



Has the LPA system been successful?

Small-scale marine aquaculture recruitment in Maine
through the limited-purpose aquaculture
("LPA") licensing system

(Research Overview, for dissemination)

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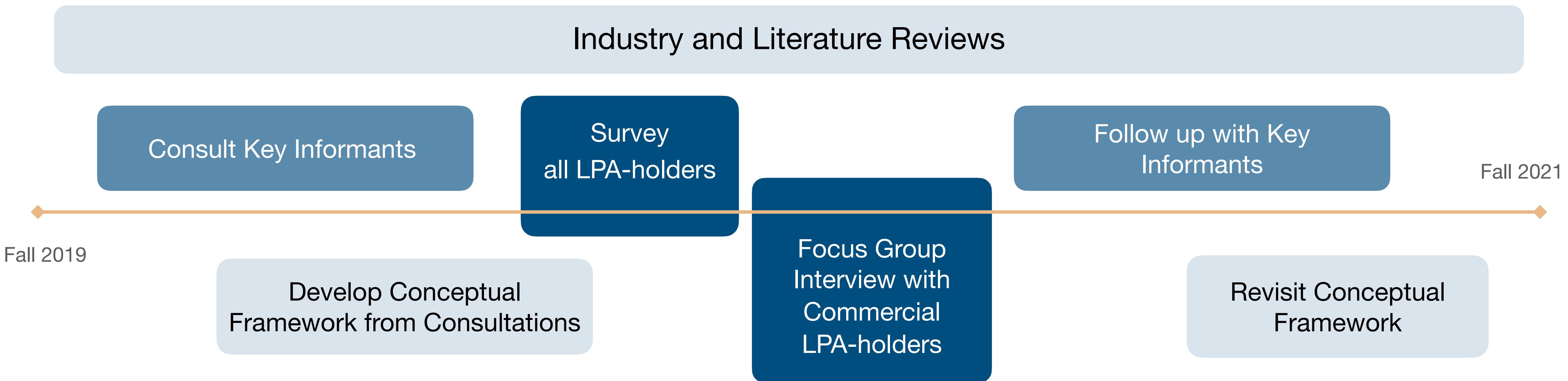
I. Introduction: a Transdisciplinary Research Approach

- Analyze Maine's LPA system as a recruitment mechanism for Maine marine aquaculture
- Collect data on LPA-holders' commercialization and food security
- Respond to key informants' desires for an overview of LPA-holder demography, LPA farm characteristics, and commercialization experiences

Research Questions

- Does Maine's LPA system support sustainable marine aquaculture recruitment in the state?
- Does the LPA system support **small-scale** ocean farmers' commercialization efforts?
- What do LPA-holders' experiences in sustaining their aquaculture farms reveal about aquaculture governance in Maine?

Methodology



Research Themes

OCEAN LEASING

- Public lands, not private
- “Users,” not “owners”

RURAL DEVELOPMENT

- Mostly small-scale
- Food security

RECRUITMENT

- How many join aquaculture?
- How many stay in it?

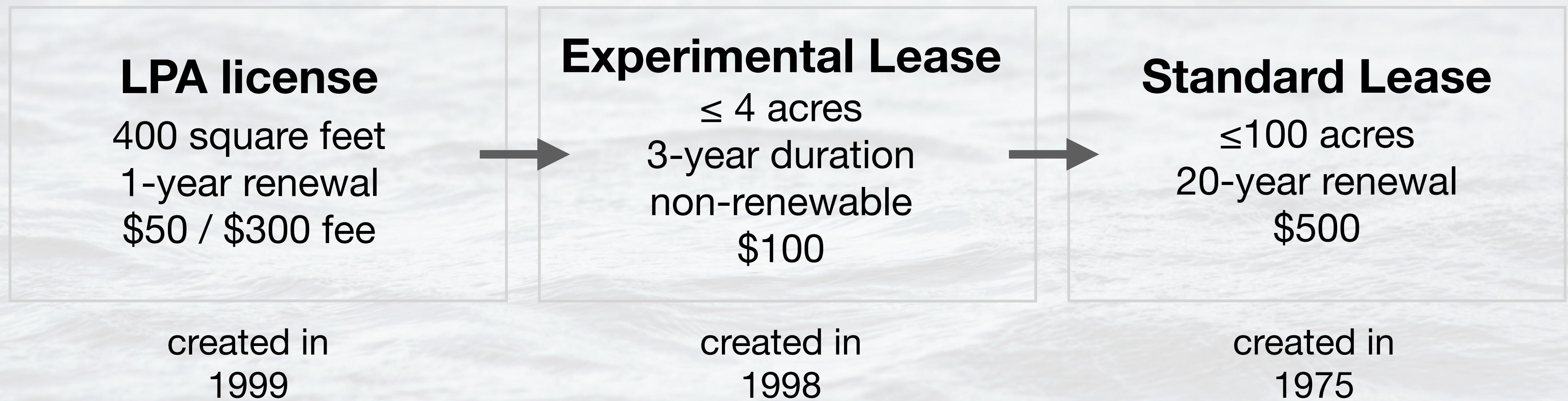
COMMERCIALIZATION

- Selling/wanting to sell products
- Economic sustainability and “scaling up”

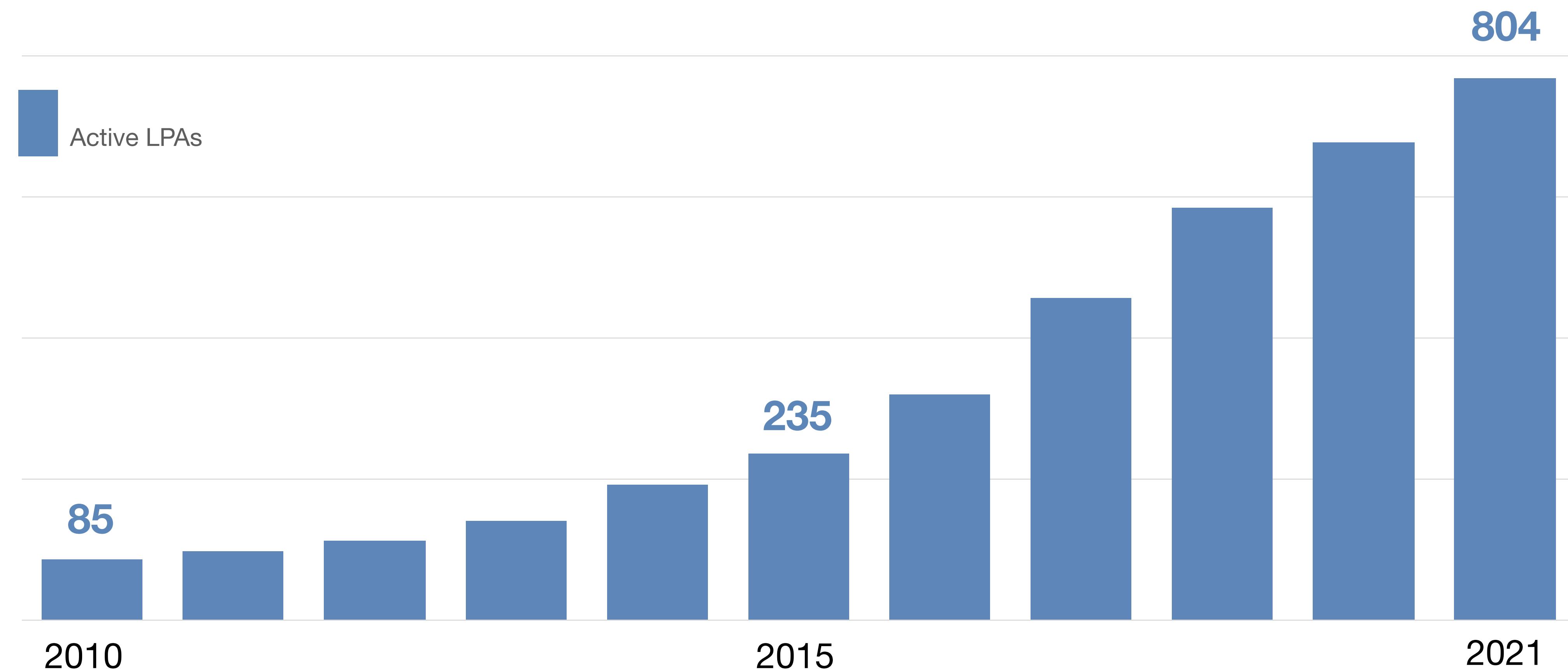
GOVERNANCE

- Rules, norms, and institutions
- Political economy

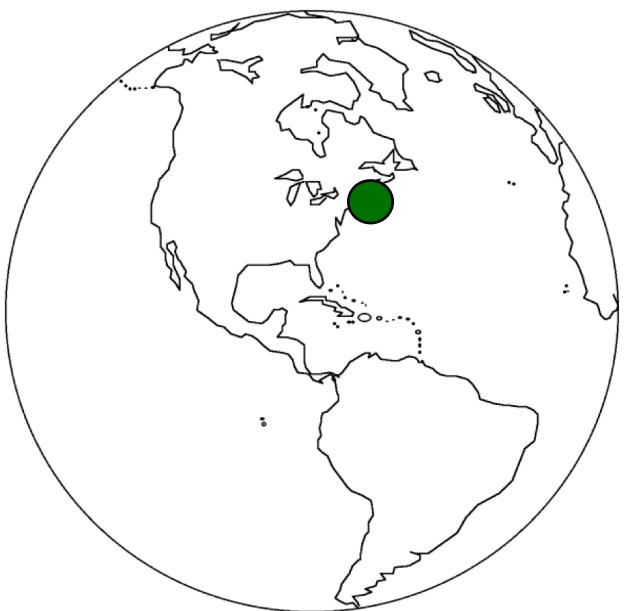
II. Background: Maine's Ocean Leasing/Licensing System



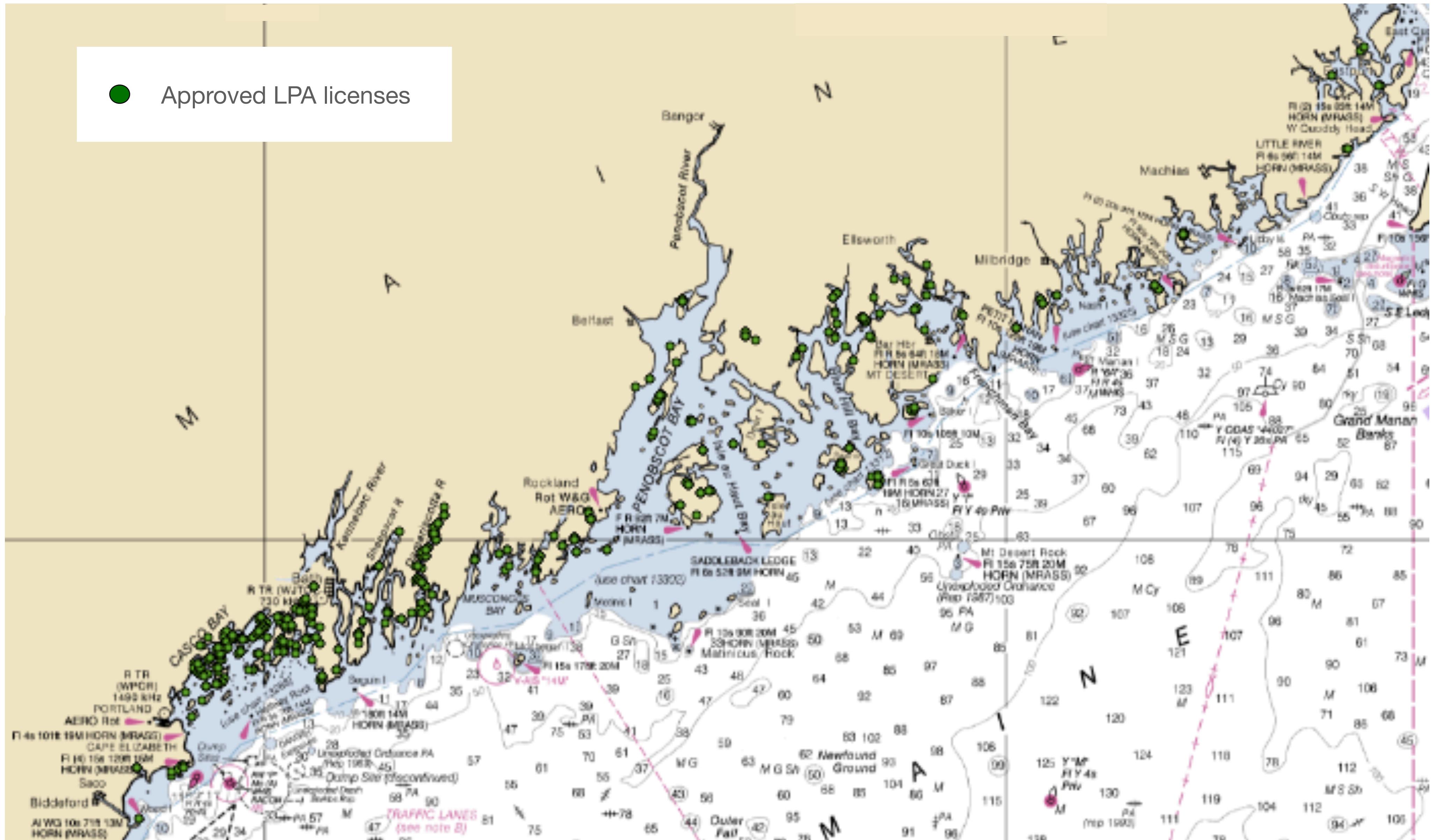
LPAs are increasingly popular



DMR data, 2022

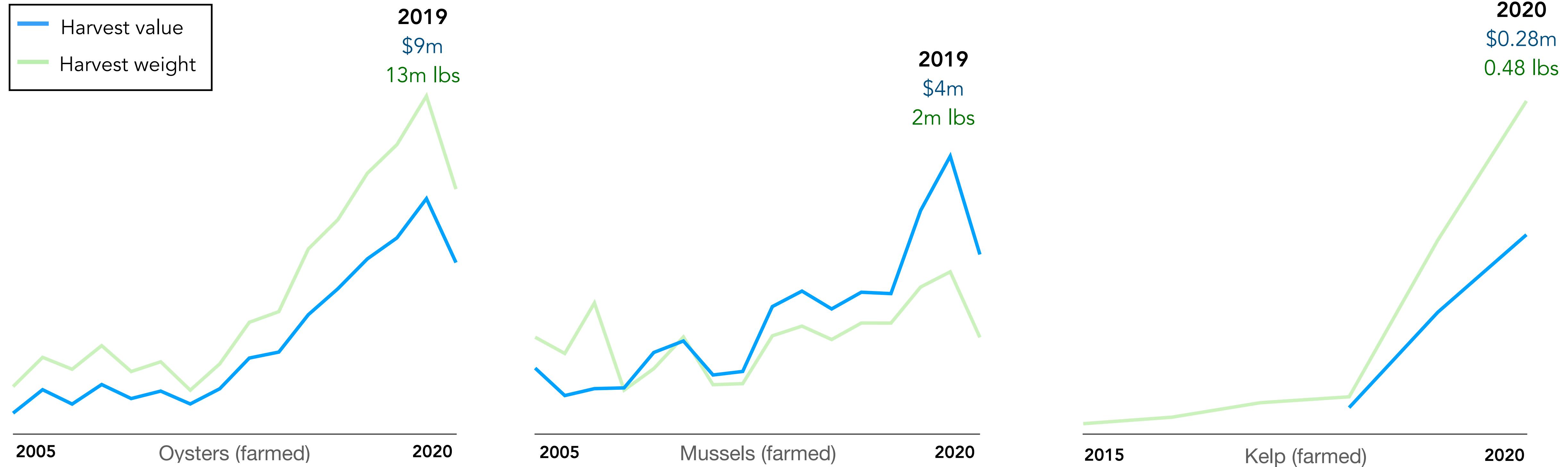


● Approved LPA licenses



DMR data, 2021

Ocean-farmed Species Harvests in Maine



DMR data, 2021

LPAs: an Aquaculture System Unique to Maine

U.S. marine aquaculture leasing outside of Maine

U.S. marine aquaculture leasing outside of Maine	LPAs
Many required, or undeveloped, permits	/ Consolidated application
High acreage minimums	/ Small-scale LTL experimentation
Detailed economic reporting	/ Minimal reporting
Mandated public hearings	/ Narrower public input
Lengthy permit duration	/ 1-year duration
	Access to the rich Gulf of Maine

*“LPAs are for experimentation, allowing entrants to try and possibly fail.
[They are] about lowering barriers to entry, especially for fishing families with fewer resources or equity.”*

