

SUSTAINABLE
LOCAL
HEALTHY



Promoting healthy oceans with sustainable shellfish aquaculture



Outreach Program



*Build public knowledge and understanding around some of the **basic issues** surrounding the VSE and shellfish aquaculture*





Outreach Program



*Build public knowledge and understanding around some of the **basic issues** surrounding the VSE and shellfish aquaculture*



*Make our working waterfront community aware of the **opportunities** that the VSE presents*





Outreach Program



*Emphasize that the process of establishing a harbor-based mussel aquaculture operation will unfold over the course of **several years***





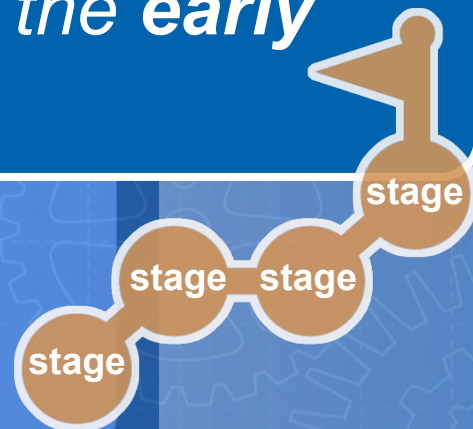
Outreach Program



*Emphasize that the process of establishing harbor-based mussel aquaculture operation will unfold over the course of **several years***



*Solicit the input of stakeholders in the **early stages** of the VSE project*





Outreach Program



*Emphasize that the process of establishing harbor-based mussel aquaculture operation will unfold over the course of **several years***



*Solicit the input of stakeholders in the **early stages** of the VSE project*



Address questions, concerns, and comments as information becomes available to our team





