' Sold	\$ .....			

COMMENTS:

.....  
 .....

**"I authorize and consent to the disclosure and use of the information below to the University of Guelph, Aquaculture Centre only for the purpose of general analysis on an aggregate basis as long as individual confidentiality is maintained."**

Signature ..... Date .....

# ONTARIO AQUACULTURE SURVEY

**Covering the Period:  
January 1st to December 31st, 2010**

## Guidelines to Questions

Question:

1. **YEAR BUSINESS STARTED:** Refers to the year of first fish sales.
2. **FEE-FISHING PRESERVE - exclusively:** Please indicate if your business is exclusively that of Fee-fishing.
3. **EMPLOYMENT:** Full-time is defined as a person working 40 and over hours per week for 12 months of the year. Part-time includes all other work schedules.  
Eg. owner and one assistant employed full-time throughout the year is reported as FULL-TIME = 2 person-years, and two seasonal assistants employed March - November (9 months) is reported as PART-TIME = 1.5 person-years (2 persons x 9 months = 18 person-months, divided by 12 = 1.5 person-years).
4. **SPECIES RAISED:** Please indicate the **current** species raised.

### 2010 PRODUCTION and SALES of RAINBOW TROUT ONLY

Please report ONLY the production and sale of RAINBOW TROUT in questions 5 through 10.

- 5 - 7. **EGGS, FRY AND FINGERLINGS SOLD:** Please report those fish **sold to other farms** for stocking, growing-out etc.
8. **MARKET FISH PRODUCTION:** Please report **all** fish sold:- e.g. for processing, wholesale, restaurant, farm-gate, pond-stocking and fee-fishing etc.  
Report production in terms of LIVE WEIGHT.
9. **MARKET FISH VALUE:** Please report the selling price obtained over the calendar year.
10. **SUMMARY OF PRODUCTION AND SALES:** Please do NOT include sales of eggs, fry and fingerlings.

### 2010 PRODUCTION and SALES of OTHER SPECIES

- 11 - 16. For farmers raising species **other than** or in addition to **rainbow trout**, we would request that you complete questions 11 through 16 in a similar manner to the above.

Please state the species of fish produced.

Additional copies of the questionnaire are available for farms raising more than two species of fish. Please call us at (519) 824-4120 ext. 52689 for a copy.

*Please mail this form in the enclosed self addressed envelope  
or Fax to (519) 669-5412*

# Appendix III. AQUASTATS Questionnaire (Short Format)

## AQUACULTURE CENTRE

University of Guelph

Guelph, Ontario N1G 2W1

Tel: (519) 824-4120 Ext 52689

Fax: 519-837-8867

### Ontario Aquaculture Survey: 2010

NAME: LAST, First

Company

Address

City

Province

Postal code

#### Farm Statistics

##### 1. Facility Type

- Hatchery
- Stocking
- Food Producer
- Recreational Fee-fishing
- Other

##### 2. Species Raised

- Rainbow trout
- Brook trout
- Arctic charr
- Bass
- Other

##### 3. Employment

- |               | Full-time                           | Part-time                |
|---------------|-------------------------------------|--------------------------|
| Zero          | <input type="checkbox"/>            | <input type="checkbox"/> |
| Less than 1   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 1.0 to 3.0    | <input type="checkbox"/>            | <input type="checkbox"/> |
| More than 3.0 | <input type="checkbox"/>            | <input type="checkbox"/> |
| Actual number | <input type="text"/>                | <input type="text"/>     |

##### 4. Total Production

- Check units Lbs  or No.
- Zero
  - Less than 5,000
  - 5,000 to 25,000
  - More than 25,000
  - Actual production (optional)

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

"I authorize and consent to the disclosure and use of the above information to the University of Guelph, Aquaculture Centre only for the purpose of general analysis on an aggregate basis as long as individual confidentiality is maintained."

Signature \_\_\_\_\_

Date \_\_\_\_\_

# ONTARIO AQUACULTURE SURVEY

Covering the Period:  
January 1<sup>st</sup> to December 31<sup>st</sup>, 2010

## Guidelines to Questions

Question:

1. **FACILITY TYPE:**

Please tick **all** relevant boxes.

2. **SPECIES RAISED:**

Please tick **all** relevant boxes.

3. **EMPLOYMENT:**

Full-time is defined as a person working 40 and over hours per week for 12 months of the year. Part-time includes all other work schedules.

e.g. owner and one assistant employed full-time throughout the year is reported as:  
FULL-TIME = 2 person-years, and

two seasonal assistants employed March - November (9 months) is reported as:  
PART-TIME = 1.5 person-years  
(2 persons x 9 months = 18 person-months, divided by 12 = 1.5 person-years).

4. **TOTAL PRODUCTION:**

Please report **all** fish sold:- e.g. for processing, wholesale, restaurant, farm-gate, pond-stocking and fee-fishing etc.  
Report production in terms of either live **weight** or **numbers** of fish.

If you have any questions, please call us at (519) 824-4120 ext. 52689.

*Please mail the form in the enclosed self addressed envelope before 14<sup>th</sup> Feb. 2011*

*Thank you*