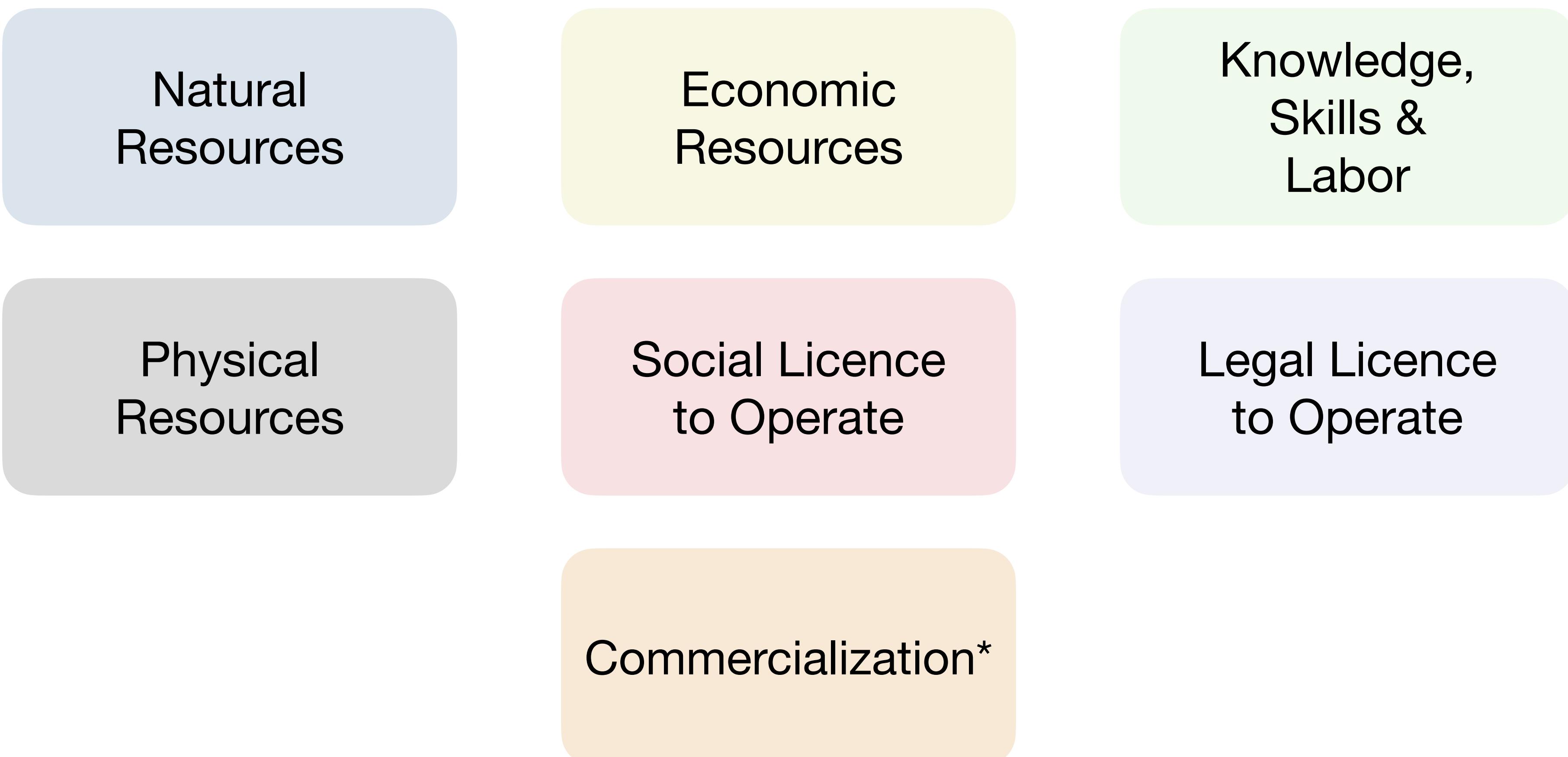
-Maine Aquaculture Association

For Maine aquaculture, lower barriers-to-entry



III. Results: What does success at the LPA level require?

Conceptual Framework



Natural Resources

- Suitable marine habitat
- Appropriate seed/spores

Economic Resources

- LPA-holders' financial resources
- LPA-holders' food security
- Accessibility of seed/spores
- "FLUPSY"

Labor, Knowledge & Skills

- LPA-holders' labor
- LPA-holders' maritime skills
- LPA-holders' farming skills
- LPA assistants
- Aquaculture training programs

- Waterfront and LPA site access
- Farm gear
- Vehicles

Physical Resources

LPA-holders' relationships with:

- Coastal neighbors
- Neighboring fishers
- Recreational-use neighbors
- Fellow LPA-holder neighbors

- Maine DMR
- Army Corps of Engineers
- Harbormasters
- Municipal shellfish committees

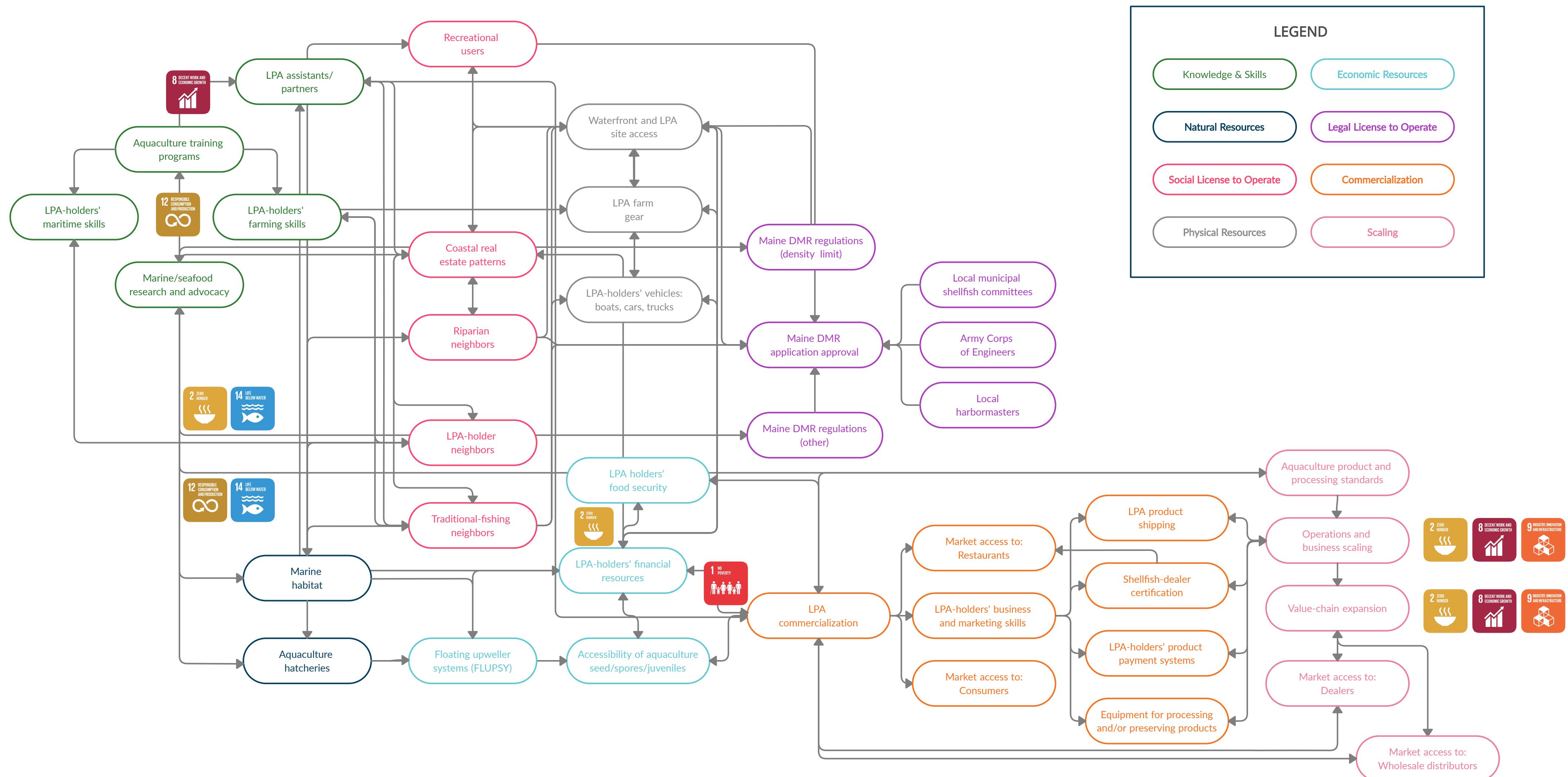
Social Licence to Operate

Legal Licence to Operate

Commercialization*

- Access and sales to various markets
- Business and marketing skills
- Equipment: preserving, processing, packaging, payment, shipping
- Certifications
- Scaling*

Conceptual Map

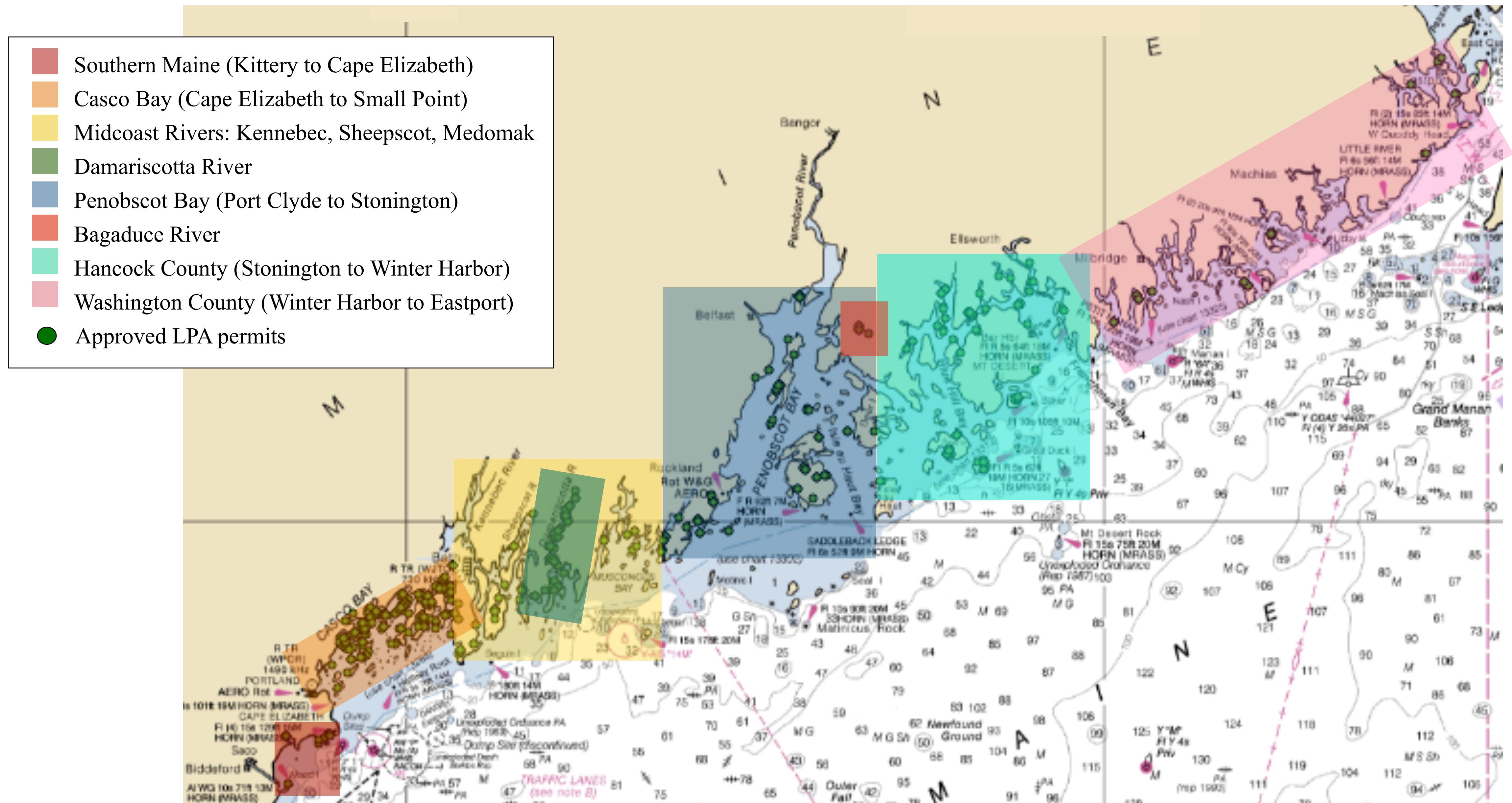


IV. Results: Survey Highlights

- Online, anonymous survey
- Email
- REDCap software

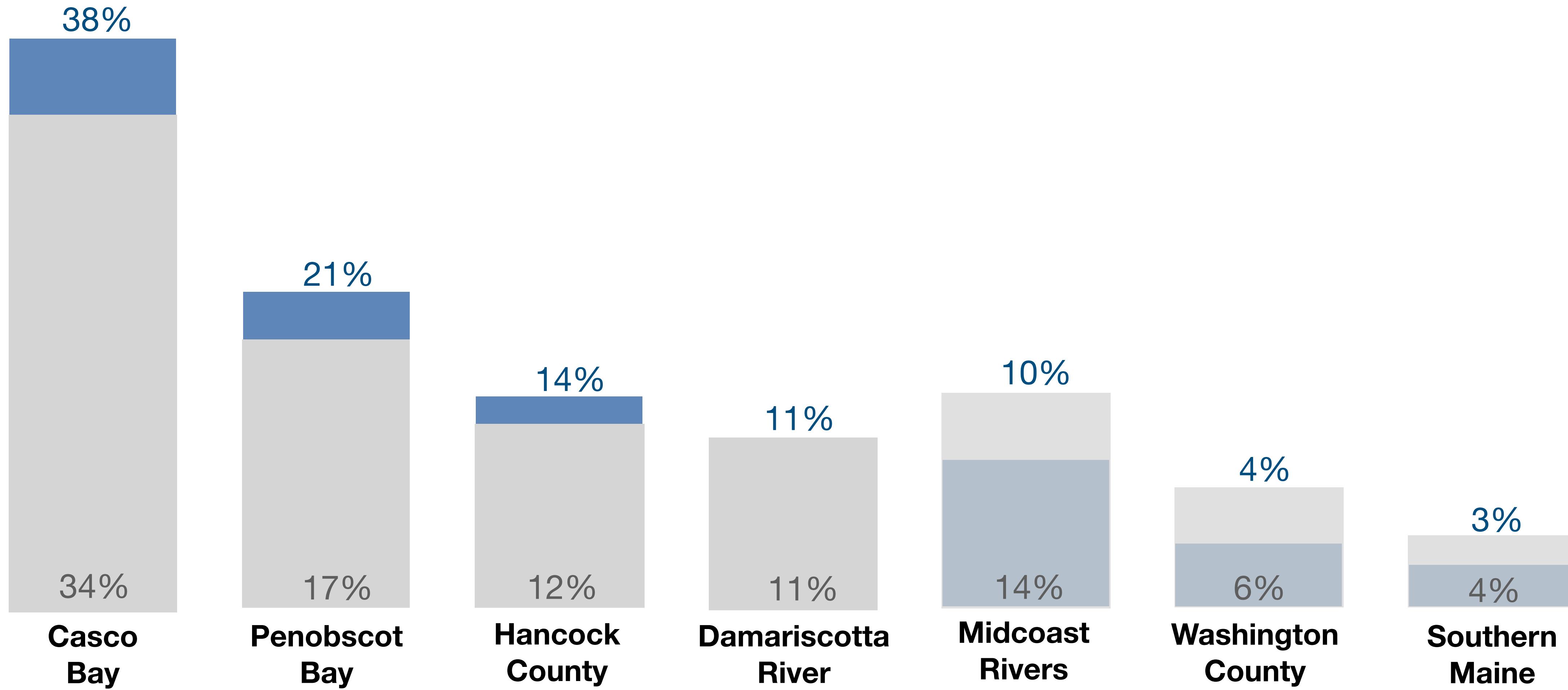
- LPAs in Maine (as of May 5, 2021): 675
 - Individual email addresses/
 - Potential respondents: 250
- Respondents: 74
- Response rate, overall: **28.8%**
Individual survey question response rates varied

Where are Maine's LPAs? Survey Regions



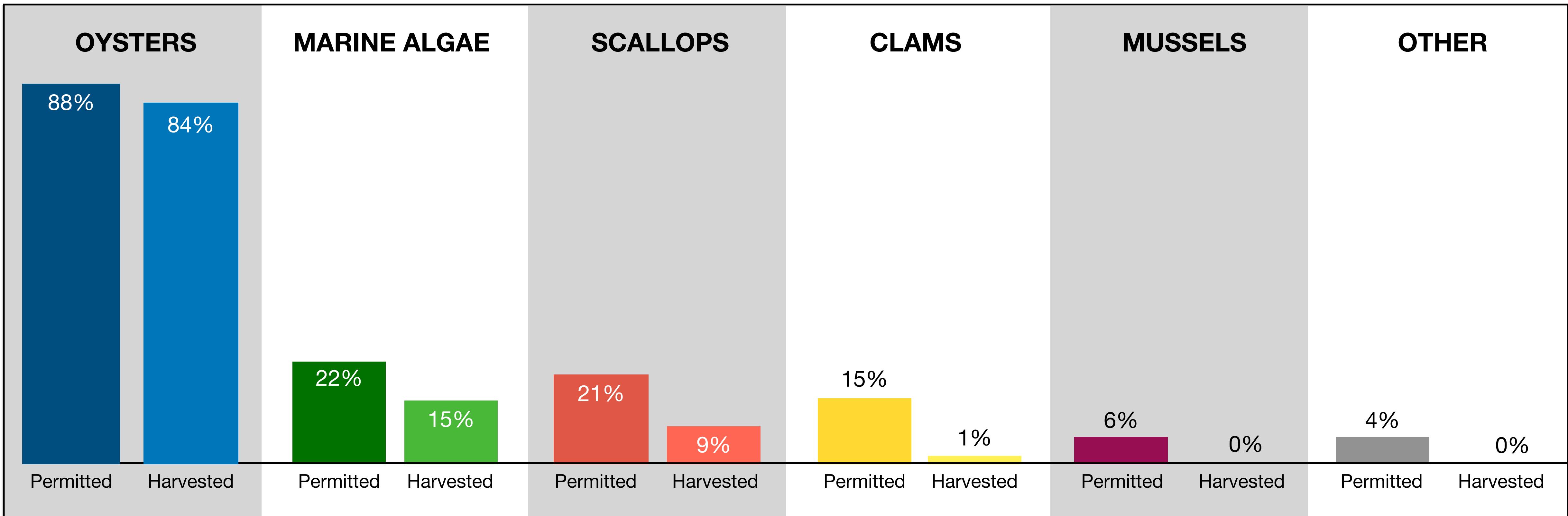
Where are Maine's LPAs? Survey Regions

- “Where is your LPA(s) located? (Check all that apply.)”
- Regions’ LPAs (as proportions of state total)



What are LPA-holders growing?