Outreach Program

*Intro to Shellfish
Aquaculture &
the VSE*

1



Outreach Program

*Intro to Shellfish
Aquaculture &
the VSE*

1

*Biology &
Growing
Technology*

2



Outreach Program

*Intro to Shellfish
Aquaculture &
the VSE*

1

*Biology &
Growing
Technology*

2

*Economic
Impacts/Benefits*

3



Outreach Program

*Intro to Shellfish
Aquaculture &
the VSE*

1

*Biology &
Growing
Technology*

2

*Economic
Impacts/Benefits*

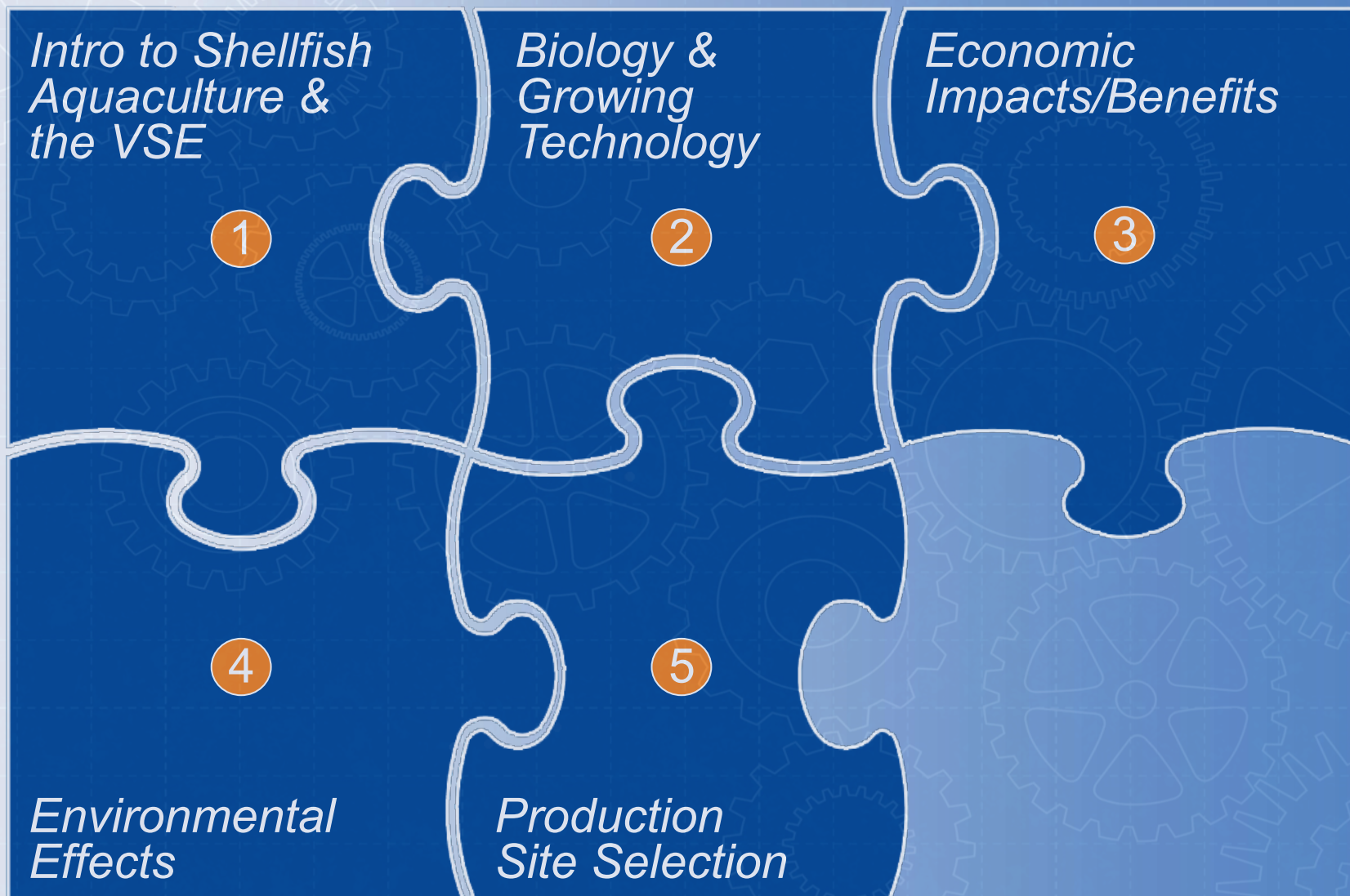
3

*Environmental
Effects*

4



Outreach Program





Site Planning Workshops

Date: July 11, 2017

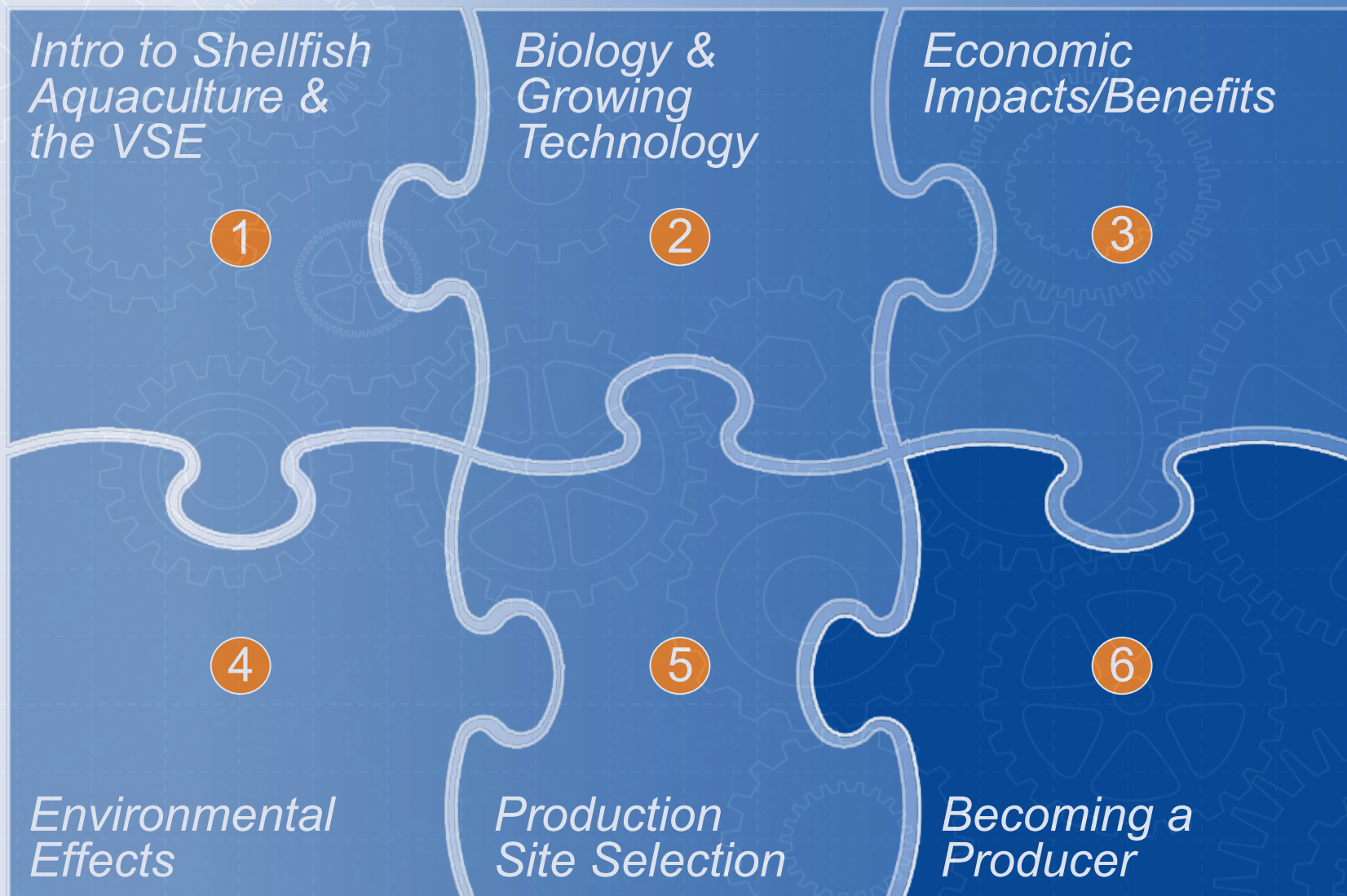
Venue: Four Points Sheraton

Time: 7:00 – 8:30 p.m.