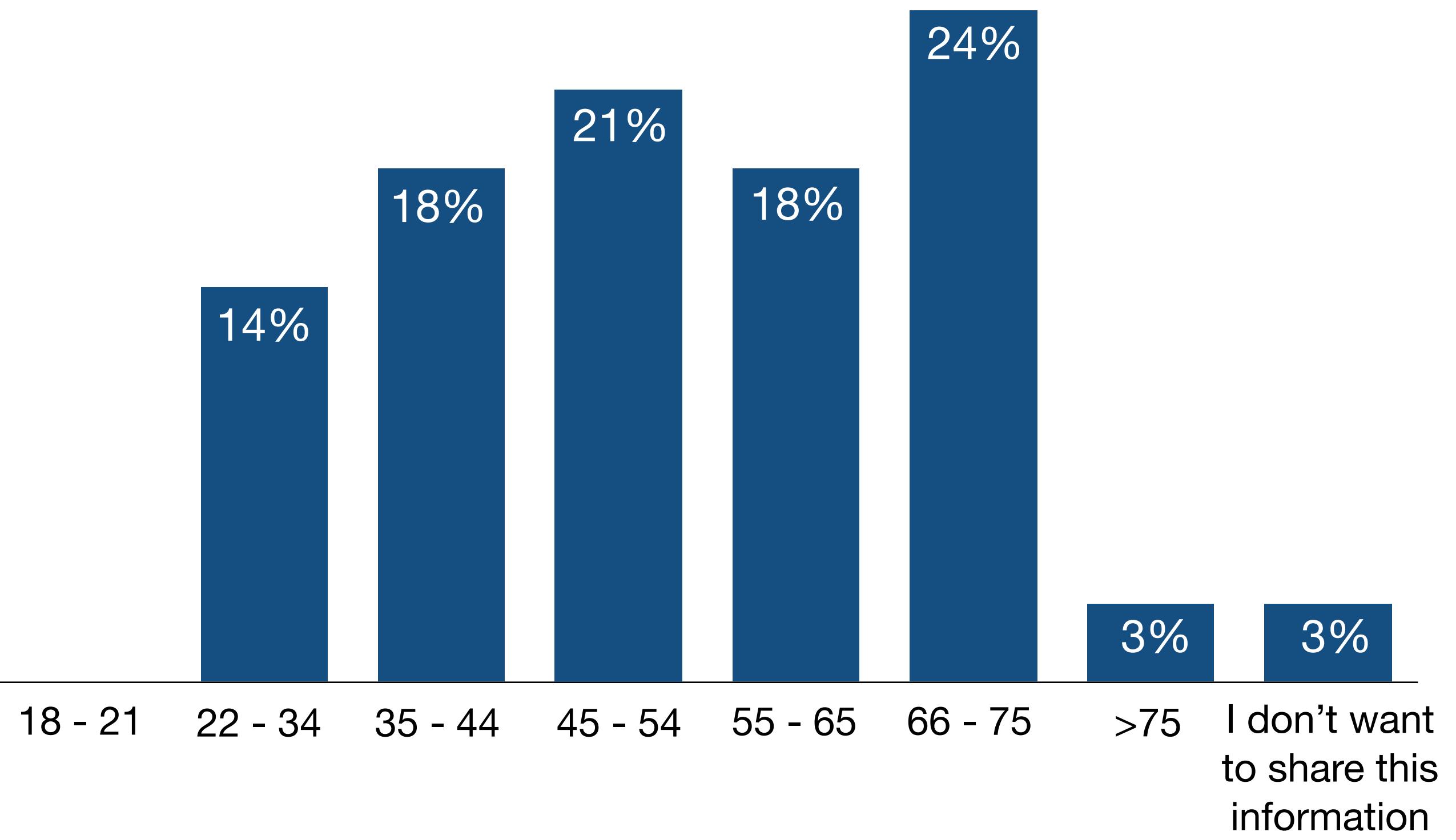
“What are you licensed to grow on your LPA(s)? (Check all that apply.)”



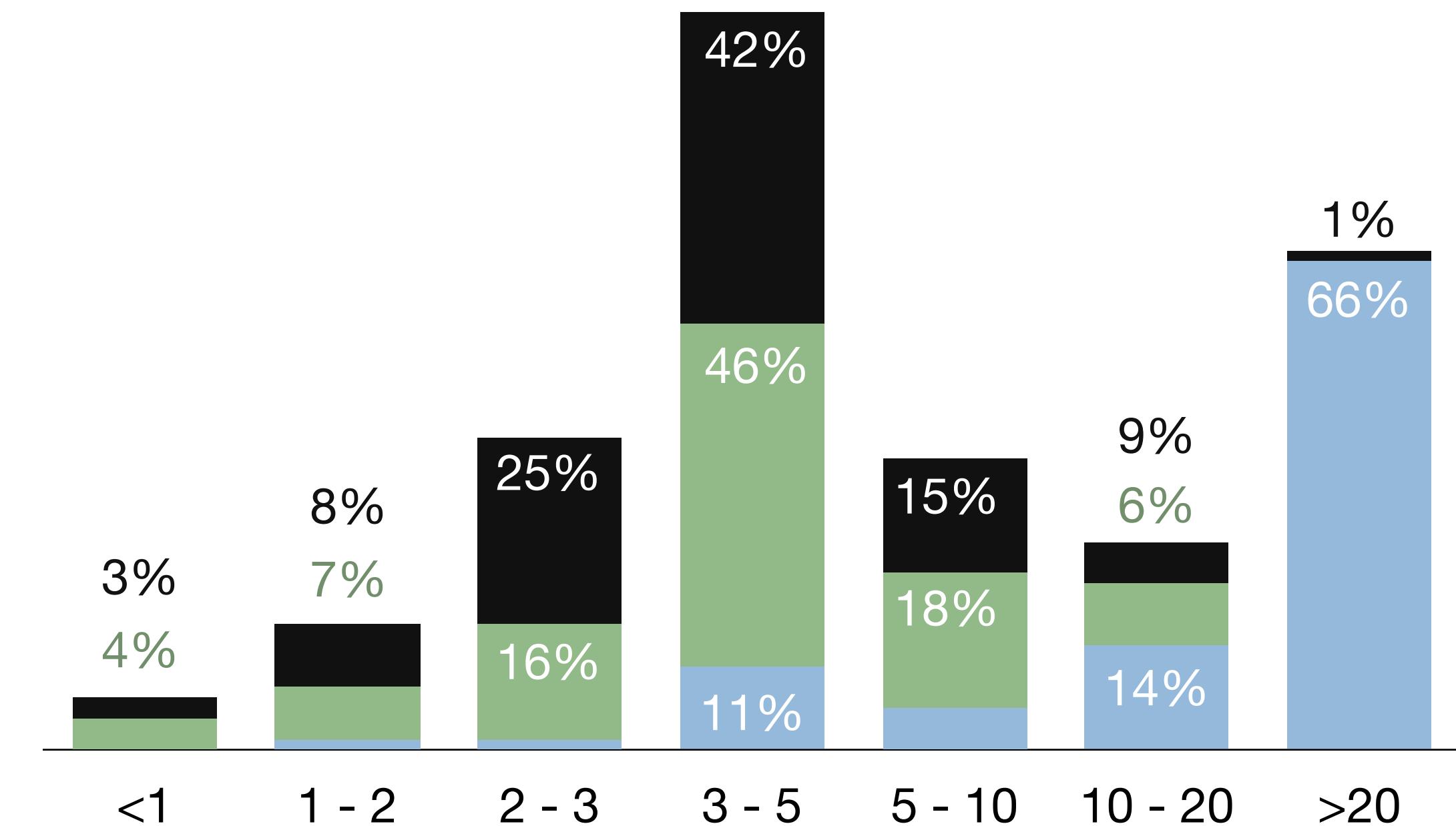
Who are LPA-holders?

RESPONDENT BACKGROUNDS

“What is your age?”



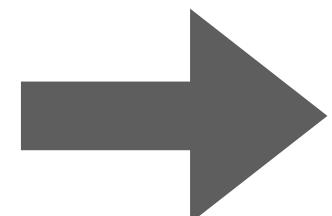
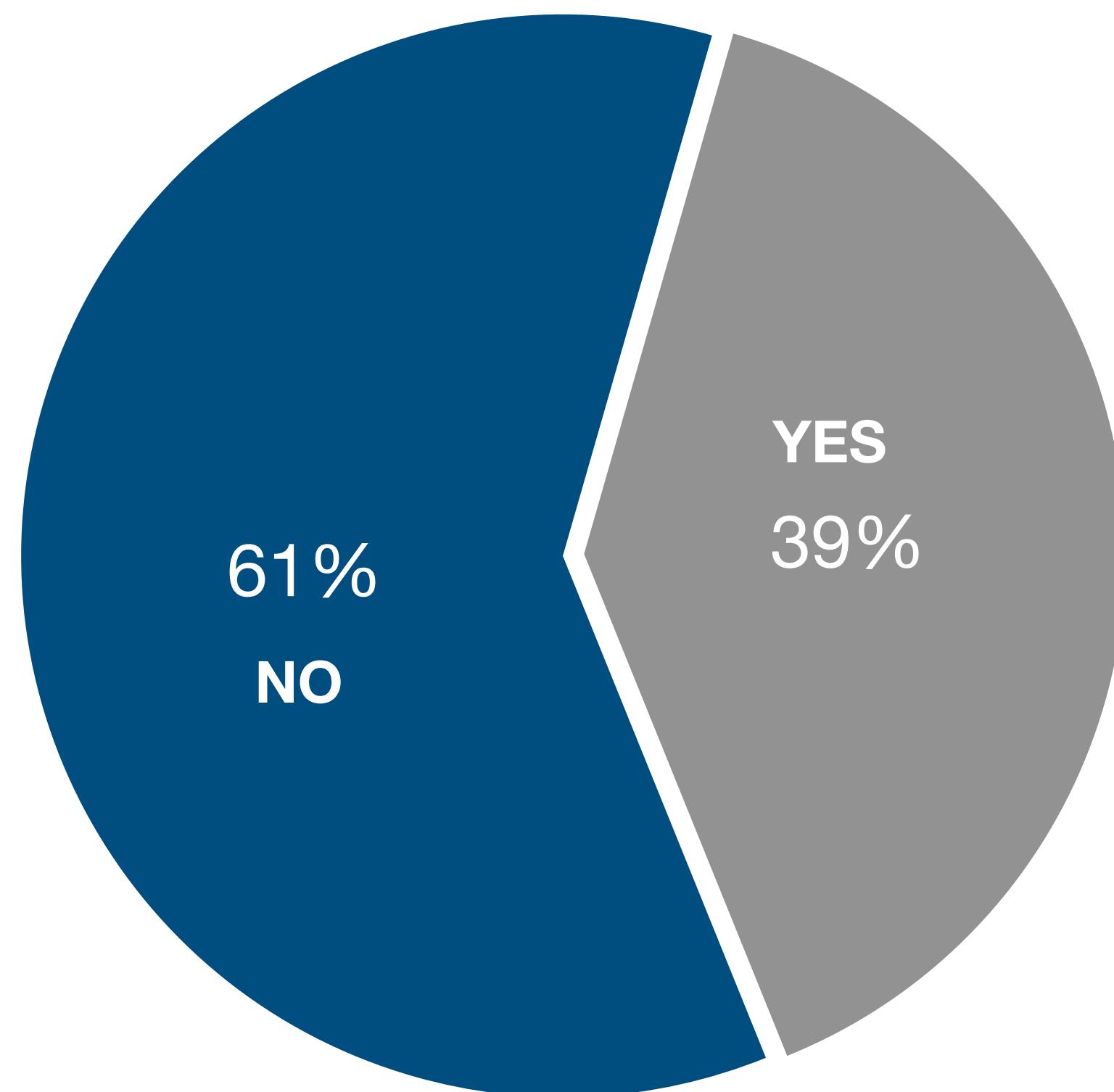
- “For how long have you lived in Maine?”
- “For how many years have you been working in aquaculture?”
- “For how many years have you been farming on your LPA(s)?”



Who are LPA-holders?

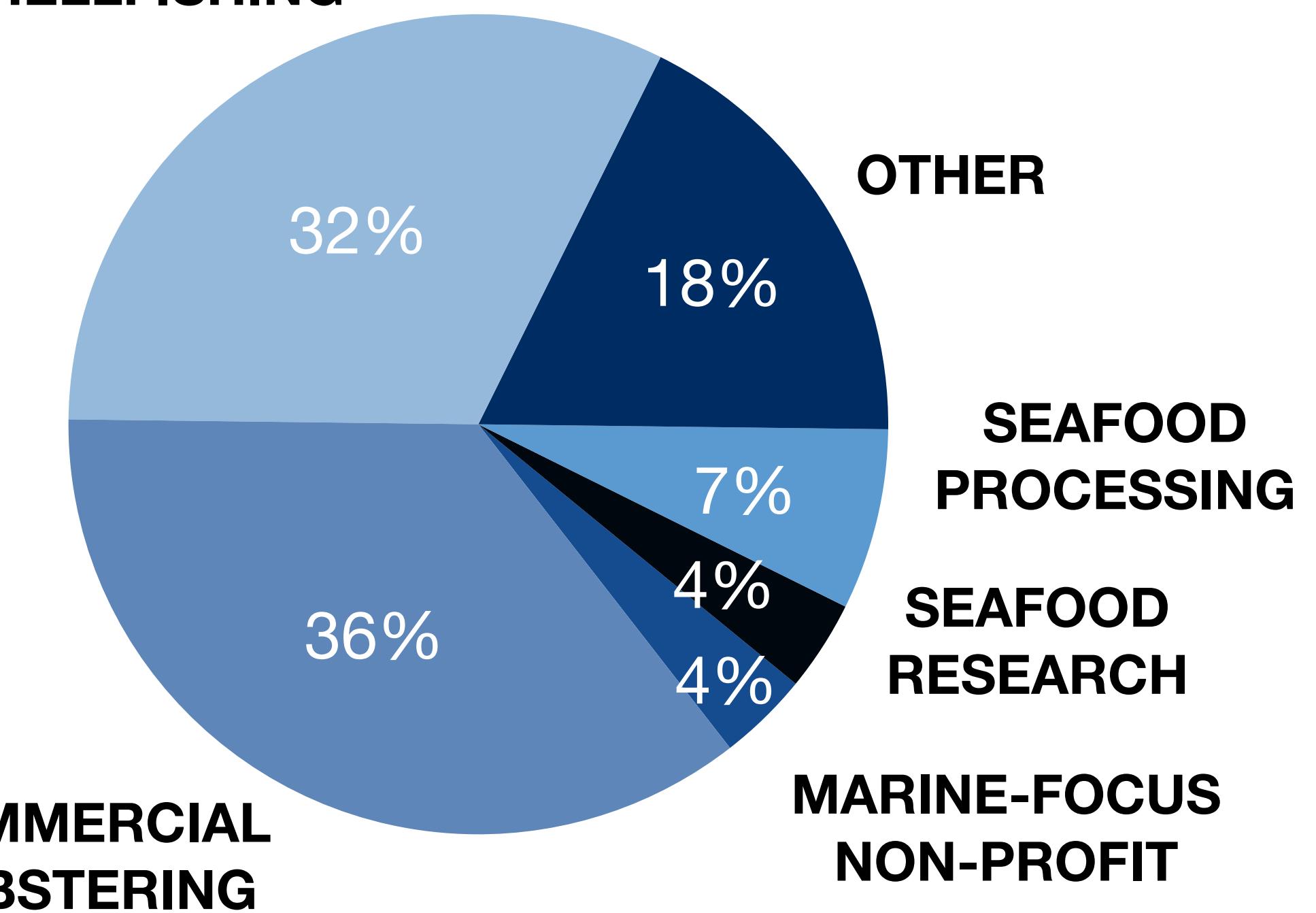
SEAFOOD INDUSTRY EXPERIENCE

“Did you work in the seafood industry before you started working in aquaculture?”



“In what part of the seafood industry did you primarily work before you started working in aquaculture? (Please select only one response.)”