Outreach Program





Project Evolution



2015 to 2017

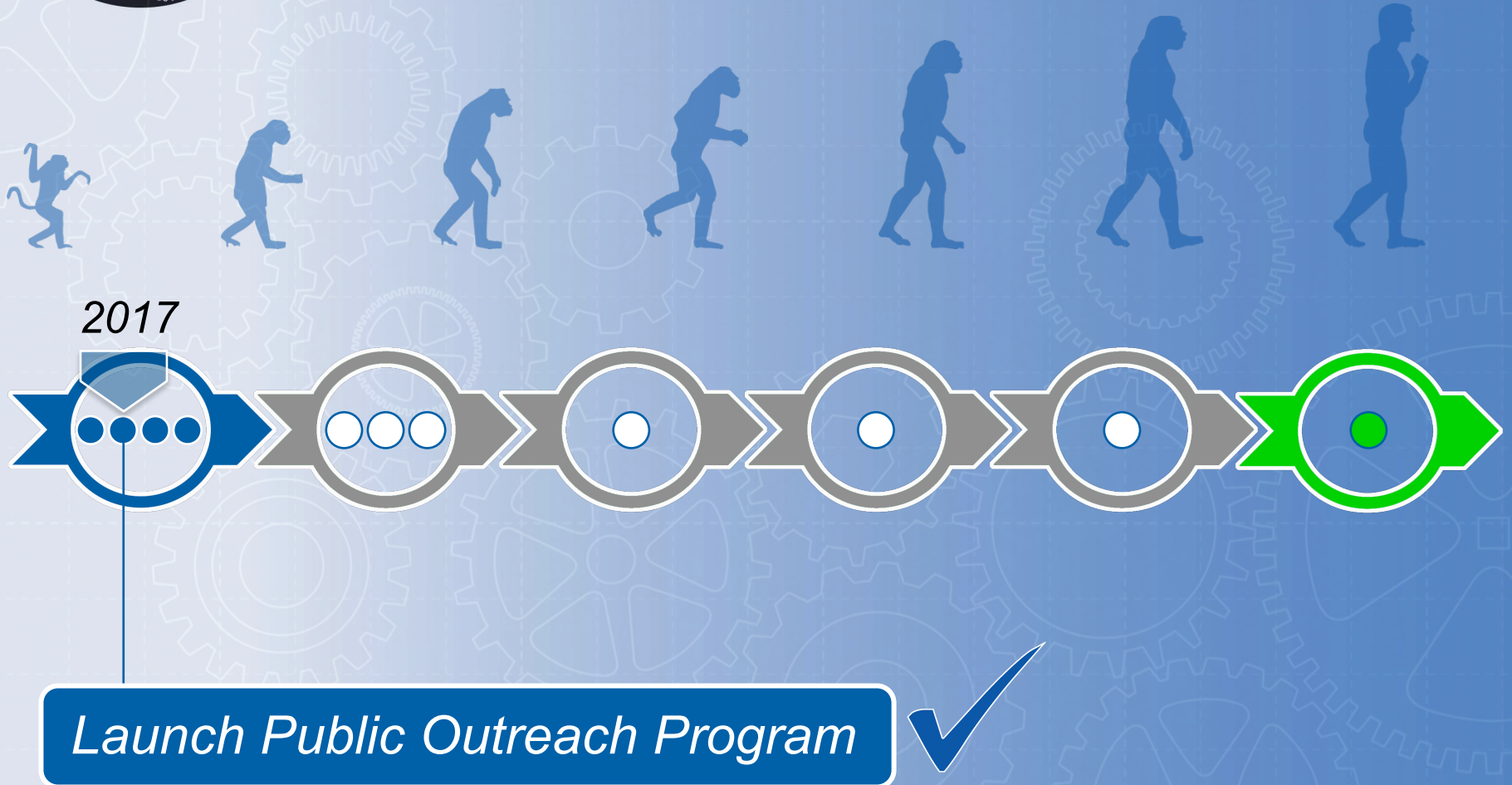


Create Strategic Permitting Plan



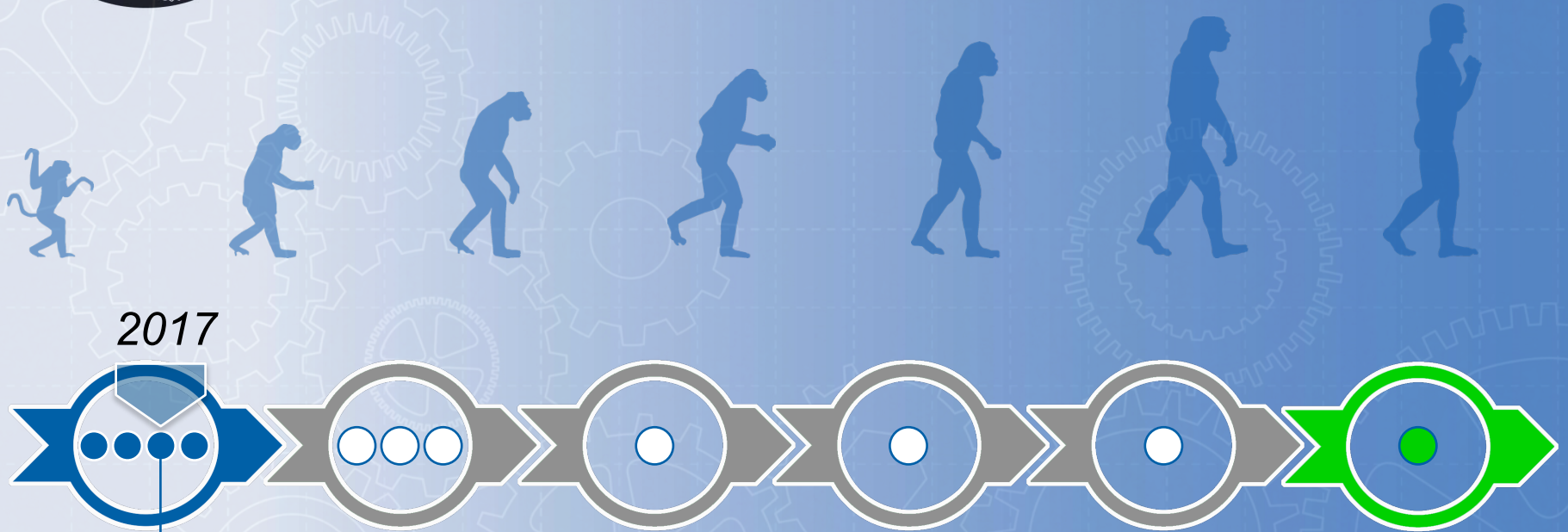


Project Evolution





Project Evolution



2017

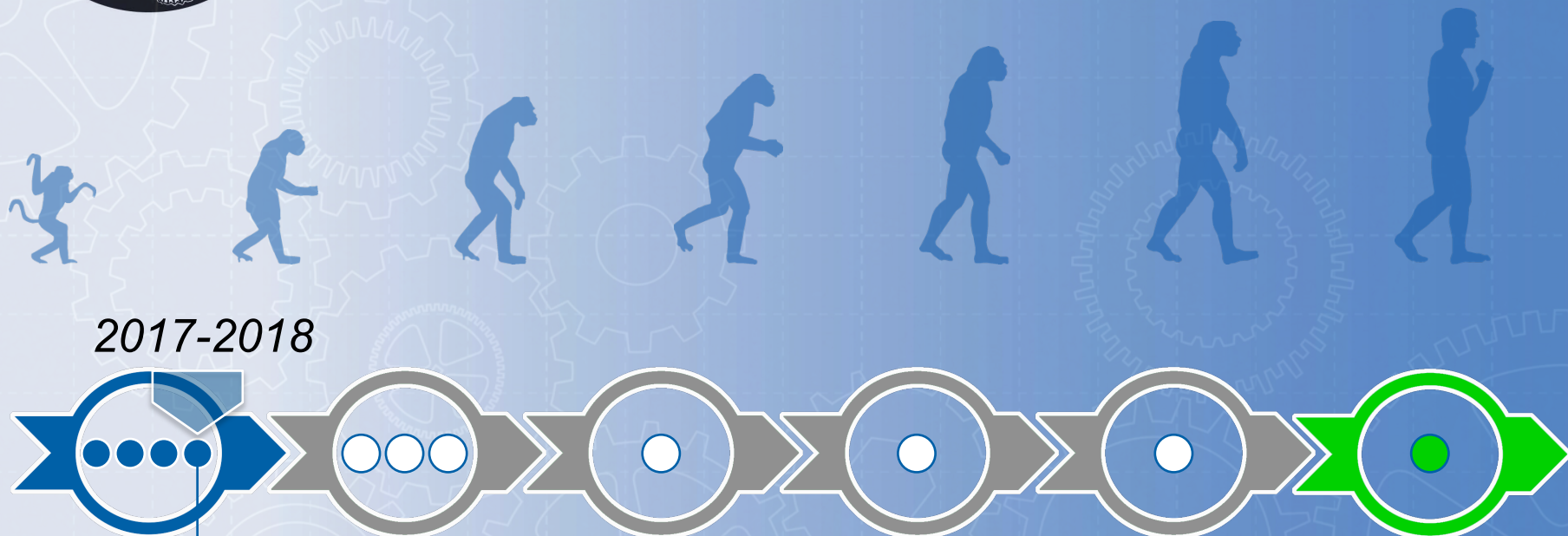
*Select Production Site
with Community Input*



in progress



Project Evolution



2017-2018

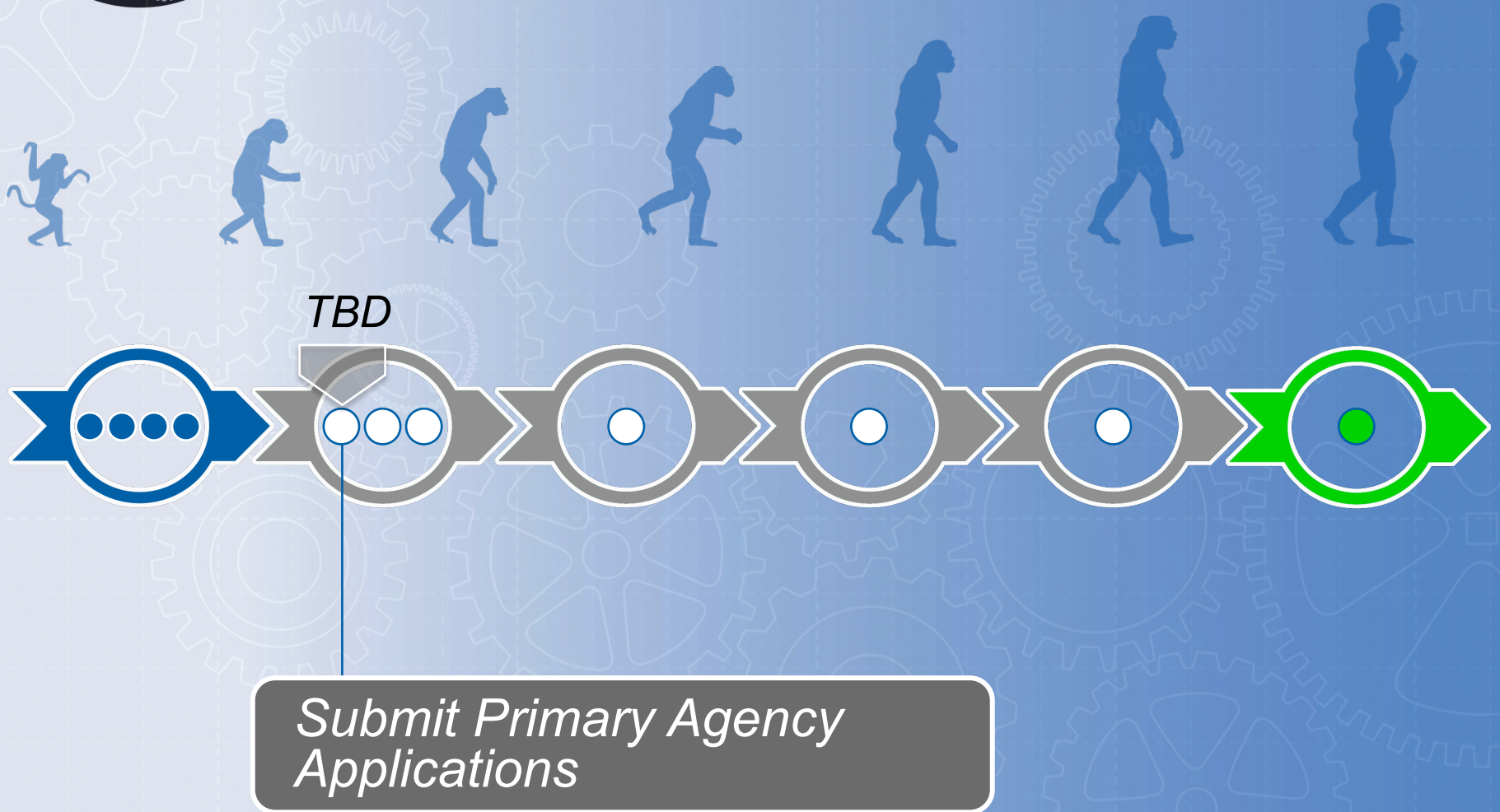
Submit Lease Template for State Review | Circulate Draft EIR