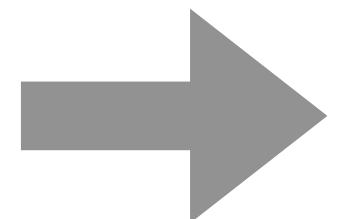
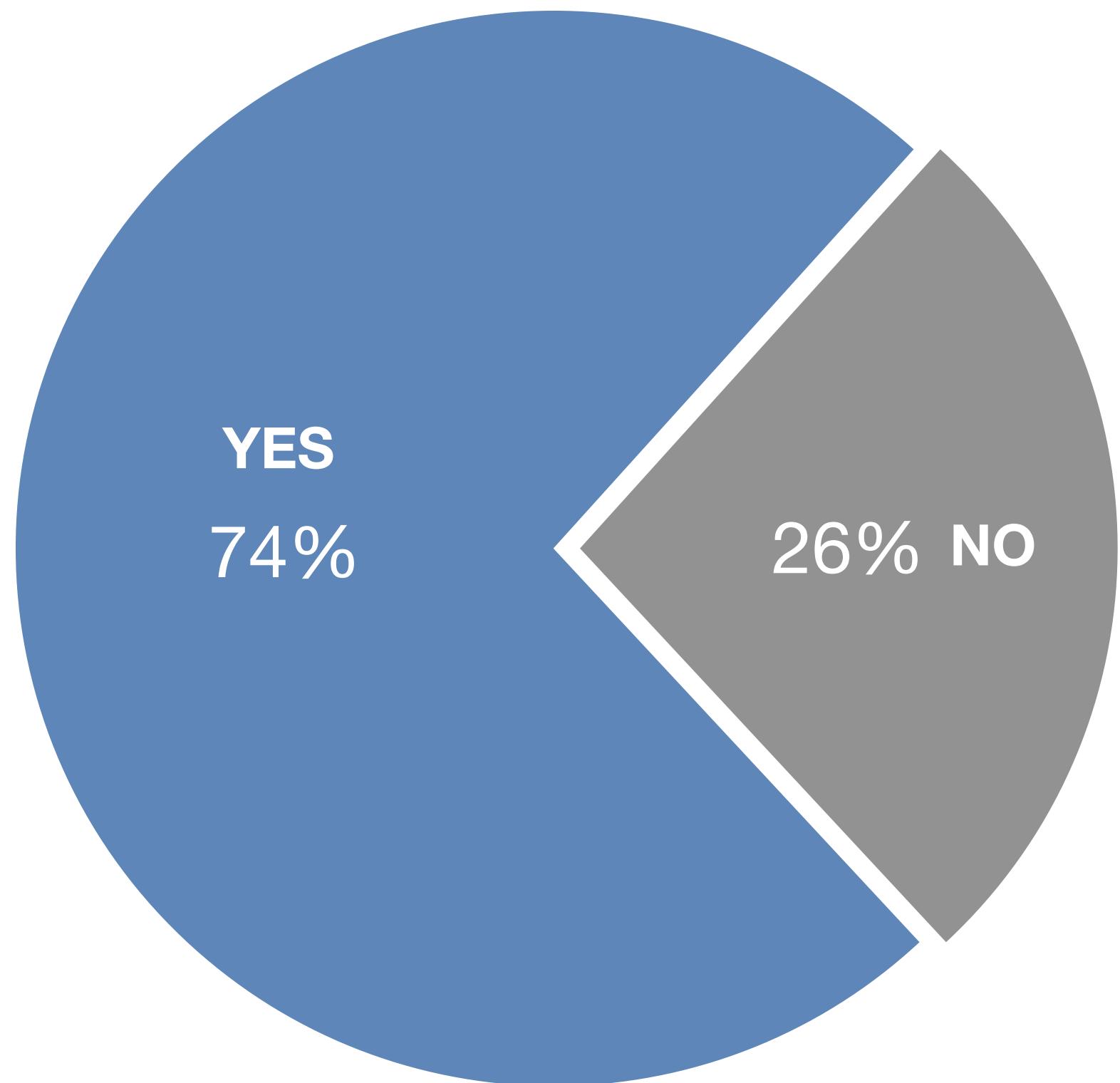
COMMERCIAL SHELLFISHING



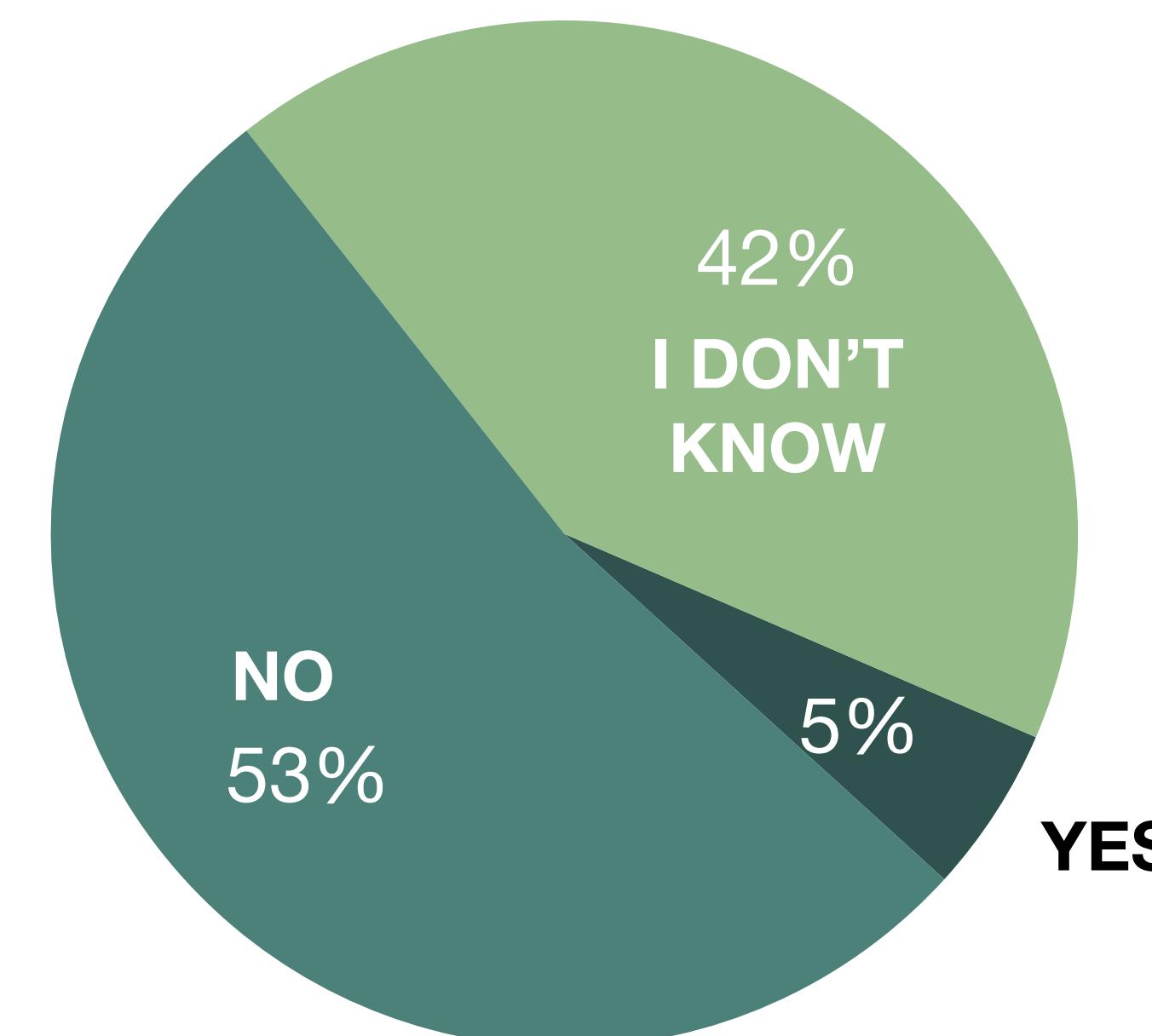
Who are LPA-holders?

TRAINING PROGRAMS

“Have you participated in a formal aquaculture training program?”



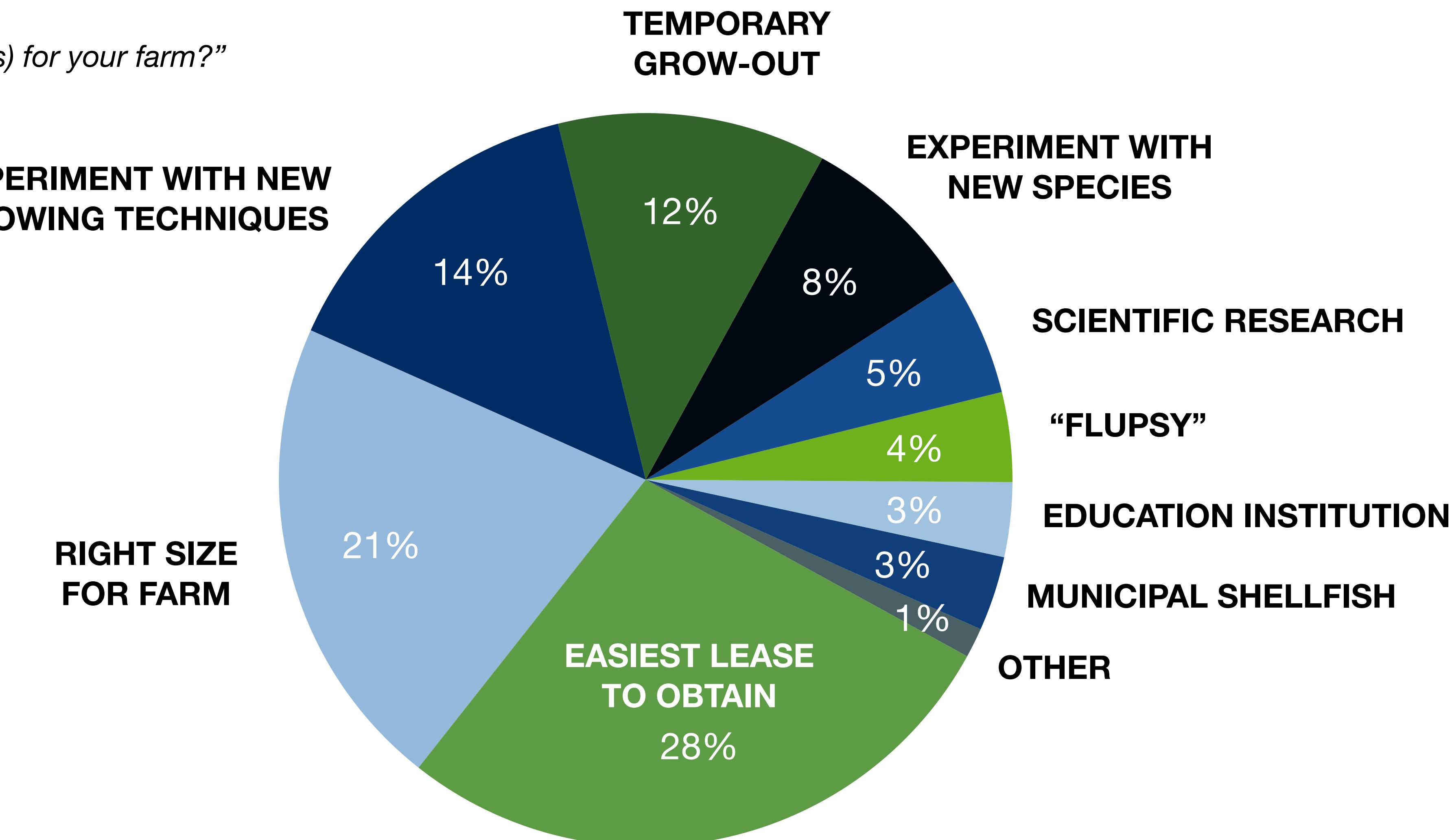
“Do you want to participate in a formal aquaculture training program?”



Why are ocean farmers using LPAs?

CHOOSING LPAs IN PARTICULAR

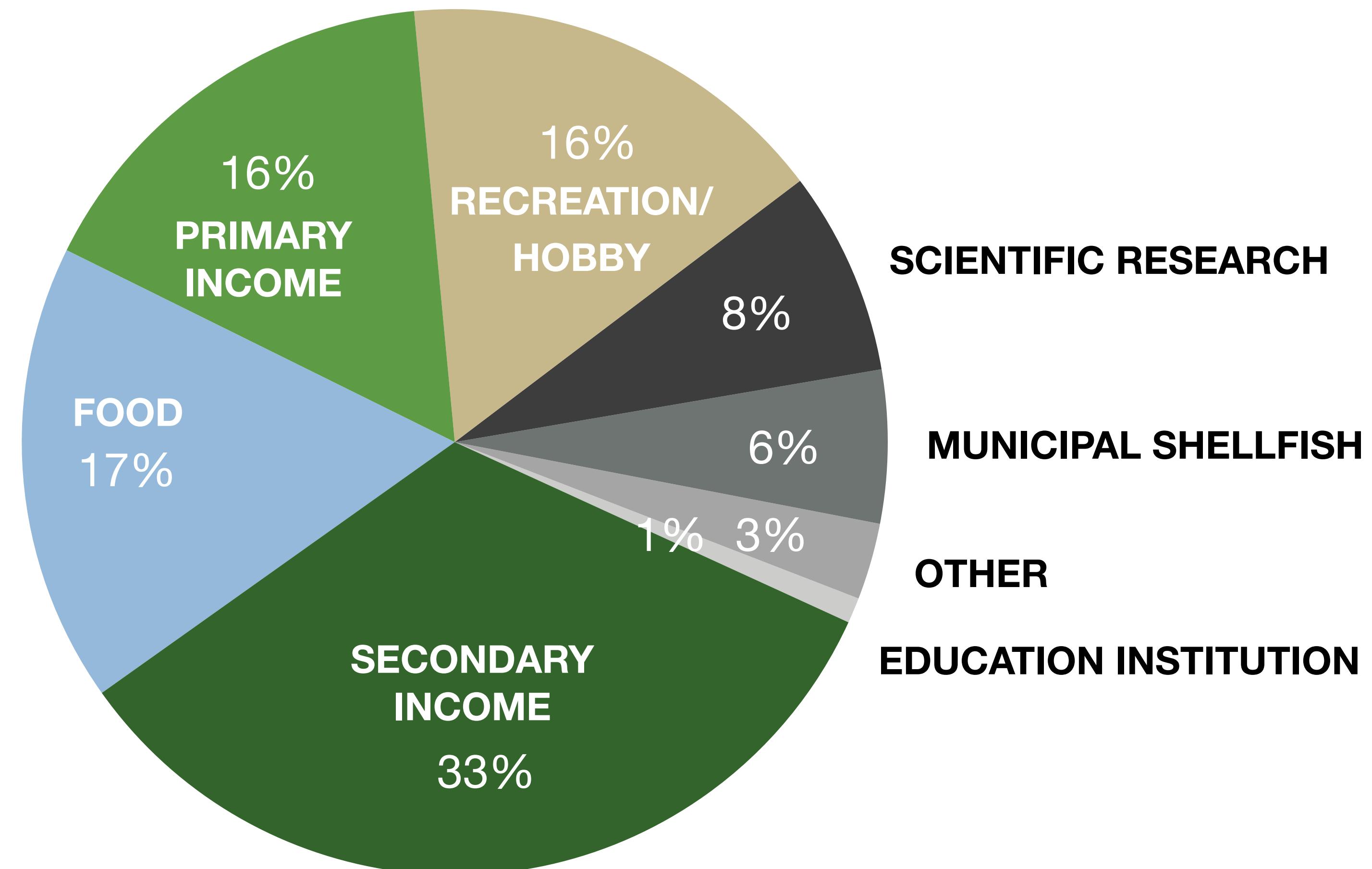
“Why did you choose an LPA(s) for your farm?”



Why are ocean farmers using LPAs?