in progress

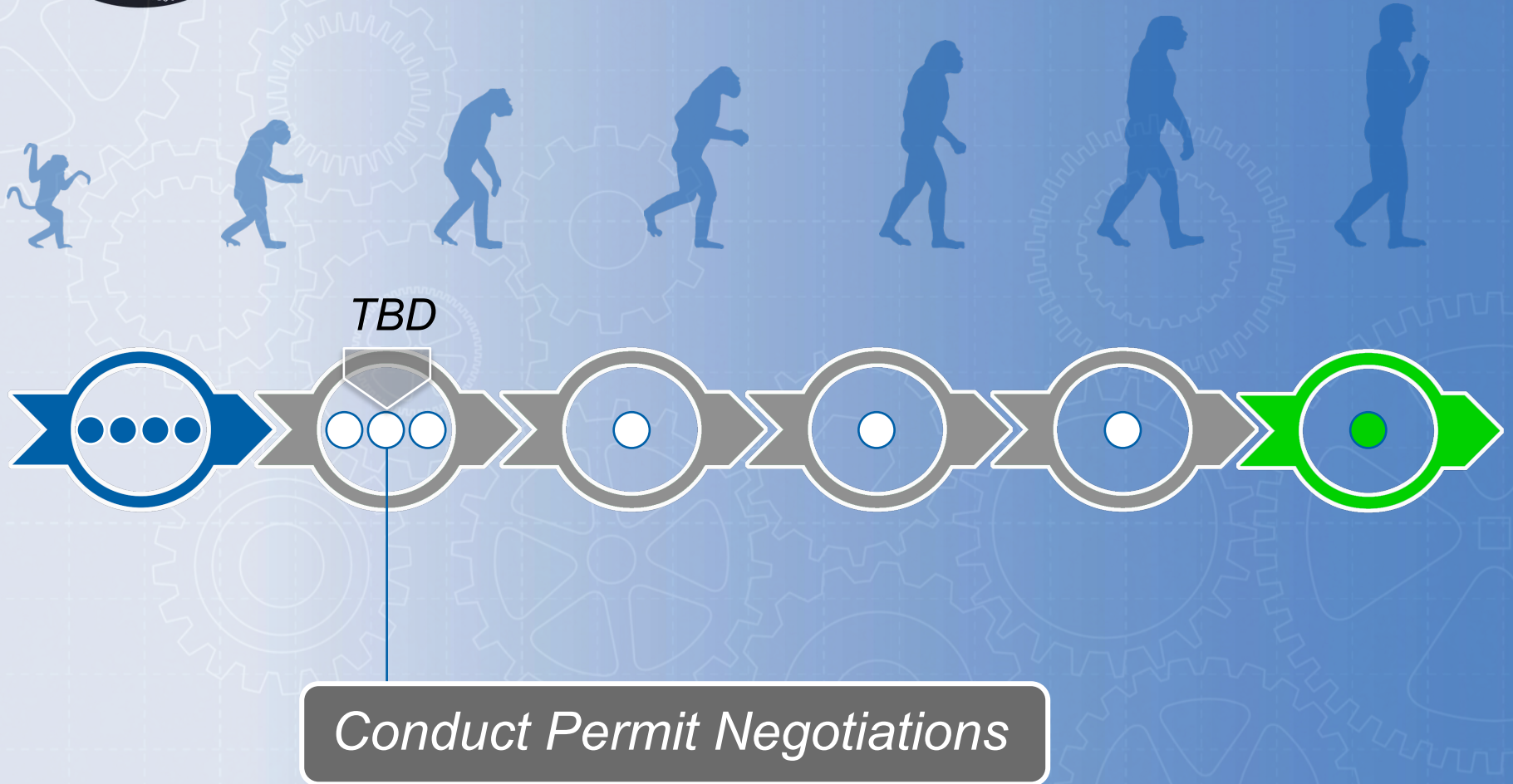


Project Evolution



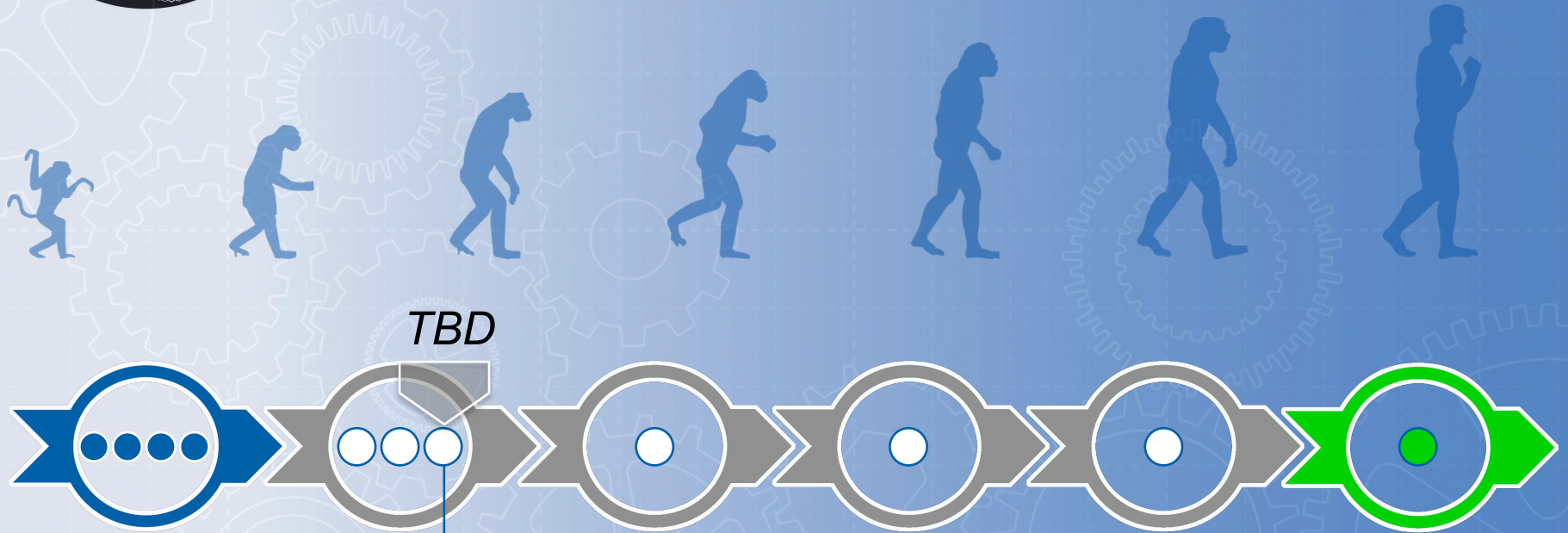


Project Evolution





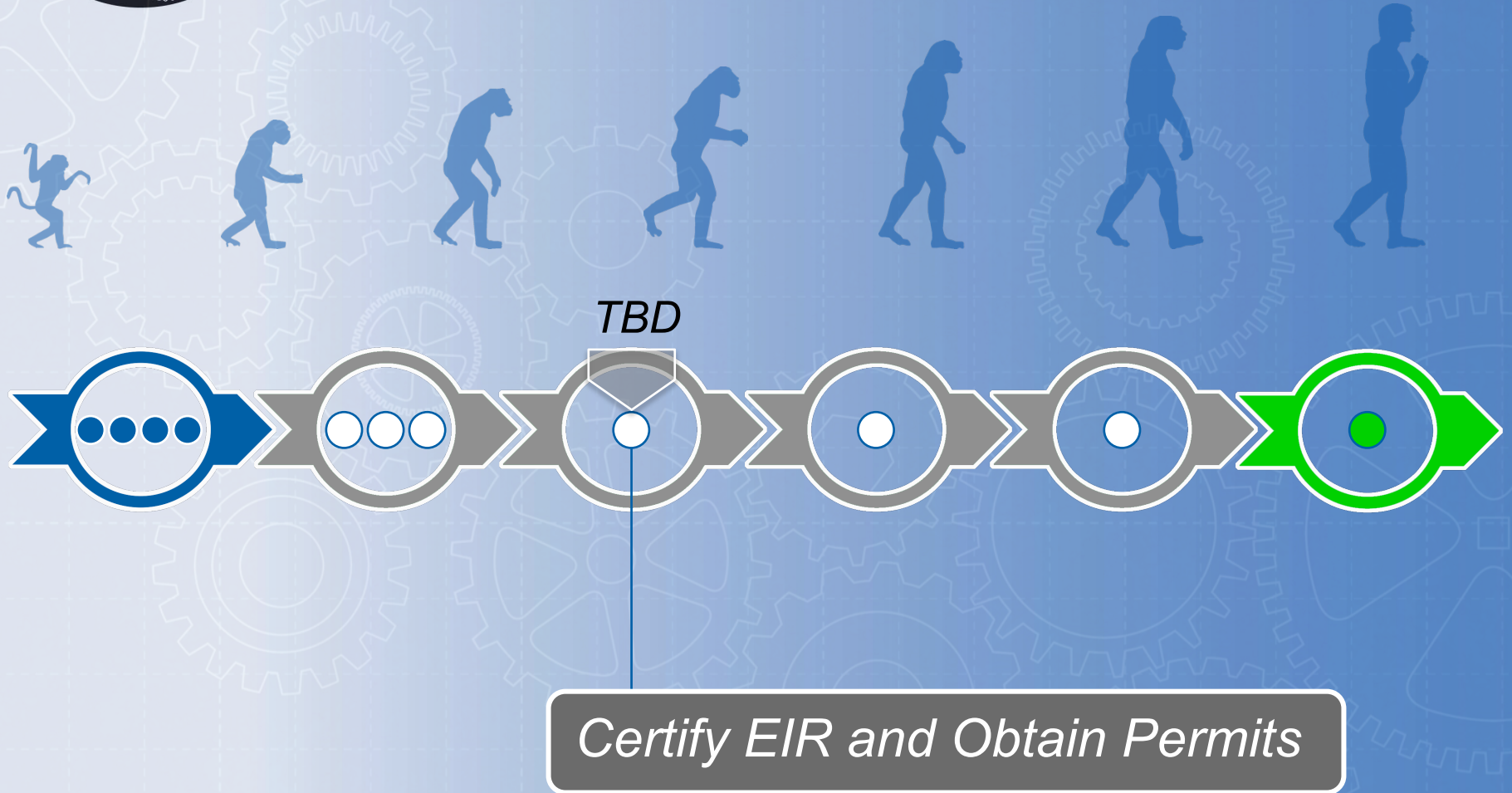
Project Evolution



*Begin Developing a Voluntary Grower
Training & Certification program*

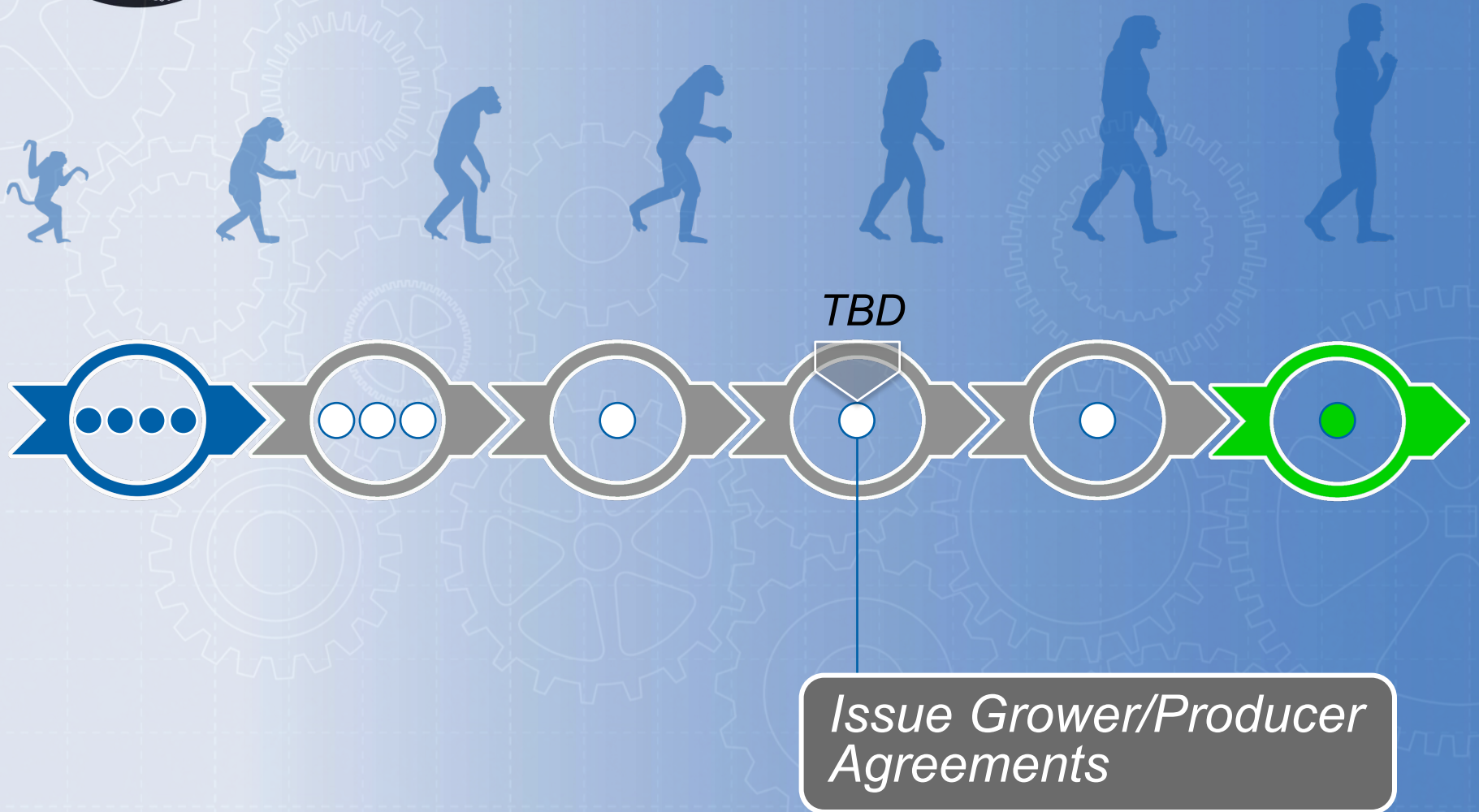


Project Evolution



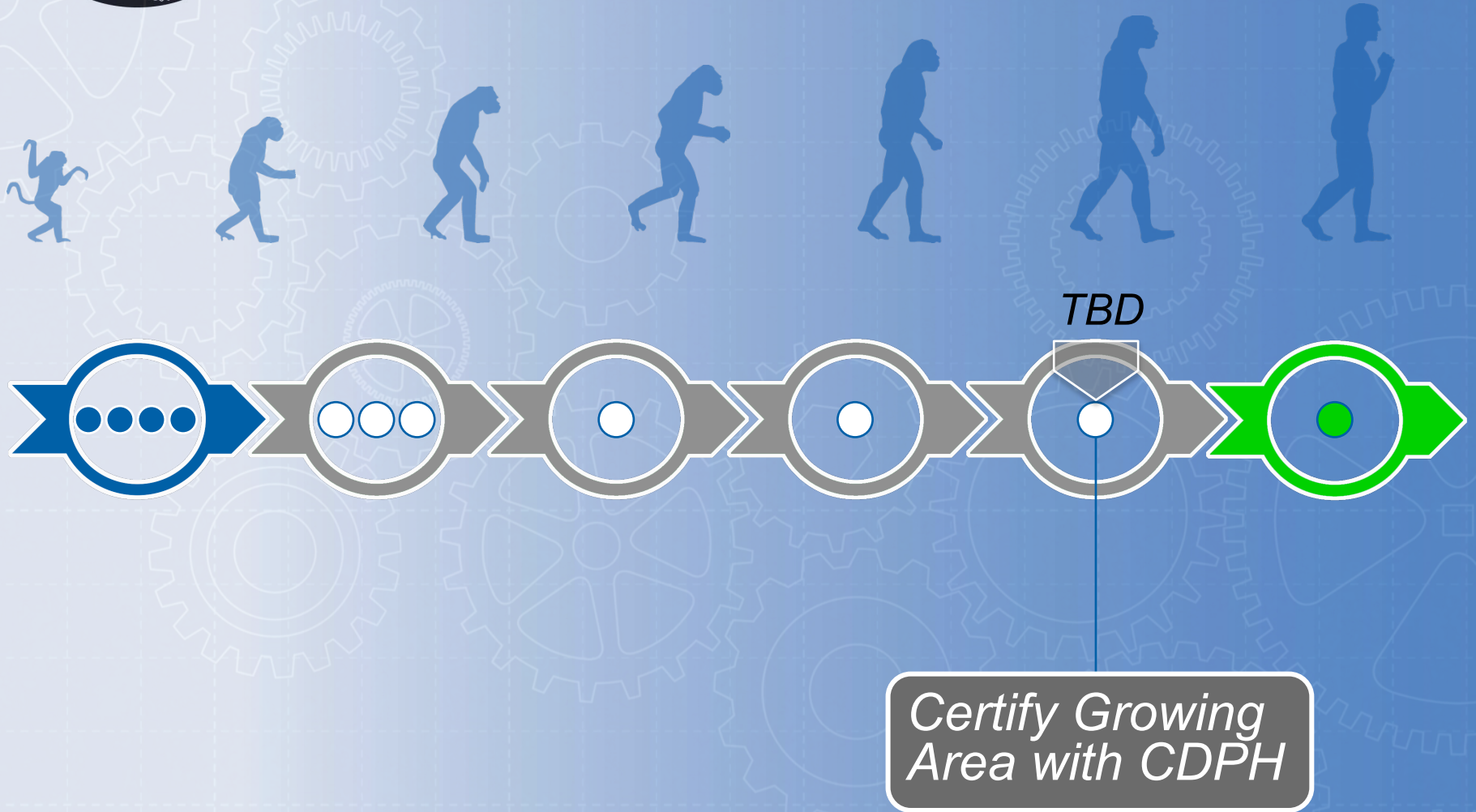


Project Evolution



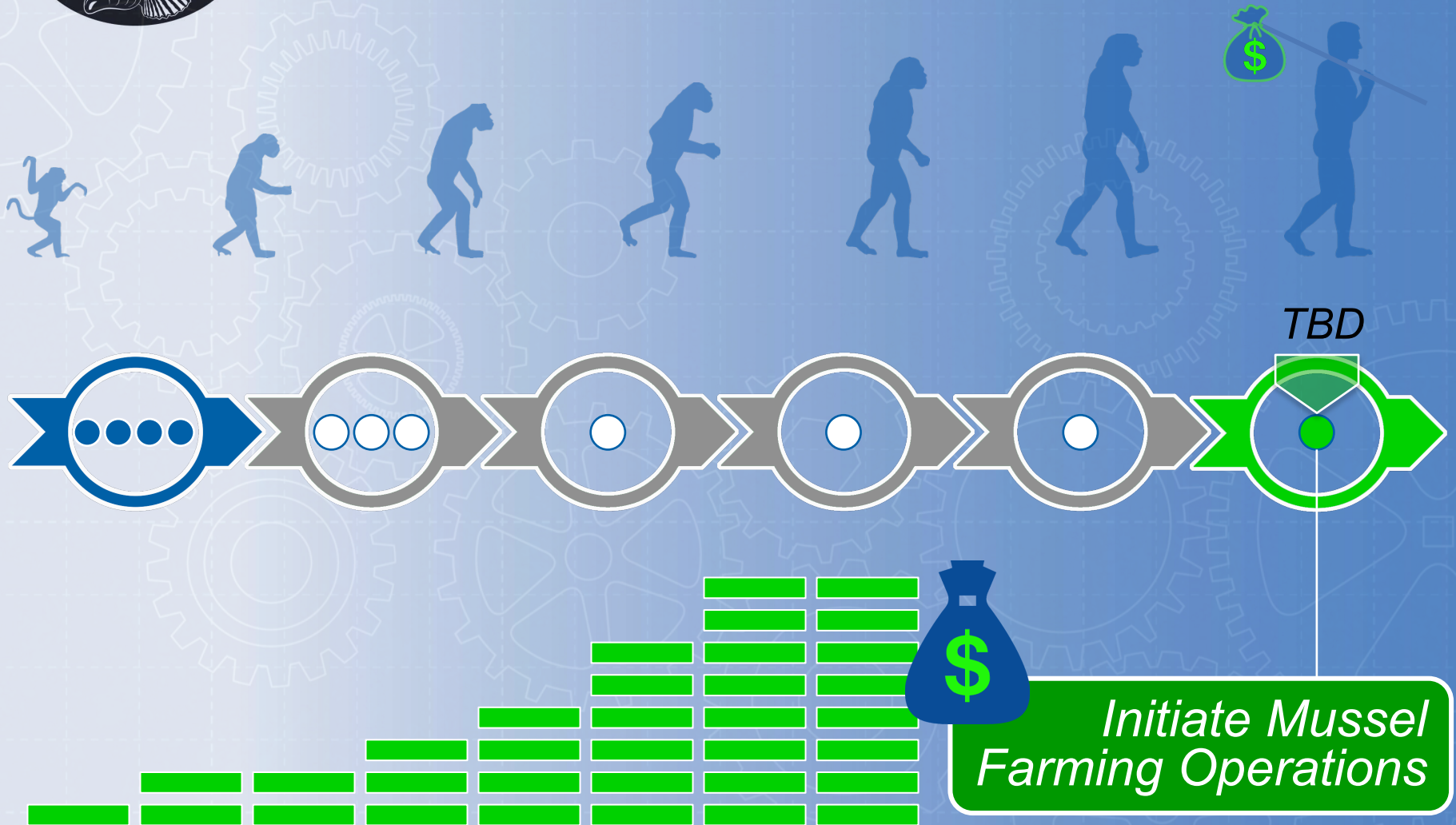


Project Evolution





Project Evolution





Open Issues

Questions surrounding the business of mussel aquaculture



***Lease
Criteria***



***Organizational
Structure***



***Grower
Support***



***Farming
Operations***





Open Issues

Questions surrounding the business of mussel aquaculture



**Lease
Criteria**