PRIMARY PURPOSES FOR LPAs

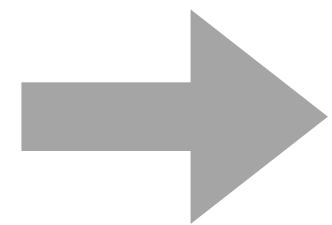
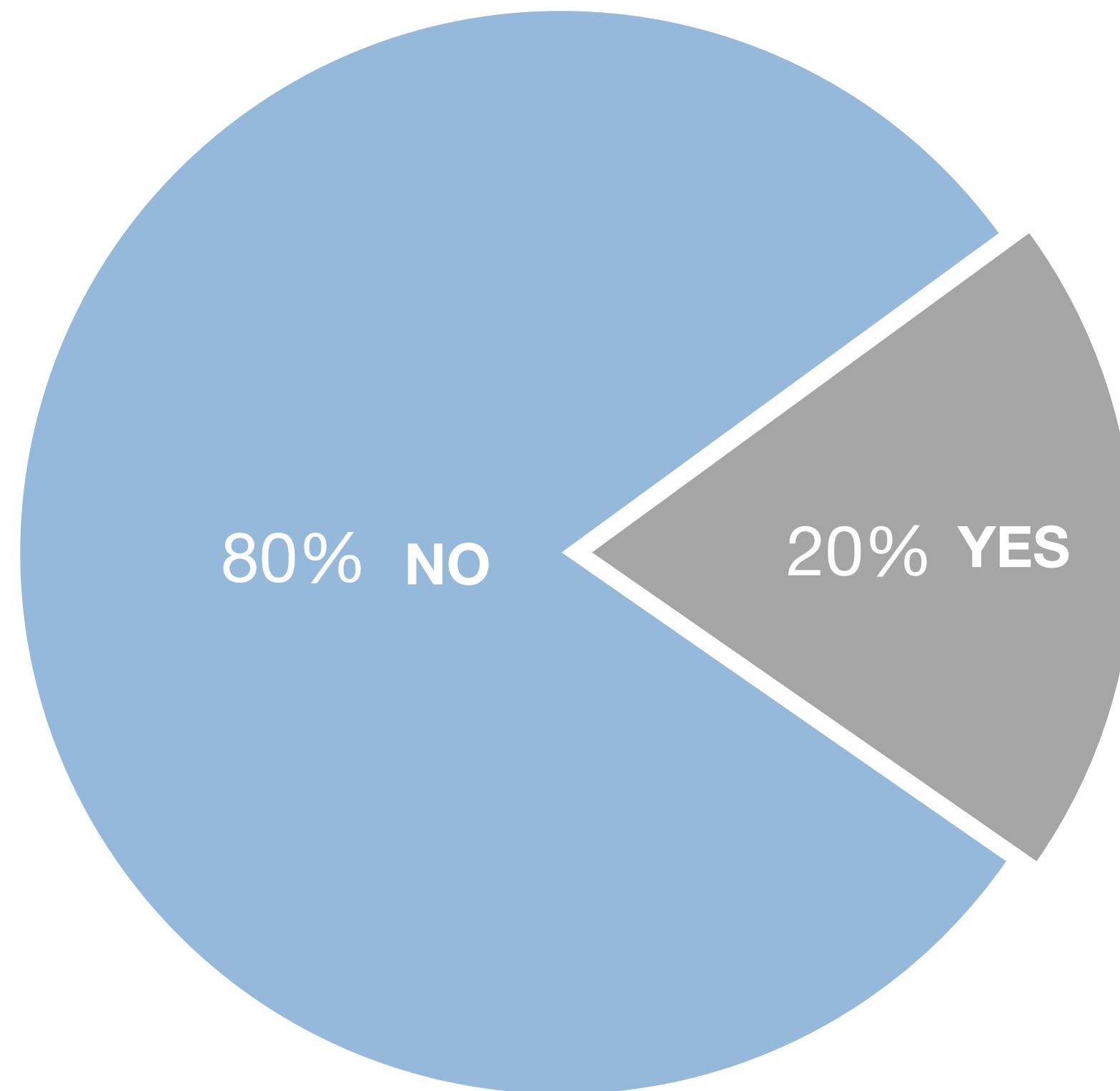
*“What are the main reasons that you have your LPA(s)?
Check 1 or 2 responses.”*



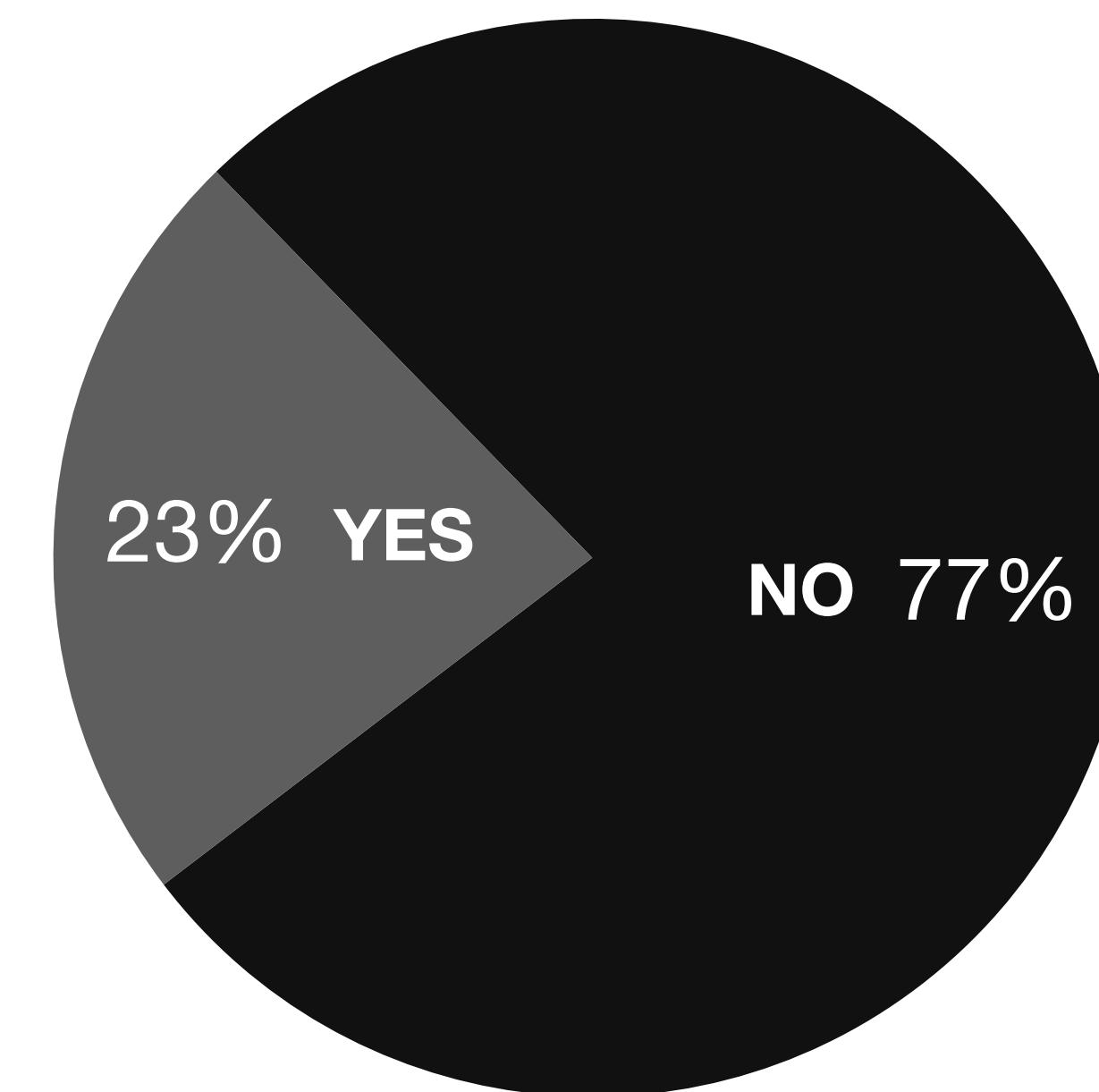
Why are ocean farmers using LPAs?

FOOD SECURITY

“Do you rely on the food product(s) from your LPA(s) for you or your family to eat?”



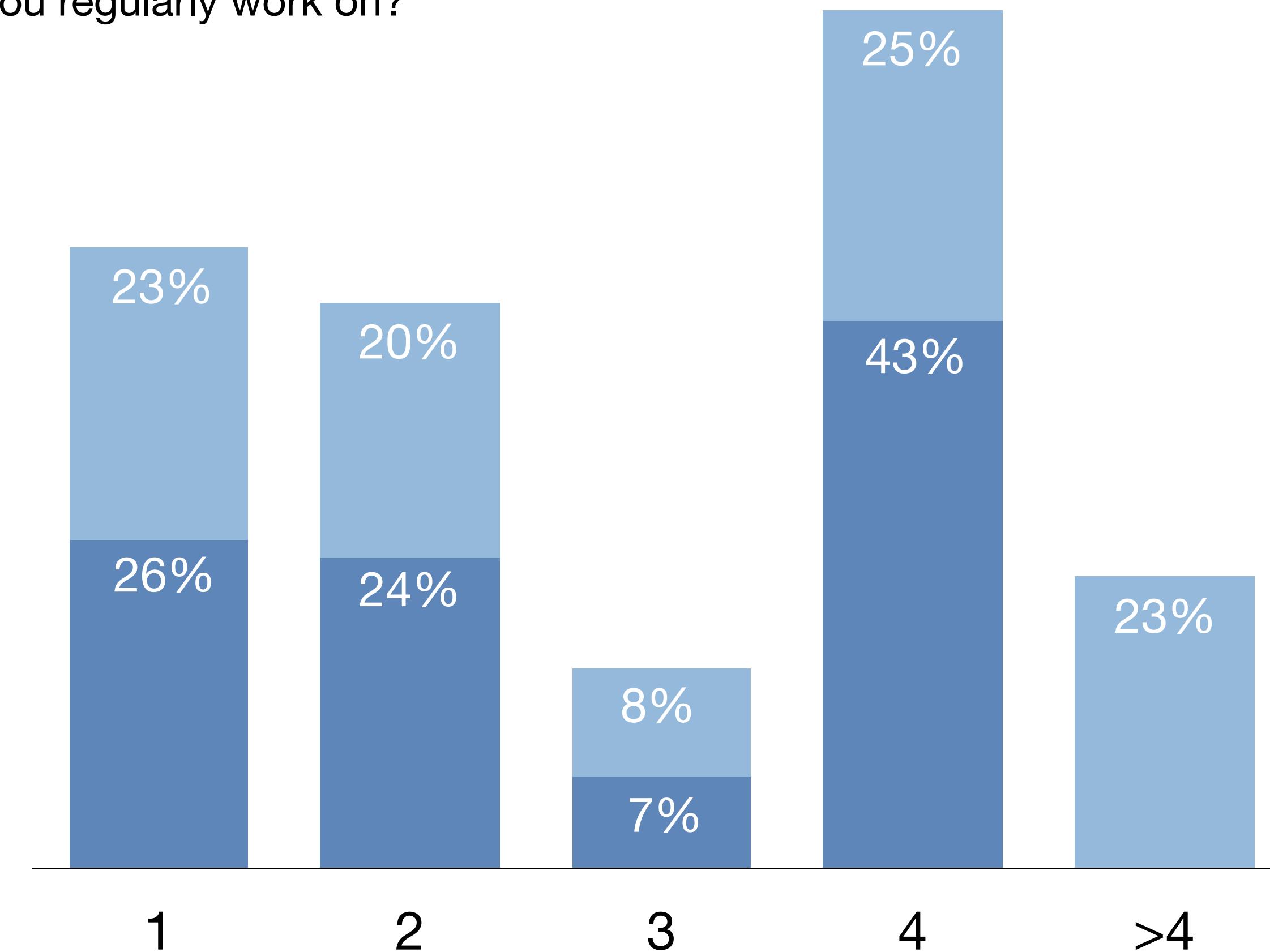
“Would you be worried about how to get food if you suddenly could not eat the product(s) from your LPA(s)?”



How large are LPA farms?

NUMBER OF LPAs PER LPA-HOLDER

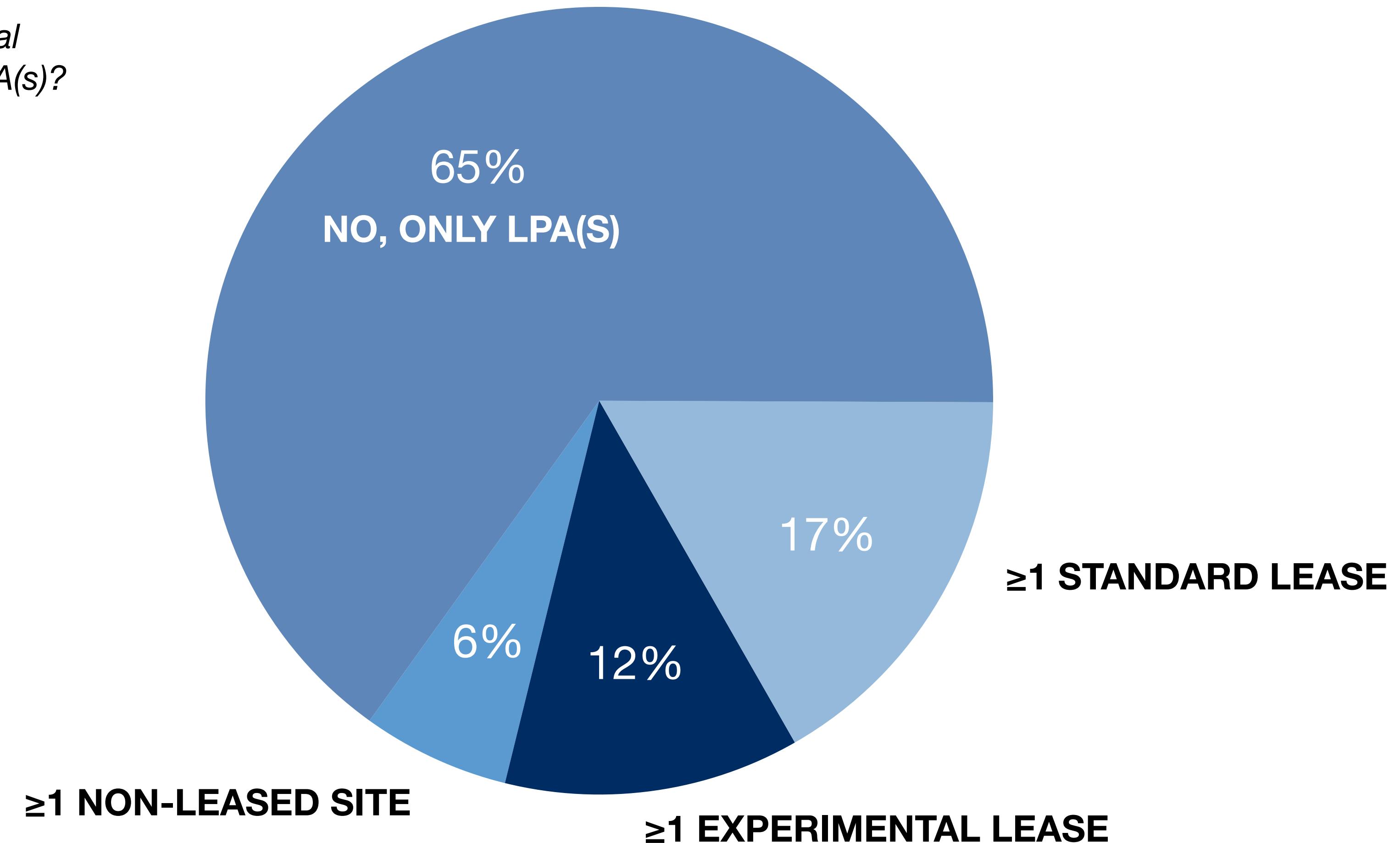
- “How many LPAs are you licensed to operate?”
- “How many LPAs do you regularly work on?”



How large are LPA farms?

DIVERSITY OF LEASES

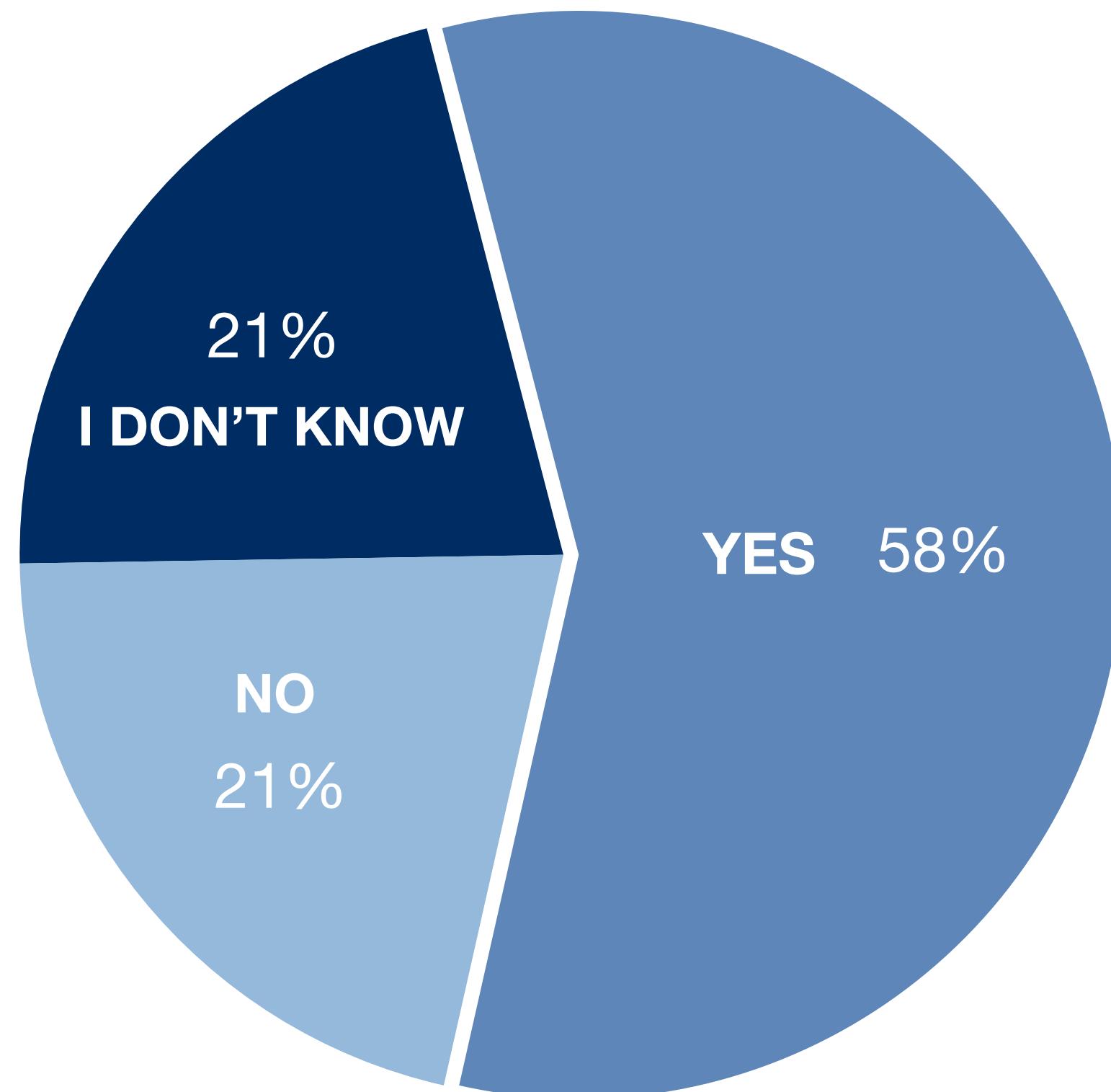
*“Do you regularly work on any additional aquaculture sites besides your own LPA(s)?
(Check all that apply.)”*