**Organizational
Structure**



**Grower
Support**



**Farming
Operations**





Lease Criteria



**Lease
Criteria**

“

*How will leases or permits be
crafted and what will be the
permit fees?*



”



Lease Criteria



**Lease
Criteria**

“

*Is it possible to partner on a
100-acre site or divide a site
up into a smaller area?*



”



Lease Criteria



**Lease
Criteria**

“

*Can permits be transferred
from the Ventura Port District
to grower/producers?*



”



Open Issues

Questions surrounding the business of mussel aquaculture



**Lease
Criteria**



**Organizational
Structure**



**Grower
Support**

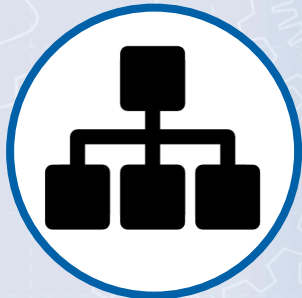


**Farming
Operations**





VSE Organization



***Organizational
Structure***

“

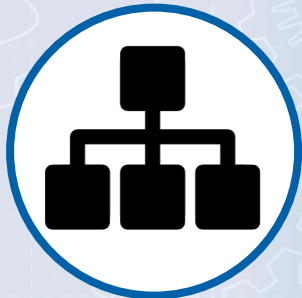
*Is this venture suitable for a
co-op or non-profit?*

”





VSE Organization



***Organizational
Structure***

“

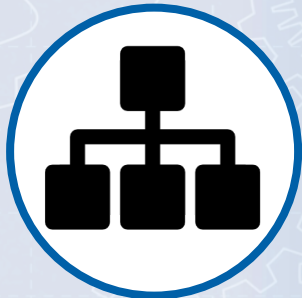
*How will the VSE interface
with the Ventura Port District
who holds the leases?*

”





VSE Organization



***Organizational
Structure***

“

*Will stakeholder reps have the
option of being members of a
VSE Board?*

”





Open Issues

Questions surrounding the business of mussel aquaculture



***Lease
Criteria***



***Organizational
Structure***



***Grower
Support***



***Farming
Operations***





Grower Support



**Grower
Support**

“

How can the small grower get involved?

”





Grower Support



**Grower
Support**

“

What types of support will be offered?