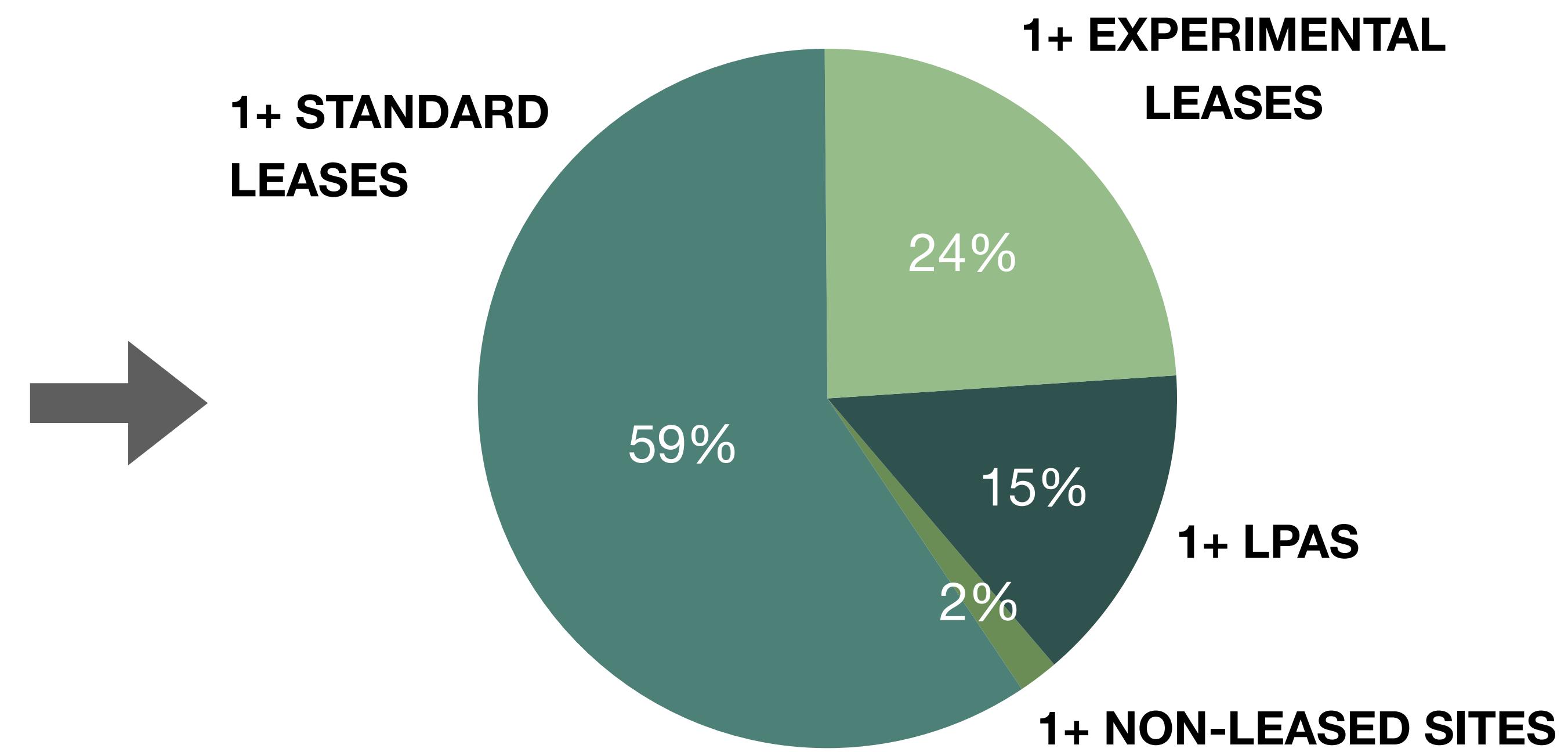
How large are LPA farms?

WHETHER LPA-HOLDERS WANT TO EXPAND THEIR FARMS

“Either now or future, do you want to expand the size of your farm?”



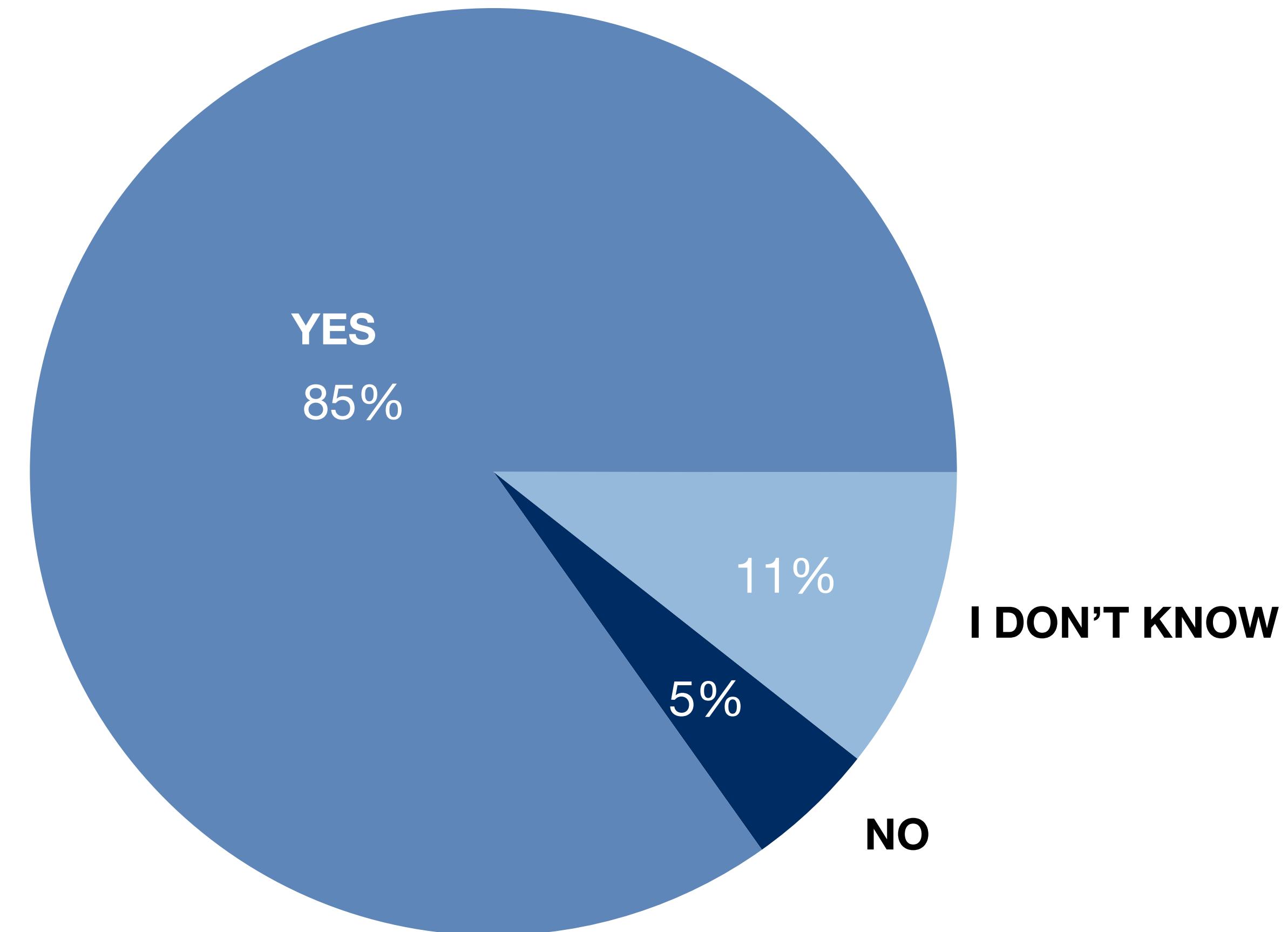
“Do you want to expand your farm through any of the following?”



How large are LPA farms?

INFORMED DECISION-MAKING

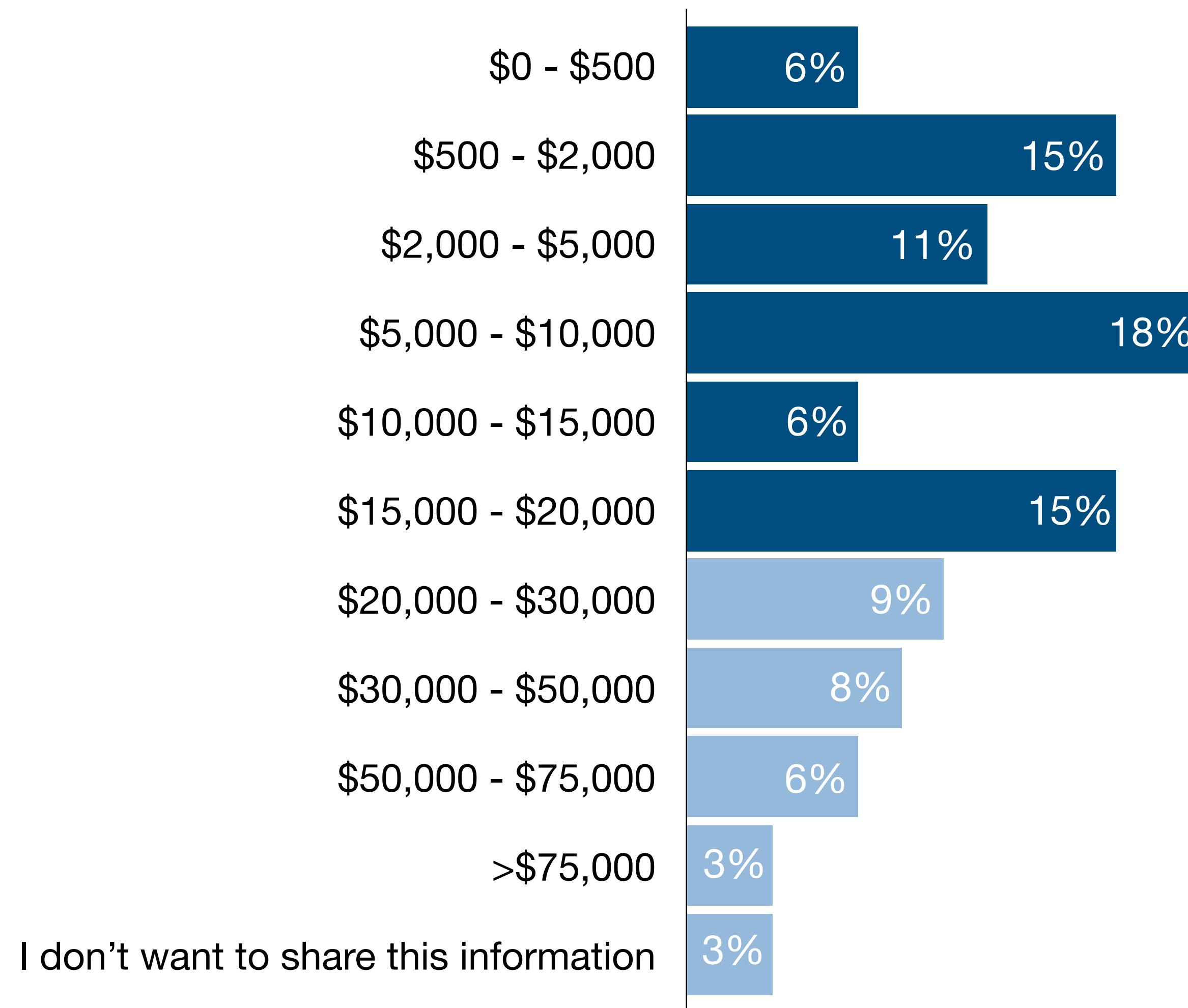
“Does working on your LPA(s) provide you with enough information about whether you can or should expand your farm?”



Costs & Labor

HOW MUCH MONEY ARE LPA-HOLDERS INVESTING?

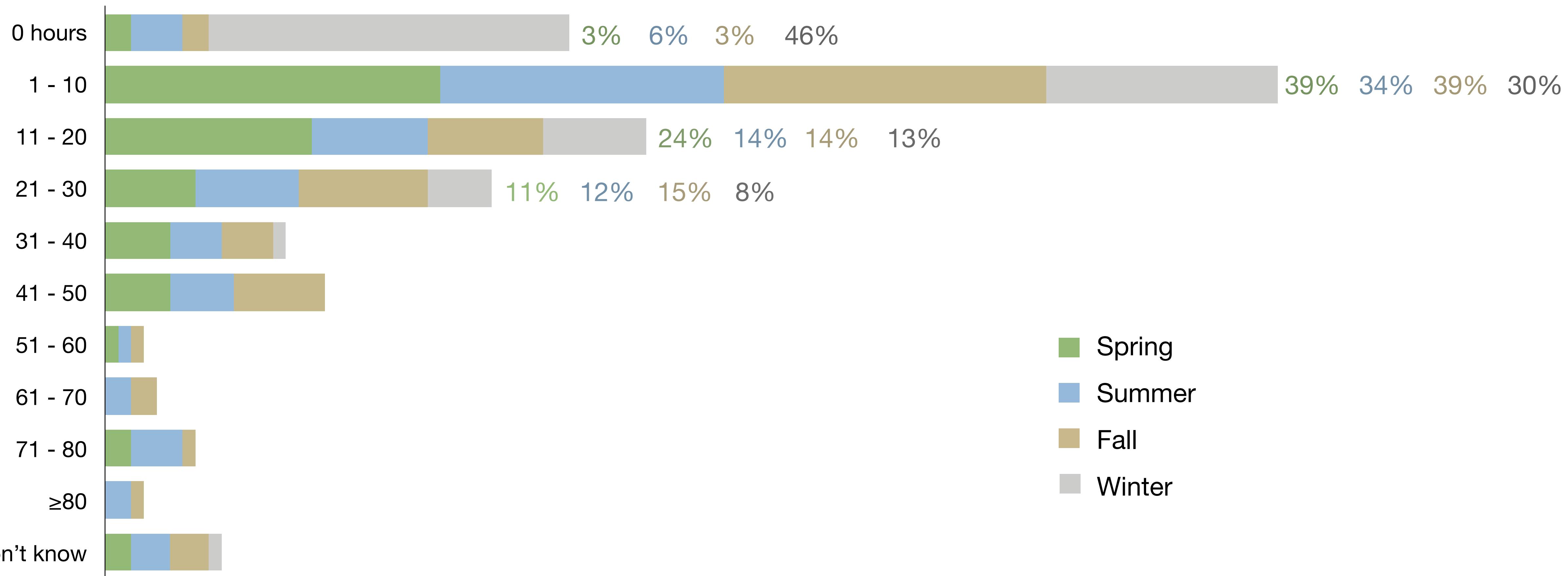
“Roughly how much money have you invested into your LPA(s)?”



Costs & Labor

HOW MUCH TIME ARE LPA-HOLDERS INVESTING?

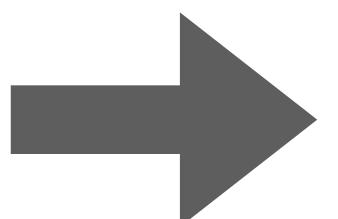
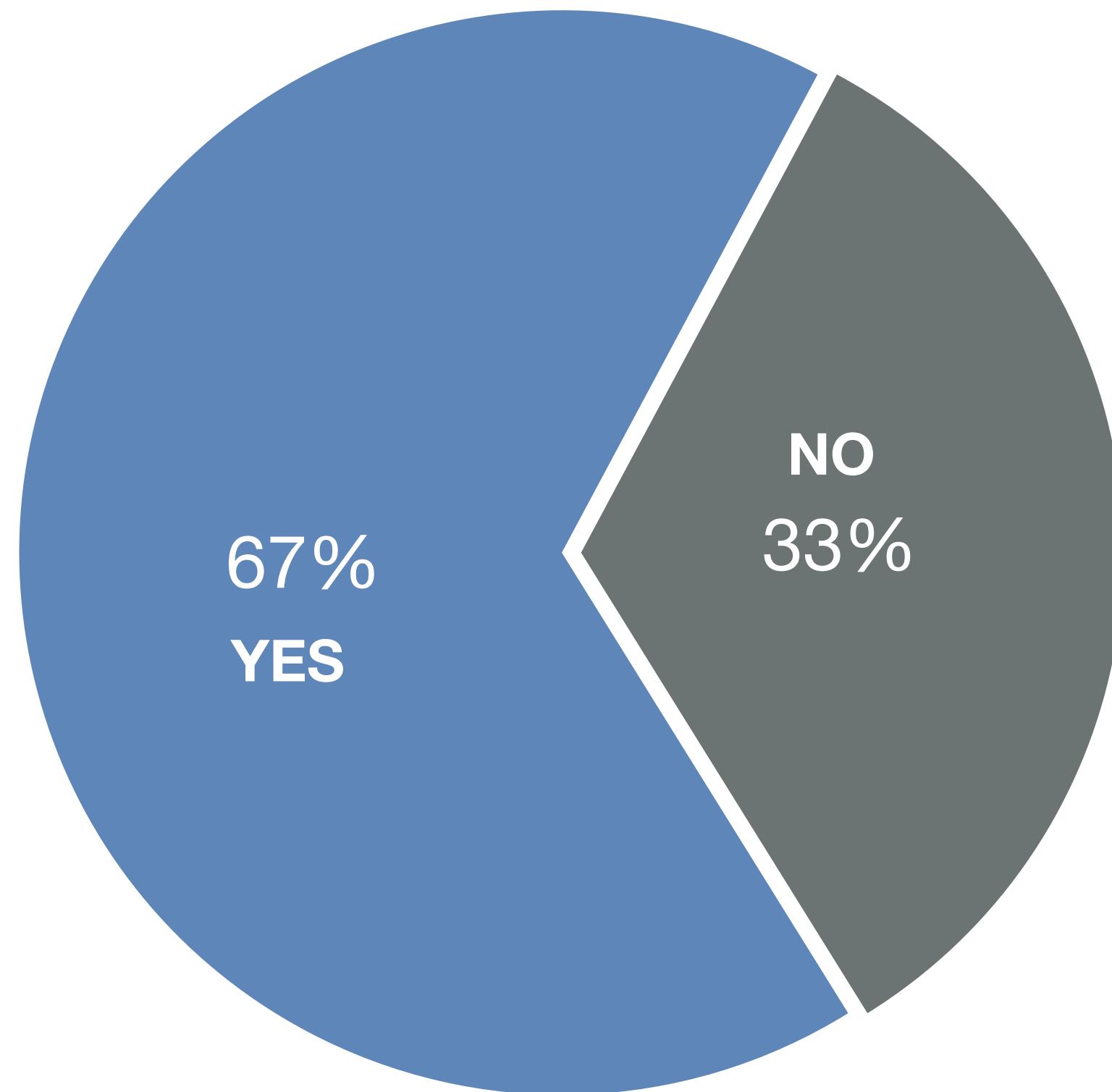
“During different seasons, roughly how many hours per week do you personally work on your LPA(s)?”



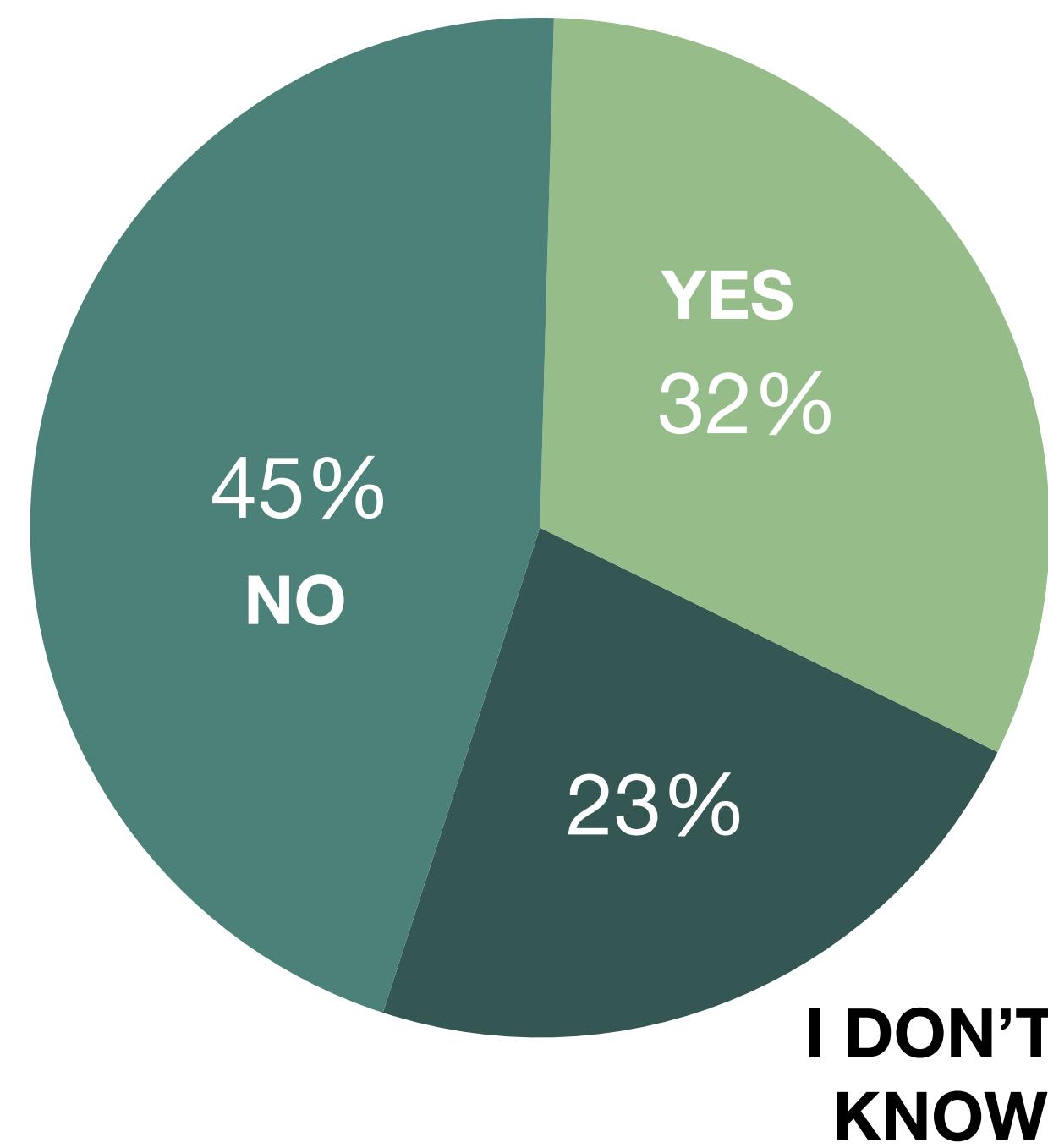
Commercialization

SELLING LPA PRODUCTS

“Do you sell the product(s) that you grow on your LPA(s)?”



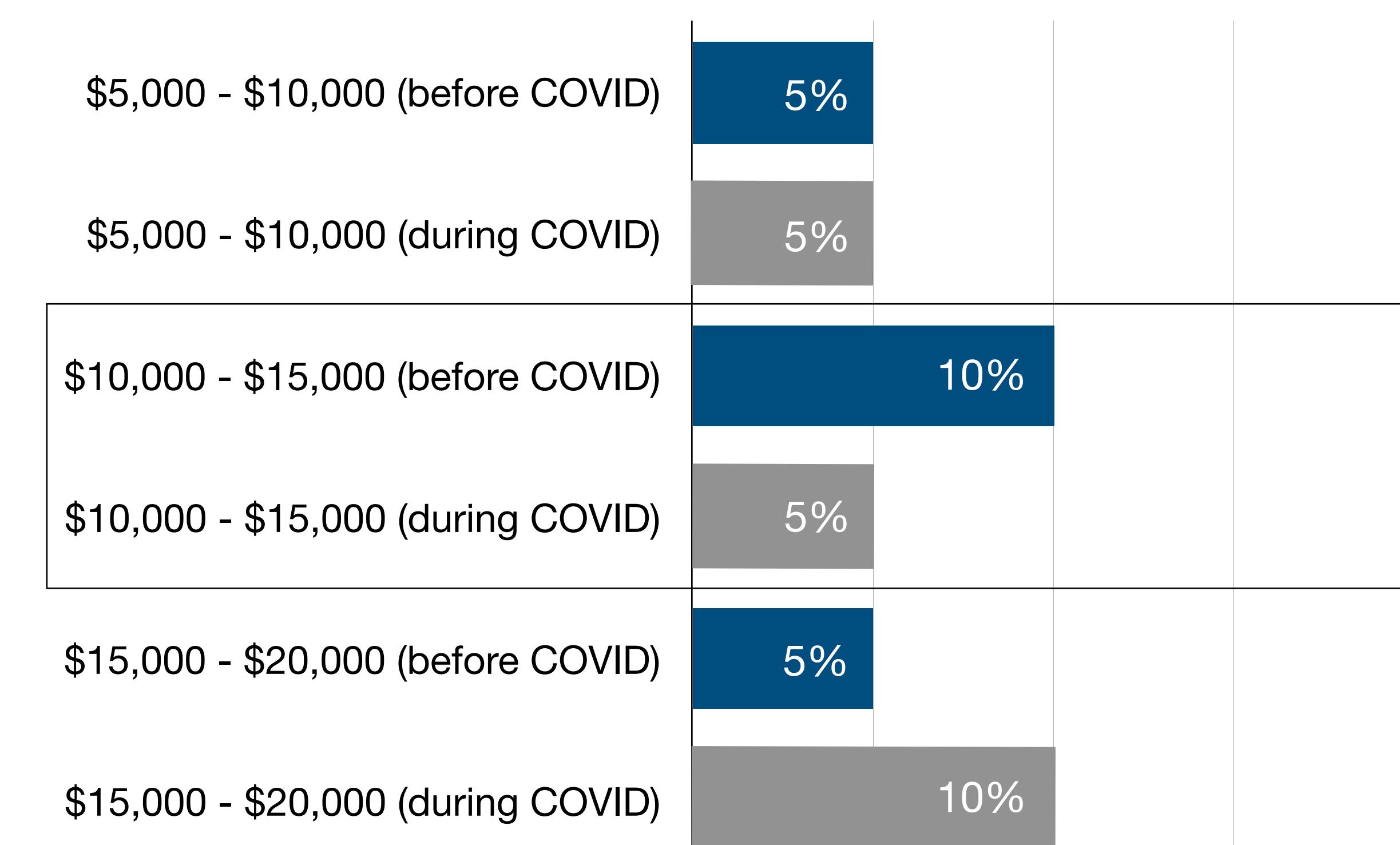
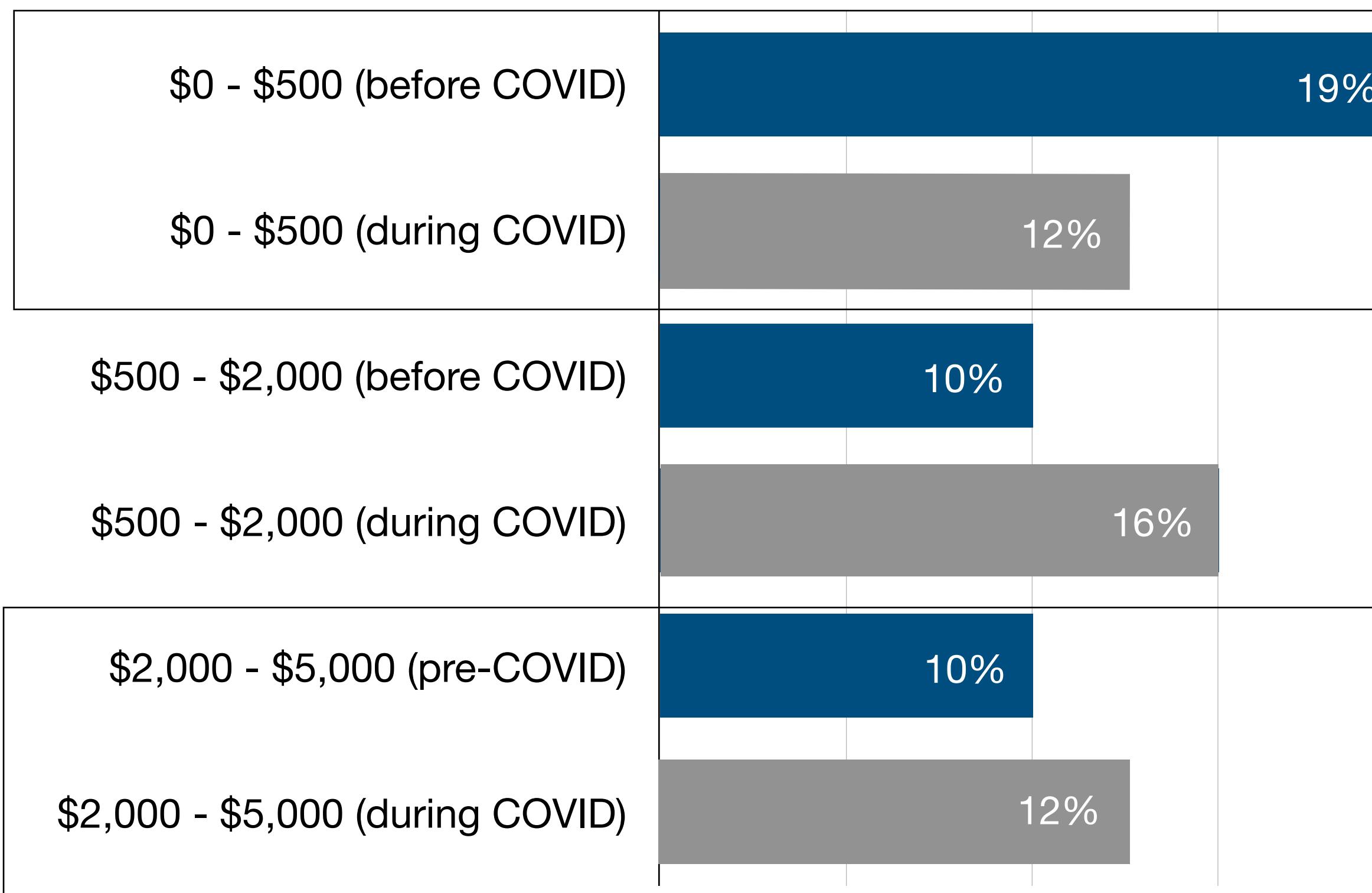
“Do you want to sell product(s) that you grow on your LPA(s)?”



Commercialization

HOW MUCH MONEY ARE COMMERCIAL LPA-HOLDERS MAKING

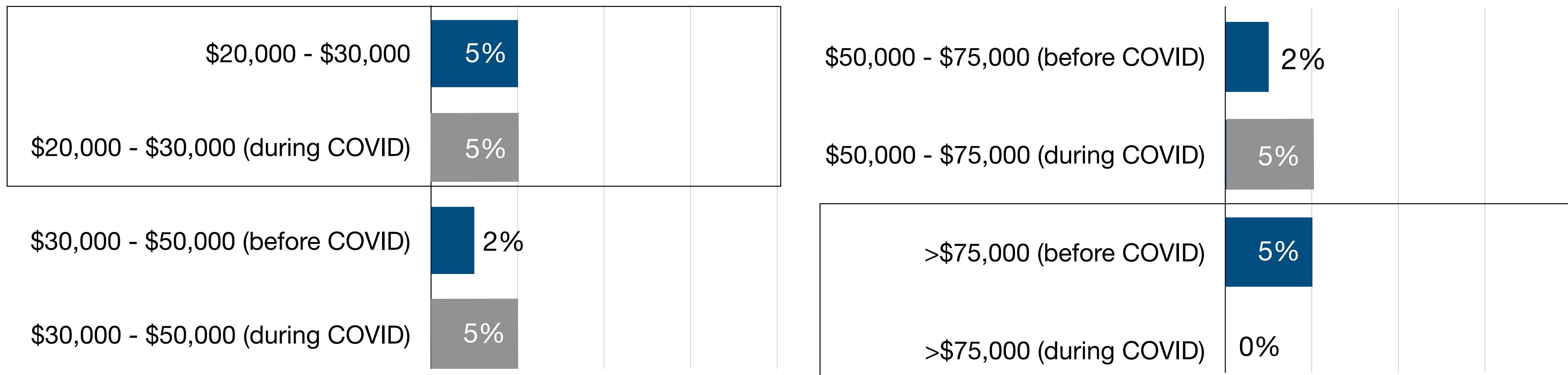
- Average annual sales before COVID-19 pandemic
- Average annual sales during the COVID-19 pandemic