”





Grower Support



**Grower
Support**

“

*What kind of program is the
VSE going to use to help
finance the growers ?*

”





Open Issues

Questions surrounding the business of mussel aquaculture



***Lease
Criteria***



***Organizational
Structure***



***Grower
Support***



***Farming
Operations***

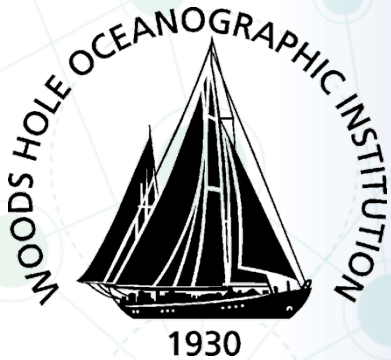




Workshop 6

Becoming a VSE Shellfish Producer

The Business of Mussel Farming: An Overview of Start-up and Operating Costs



Scott Lindell

*Principal Investigator | Woods Hole
Oceanographic Institution, MA*

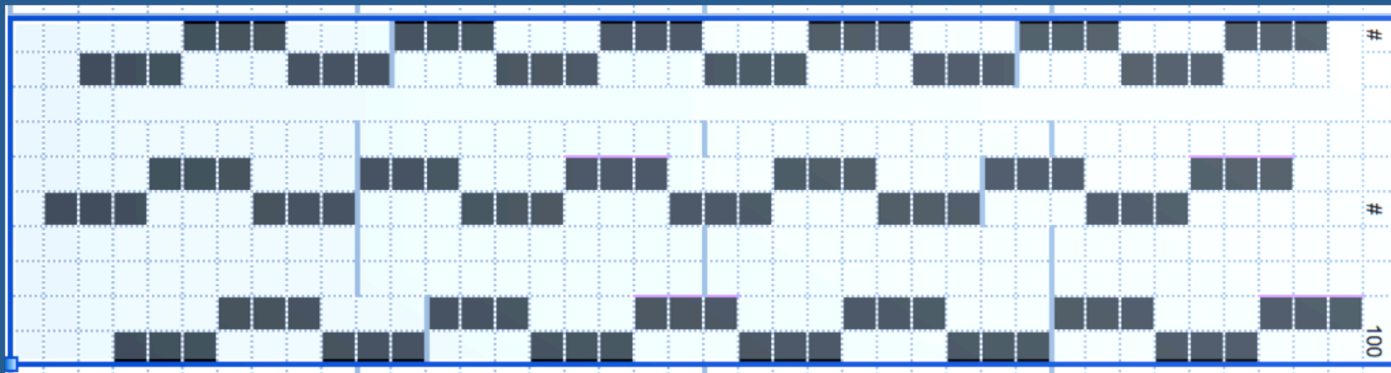


Business Planning for Mussel Farming in California

Scott Lindell
June 1, 2017

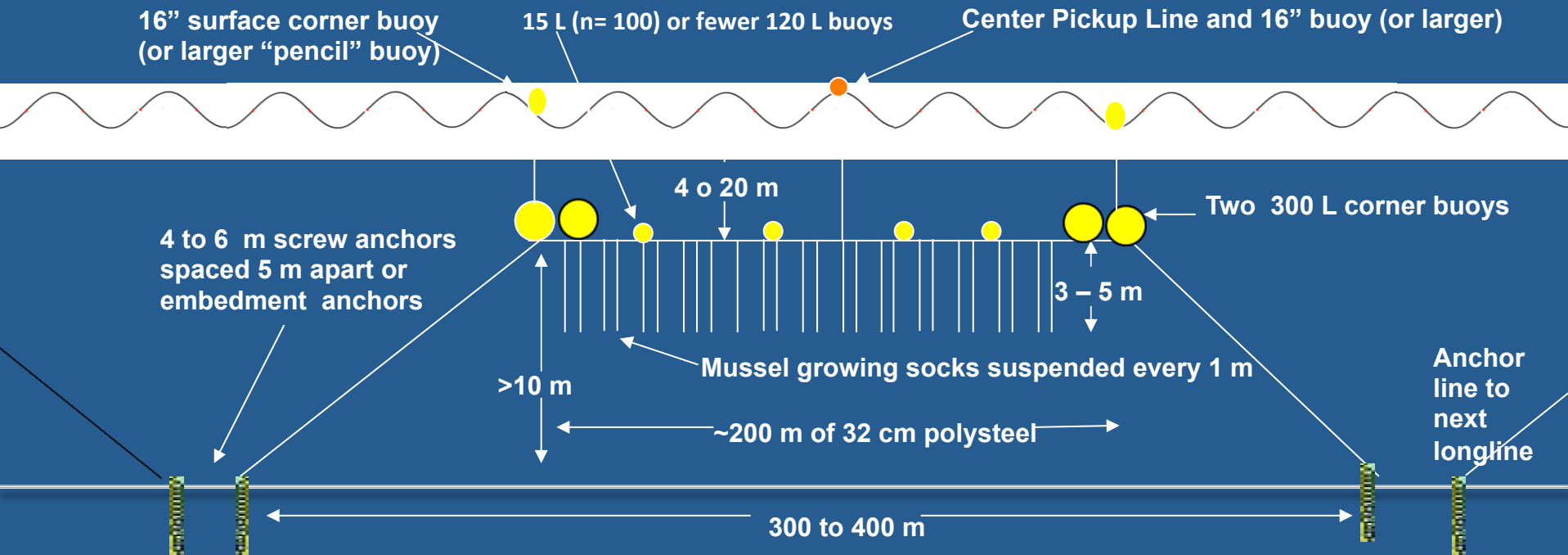
Business Planning for Offshore Farm

- What could a farm look like?



- Bird's eye view of 36 longlines on 100 acres

General plan for submerged longlines



1. Anchor lines with 2 or 3:1 scope from anchor to submerged corner buoy
2. Submerged buoyancy keeps lines tight despite waves and storms

Business Planning for Offshore Farm

- Capital Costs of Longline Installation
 - Headrope (200 m) and Anchor Lines ~ \$1,200
 - Special grow ropes ~ \$0.30 to \$0.50 per foot
 - Quality Equipment in NZ is chief supplier
 - Anchors ~ \$1,500 to \$2,500 each
 - Buoys ~ \$0.50 to \$0.75 per pound flotation

Mussel growing technology choices

Anchors

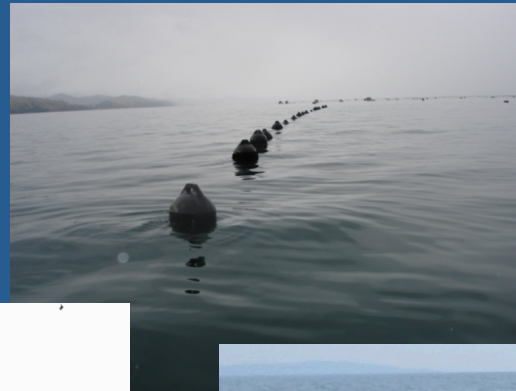
- Consider sediment type, depth, wave and current exposure for adequate holding
- Screw anchors = most effective
 - \$2,000 to \$3,000 each in volume (dozens,
 - Different discs and specs. for different sediments
 - Specialty installation
- Drag embedment type anchor (100 to 250 kg)
 - Deployable from small boats for starters
 - \$800 to \$2,000 each



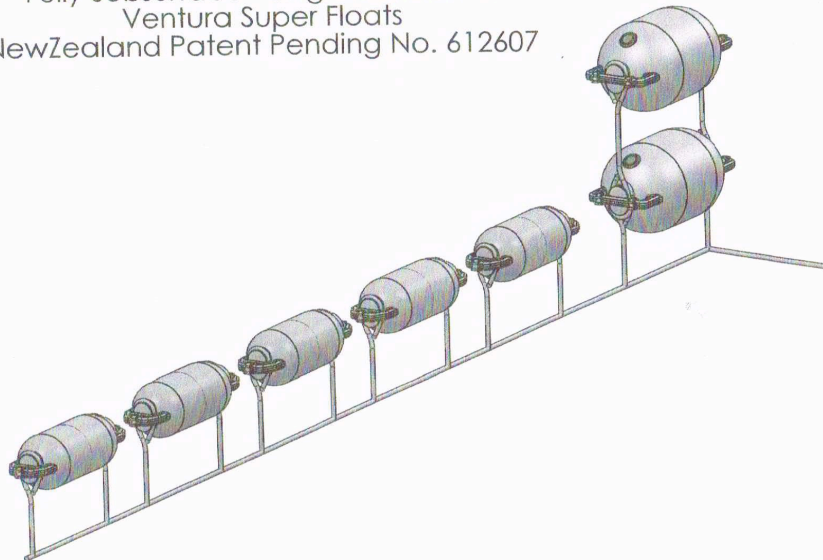
Mussel growing technology choices

Buoys, floats

- Durable, submersible, strong attachment point
- Critical investment
- Need ~ 2,000 L per line
- 200 to 300 L corner buoys