Commercialization

HOW MUCH MONEY ARE COMMERCIAL LPA-HOLDERS MAKING

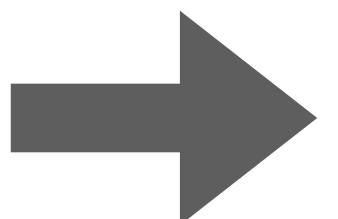
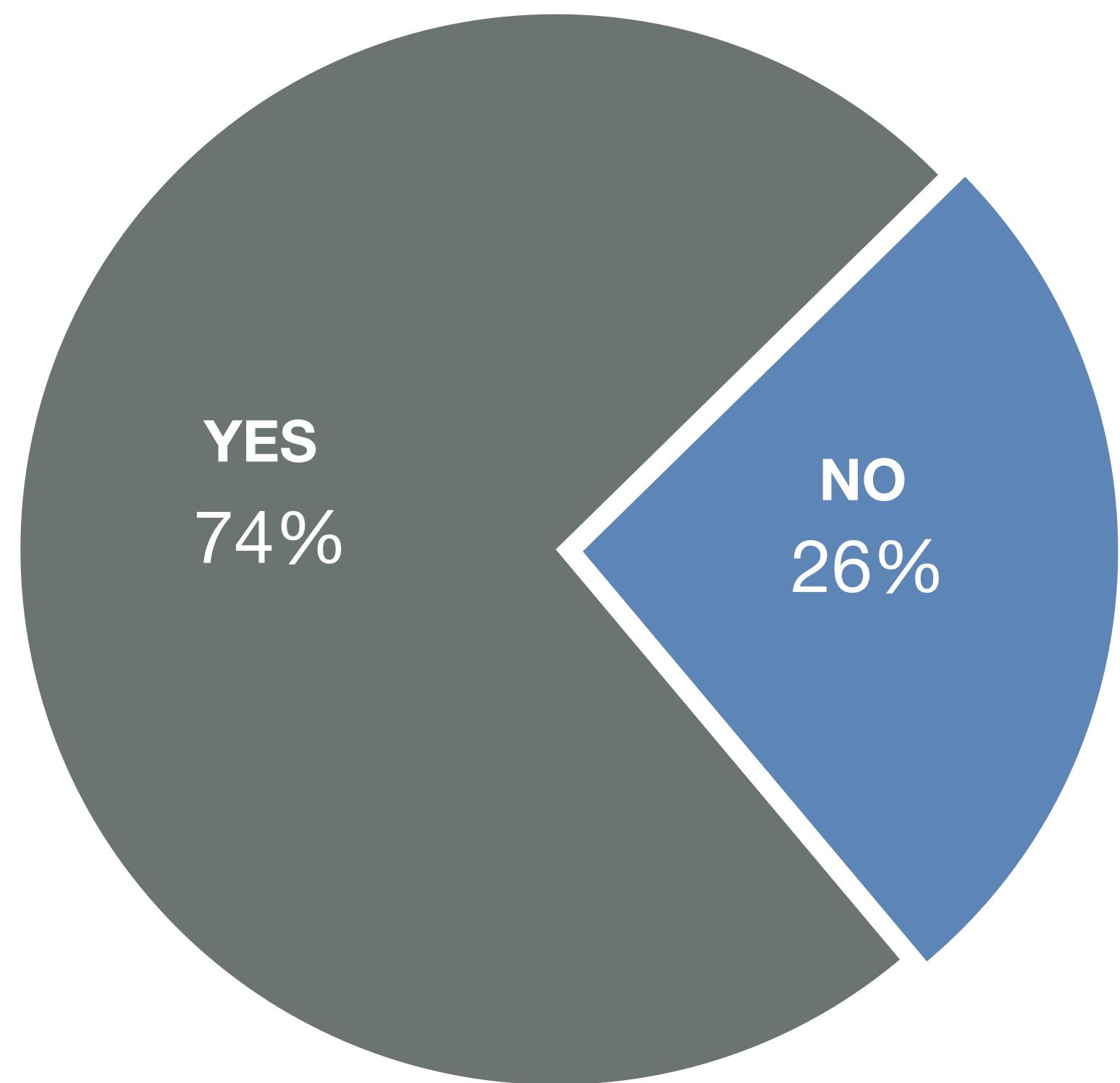
- Average annual sales before COVID-19 pandemic
- Average annual sales during the COVID-19 pandemic



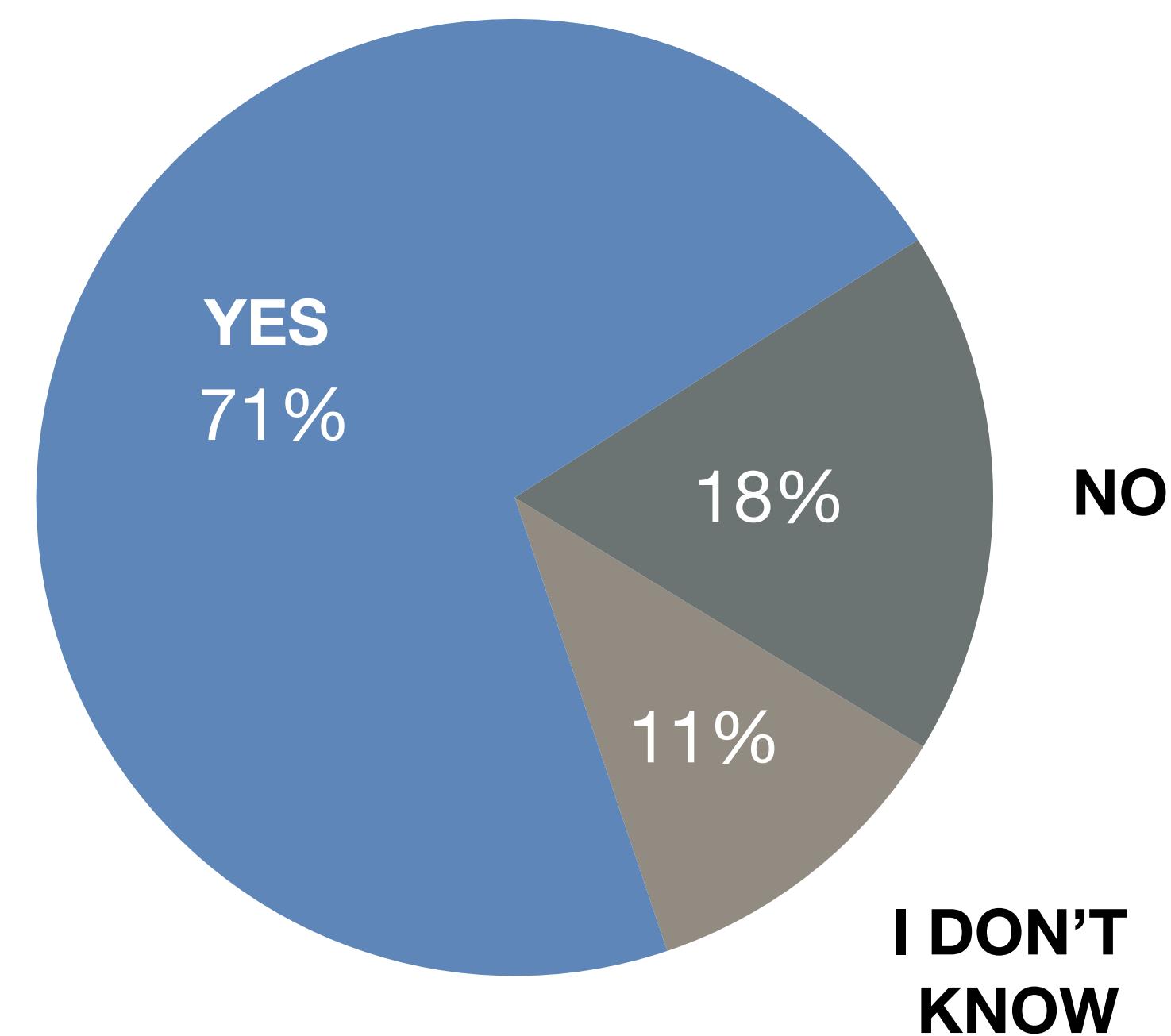
Commercialization

SHELLFISH-DEALER CERTIFICATION

“Are you a certified shellfish dealer?”



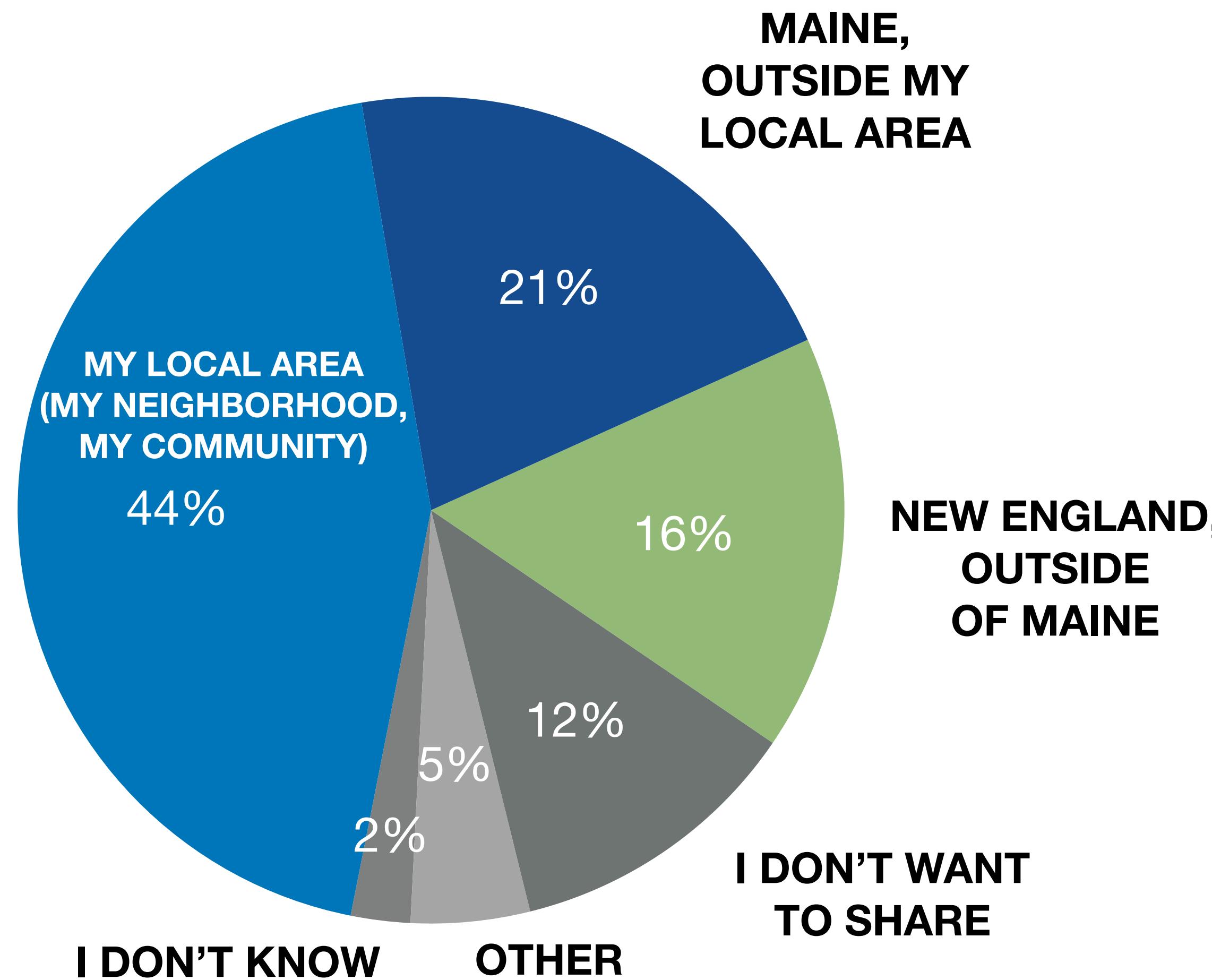
“Do you intend to become a certified shellfish dealer in the near future?”



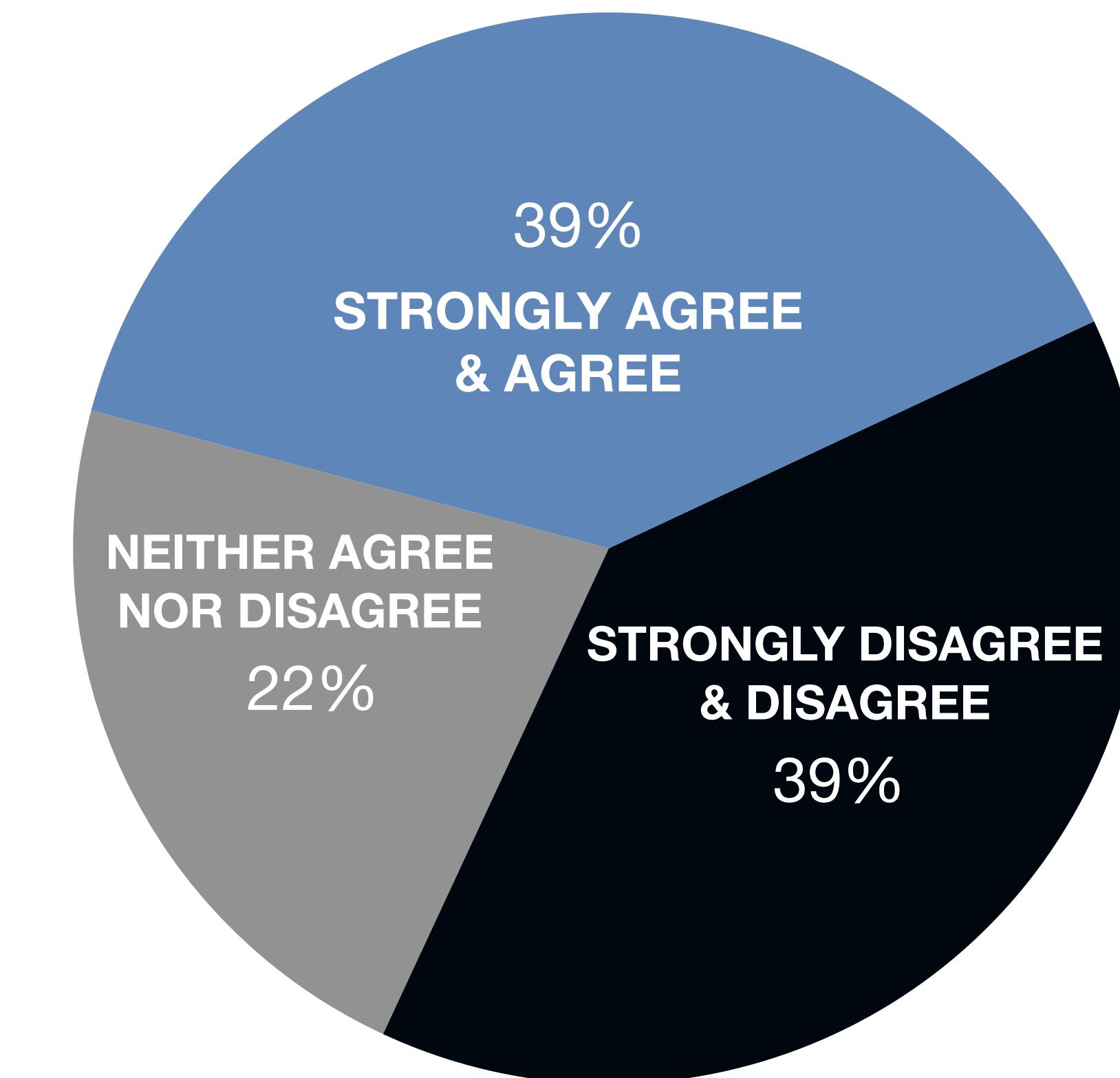
Commercialization

BUYERS OF LPA PRODUCTS

*"Where are the majority of your buyers located?
(Please select only 1 response.)"*



*"How much do you agree with the following statement:
'I am concerned with market saturation for the
product(s) of my LPA(s).'"*



Results: Focus Group Highlights

- Online, psuedo-anonymous focus group
- Email
- REDCap software

- Commercial LPA-holders
- 7 participants of 19 survey respondents who indicated interest

Results: Focus Group Highlights

NATURAL RESOURCES

Participants reported that:

- Obtaining seed/spores can be difficult
- Determining biological suitability for their LPA sites was difficult

KNOWLEDGE & SKILLS

Participants reported that their LPA required special expertise with:

- Assembling and managing their LPAs' rope lines
- Physical abilities to maintain their farms
- Maritime skills
- Operational experimentation

Participants reported that they received help for their LPAs from:

- Local knowledgeable/Previously equipped fishers, ocean farmers, and aquaculture organizations

PHYSICAL RESOURCES

- "My wife likes to joke that I have a kelp farm to justify my ownership of a boat."
- "I was even able to...borrow some stuff or get some hand-me-down stuff from people I knew, so that wasn't so much of a challenge."
- "Transport [of my harvested products once on land] is a challenge on my end...I've got to get stuff in, load it, and then drive three-and-a-half hours to Portland where I can sell it."

Focus Group Highlights

ECONOMIC RESOURCES

Participants reported that:

- They often have different sources of income besides selling their LPA products; they needed exterior economic resources to sufficiently experiment on their LPAs
- Costs (time and money) of the LPA application were not onerous

LEGAL LICENCE TO OPERATE

Participants reported that:

- The application process for larger aquaculture leases is frustratingly slow
- It can be difficult to keep up with the DMR regulations
- They were frustrated by density limits

Focus Group Highlights

COMMERCIALIZATION

Participants reported that:

- Their LPAs allow for experimentation toward scaling up their aquaculture
- Making enough money on their LPAs to increase production, hire assistants, purchase additional equipment, develop their marketing skills, and/or apply for larger leases is very challenging
- Their operations change frequently because of various circumstances that developing a formal business plan feels useless
- Accessing non-local markets independently is very challenging

SOCIAL LICENCE TO OPERATE

Participants reported that:

- Conflicts with riparian neighbors are their primary SLO concern, and sometimes their primary concern overall
- They have often received highly beneficial help from local fishers and fellow ocean farmers

IV. Discussion: Is the LPA system working as designed?

Design of LPA system:

- Attract and retain entrants
- Support experimentation, including commercialization
- Balance SLO issues

This study's data indicate that this design is being realized to a significant extent.

Outcomes of Maine's small-scale marine aquaculture development

- Effective marine aquaculture training programs
- A boom of successful LPA-holders
- LPA-holders feel equipped to make informed decisions about operational expansion
- 78% of LPA-holders are selling or want to sell their LPA products

The LPA system is firmly situated at the small-scale

- LPA work is largely part-time and not a primary source of income
- Most LPA-holders invest and have sales less than \$20,000
- Most buyers of LPA products are individual consumers and restaurants in Maine
- Concerns persist around slow lease application processing, and with SLO conflicts with riparian neighbors

Is there a bottleneck of labor at the LPA level?

**Comparable attention is needed for
Experimental and Standard Leasing:**

- Market development
- Sector scaling
- Support for farmers to address SLO issues