Fully submersible - single Jacksons
Ventura Super Floats
New Zealand Patent Pending No. 612607



Offshore Shellfish, UK

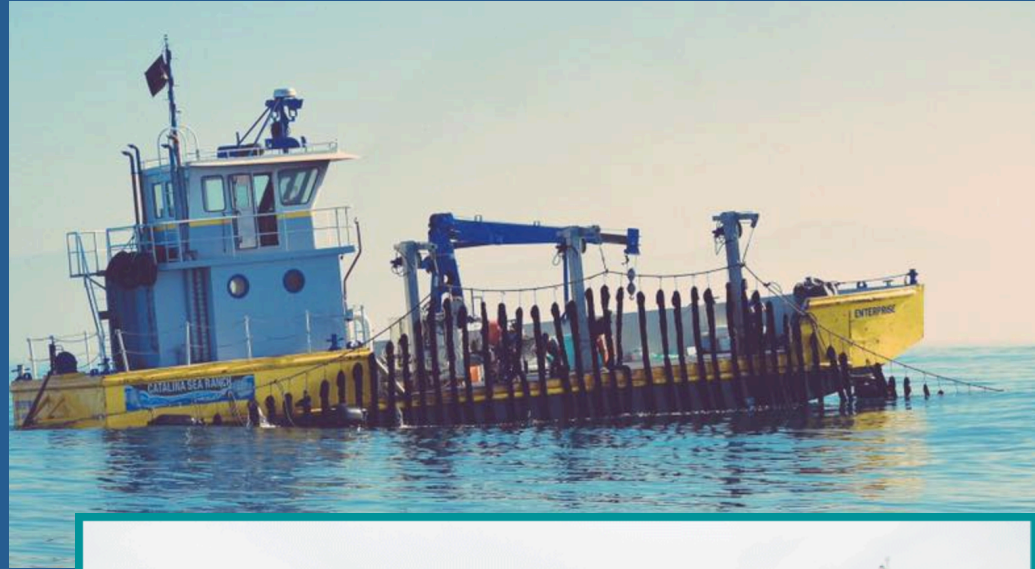
Business Planning for Offshore Farm

- Capital Costs – Boat
 - Used, Retrofit, or New
 - Specialty equipment for boat
 - hauler, davits, gantry set-up
 - Crane, knuckle boom, starwheels



Mussel Farming Boats

Catalina Sea Ranch



Offshore Shellfish Ltd



Mussel growing technology choices

Work boat requirements and design



Crane and knuckle boom



Star Wheels on Rail

Capital Costs – Support Equipment

- **To own, to contract out or to share (Co-op)?**
- Stripper, washing, cleaning (mussels and rope)
- Declumper/grader for seed AND market
- Socking Machine
- Debyssing machine
- Bagging and weighing
- **Consider cost of shore facilities and storage**

Farm and Process Equipment – Low End ~\$35,000



Spanish socking machine

Spanish Declumper and Grader Machines
1 ton per hour capacity?



Farm and Process Equipment – Hi End ~\$150,000



ANSCO NZ socking machine

NZ Declumper and Grader Machines
2 to 3 tons per hour capacity



Operating Costs

- Boat and vehicle costs (insurance, fuel etc.)
- Overhead – admin., insurance, depreciation etc.
- Labor and supplies –
 - Seed and special handling (spring and fall)
 - Socking (within weeks after each harvest)
 - Harvest (once or twice a week)
 - Processing or Post-harvest handling
 - Twice monthly maintenance, monitoring adding buoys, checking for wear

What do mussel farmers monitor?

- Growth, meat yield
- Line tension and buoyancy
- Line wear and tear
- Fouling
- Predation (especially sea ducks)
- Protected species (presence / absence)

Assumptions in Farm Budgets

- Start-up with 10' “droppers” (~ 26') every 2 m
- Harvest 5# of product per foot to start
- Graduate to 8# per foot with expansion to 36 LL
- Installation cost drop 20%/LL with expansion
- Sale price drops from \$2.50 to \$2.00/lb at scale
- 2 to 4 lines are used just for growing seed
- Salaries average \$65K/yr, Fuel is \$3/gal

Mussel Farm Budget - 12 Longlines

100,000 lbs/yr production	Investment
Investment in longlines (200 m each)	\$103,000
<i>Seeding, harvesting equipment</i>	\$35,000
<i>Support vessel retrofit ($\geq 50'$)</i>	\$75,000
TOTAL FIXED CAPITAL INVESTMENT	\$213,000
<u>FARMING COSTS</u>	
Annual cost of seed (occupies 2 lines)	\$15,000
Annual payroll cost	\$43,000
Annual insurance cost	\$4,000
Annual cost of operations	\$46,000
Annual farm office / administration	\$8,000
Depreciation (10% of capital investment)	\$21,000
Farm profit margin (10%)	\$14,000
TOTAL FARMING COSTS	\$152,000
Cost of production (bulk processed)	\$1.52/lb

Mussel Farm Budget - 12 Longlines

Including POST HARVEST COSTS	Annual cost
Raw material cost into processing - \$1.52/lb	\$152,000
Processing cost per finished lb (\$0.03)	\$3,0000
Packaging cost per finished lb (\$0.03)	\$3,0000
Finished goods production cost	\$158,000
Selling cost, gen. admin, 7.5% of production cost	\$12,000
Freight to wholesaler (\$0.075 per lb)	\$7,0000
Delivered cost – wholesaler - \$ 1.78 / lb	\$177,000
Selling price to wholesaler - \$2.50 / lb	\$250,000
Revenue minus costs	\$72,000
Total profit (Farm (\$14K) + Process/Sales)	\$86,000
<i>Return on investment</i>	<i>24%</i>

Mussel Farm Budget - 36 Longlines

500,000 lb/yr production	Investment
Investment in longlines (200 m each)	\$252,000
<i>Seeding, harvesting, bulk process equipment</i>	\$150,000
<i>Support vessel</i>	\$400,000
TOTAL FIXED CAPITAL INVESTMENT	\$802,000
<u>FARMING COSTS</u>	<u>Annual cost</u>
Annual cost of seed (occupy 4 lines)	\$46,000
Annual payroll cost	\$162,000
Annual insurance cost	\$16,000
Annual cost of operations	\$179,000
Annual farm office / administration	\$15,000
Depreciation (10% of capital investment)	\$80,000
Farm profit margin (10%)	\$50,000
TOTAL FARMING COSTS	\$548,000
Cost of production (bulk processed)	\$ 1.10/lb

Mussel Farm Budget - 36 Longlines

Including POST HARVEST COSTS	Annual cost
Raw material cost into processing - \$1.10/lb	\$548,000
Delivered cost – wholesaler - \$ 1.28 / lb	\$640,000
Selling price to wholesaler - \$2.00 / lb	\$1,000,000
Revenue minus costs	\$358,000
Total profit (Farm (\$50K) + Process/Sale)	\$408,000
<i>Return on investment</i>	<i>30%</i>

What isn't covered in detail

- Marine lease fees
- Docking or landing fees
- Compliance and environmental monitoring
- Crop insurance
- *Plug figure of \$17K - \$28K/yr. used for these*
- **HAB seasonal closures and cash flow issues**

Cooperative Advantages*

- Volume purchasing may reduce costs
 - Capital goods, insurance, seed
- Enhanced bargaining power with buyers
- Access to new and larger markets
- Economy of scale in processing, value-added

*Business Planning Handbook for the Ocean Aquaculture of Blue Mussels, Hoagland et al 2003

Conclusions

- Start-up at appropriate “learning” scale with technology suited to site conditions.
- Use proven technology
- Regularly monitor longlines
- Take time to learn and adapt to your conditions
- Consider training opportunities
- Understand the market