Production Work Group Session 1: Big-Picture Challenges & Opportunities

Lack of information/guidance about farm economics
- Estimating investment
- Scaling farms appropriately for markets
- Lease consolidation—what’s the risk?

Inefficiencies
- Mechanization
- Remote management
- Optimizing space utilization

Seed Stock
- Availability (facility bottleneck)
- Cost (e.g. 20% of ROI)
- Supplying remote growers
- Understanding propagation techniques
- Reliance on wild seed stock Seed bank?
- Sourcing sori
  - Geography & genetics—what’s important for diversity? Genetic diversity study
  - Science-based BMPs
  - Wild strains don’t necessarily perform well in farm setting
  - What’s the potential for selective breeding? Desired traits: site-specific stocks; high performance; temperature resilience (see Quigley & Brawley)

Site Selection
- Lack of standards and guidance
- NOAA ‘National AquaMapper’ too high level & doesn’t take key social factors into account; Greenwave workbook better? Freely available?
- Test strings for site evaluation (e.g. LPA license)
- Maine: number of LPAs exceeding management capacity (perception that DMR has “lost control”)
- Conflict with user groups (real & perceived; seasonality makes it possible to co-exist)

Regulators
- Agencies lack capacity to process & manage
- Lack of agency “ownership”
- Misinformed
  - Need first-hand exposure to farming (spend a week on a farm)
  - Industry advisory board for USACE
- Expert review of farm applications (e.g. NOAA engineer)
- Multi-state industry stakeholder groups to address regional inconsistencies

Gear & Operations
Alternatives to ‘one-size-fits-all’ approach (design “typologies”)
‘Nimble’ gear--easy to deploy/recover
Gear failure
Practicality of integrating seaweed into existing shellfish operations
Industrial safety

Public Relations
Misperceptions
Lack of social license (farmers need to be able to communicate their ‘why’ and public benefits of farming)
Insufficient government-funded industry support
Improved practices for ‘lighter footprint’ (to reduce NIMBYism)

Monitoring capabilities (added during Session 2)
Options to gain better data
Shared or individual use
WA state: ORCA buoy; Live Ocean; IOOS/NANOOS. Also NOAA NCCOS (funding & apps/tools)
Are HABs a seaweed issue?
Can seaweeds help with HABs? (Stonybrook/NYS study)
Automated monitoring of site

Climate Change! (added during Session 2)

Challenges--Card Tally
Seed Availability/Cost (7)
Site Selection & Cost Evaluation (6)
User Group Conflicts/Public Buy-in (5)
Sorus Sourcing (4)
Market Type/Availability (4)
Regulation or Permitting (3)
Line Sources/Enrichment/Gear Challenges (3)
Processors/Infrastructure (2)
Labor (2)
Where to sell (1)
Tech Support--Best Practices (1)
Efficient Use of Space (1)
Limited Harvest Season (1)
Farm Production/Ecosystem Services Balance (1)
Funding (1)
Changing Environment (1)

Production Work Group Session 2: Identifying Priorities, Goals & Objectives
Dot voting exercise to prioritize Short-term/Long-term Goals

**Short-term**
- Seed Stock Availability (5) + Seed costs (4) + String Alternatives (3) = 12
- Lack of Site Selection Standards (3)
- Deployment/Recovery of gear (5) + Inefficiencies of production (5) = 10
- Integrating with Shellfish (5)
- Industrial Safety (2)
- Monitoring capabilities (4)
- Lack of social license (4) + Nimbyism (1) = 5
- Actionable monitoring (4)
- Lack of ownership by agencies (4)
- Gov’t funding (3)

**Long-term**
- Climate Change (13)
- Real + perceived user group conflicts (12)
- Selective Breeding (5)
- Can seaweeds help with HABs (4)
- Farm Economics (3)
- Alternative to “one-size-fits-all” approach (3)
- Reliance on wild seed (2)
- Monitoring (2)
- Agencies lack capacity (2)
- Automated monitoring (2)
- NOAA Aquamapper (1)
- Actionable monitoring (1)

Top Short- and Long-term Goals & Objectives (S=short-term; M=medium; L=long)

**Goal:** Improve Seed Stock Supply
- Objective: Increase number of facilities - **Short-term**
- Objective: Increase capacity of facilities - **Medium-term**
- Objective: Workforce development - **Medium- to Long-term**
- Objective: Communicating with growers (look to shellfish seed model) - ?

**Goal:** Develop and Deploy Monitoring
- Objective: Integrate with existing information delivery platform (e.g. NANOOS)
  - Task #1: Identify monitoring priorities - **S**
  - Task #2: Identify programs/platforms to disseminate monitoring data - **M**

**Goal:** Improve Guidance for Site Selection/Farm Design
Objective: Disseminate beta version of GreenWave workbook (question: how transferrable is the content? Is it appropriate for all seaweed-farming regions?) - Super-short (e.g. next week)
    Task: 30-minute workbook training webinar for Production Work Group, who will provide feedback on beta version.
Objective: Standardizing industry nomenclature & procedures (growers-->regulators) - S
Objective: Compile? farm infrastructure guidance - M

Goal: Gear & Operation…?
    Objective/Goal: Improve efficiency
    Objective/Task: develop anti-fouling BMPs to extend harvest season - ?

Goal: Make Permitting as painless as possible!
    Objective: Export Maine “one-stop-shop” process - M-L
    Task: Sea Grant-facilitated grower/regulator ‘workshop’

Goal: Increase resilience/adaptation climate change
    Objective: Fund/advocate for research

Goal: Reduce conflicts with User Groups
    Objective: Identify economic & environmental benefits

**Goals chosen as priority:**

Goal: Improve Seed Stock Supply
    Objective: Identify number of nursery facilities and share list with growers - S
    Task: gather current commercial suppliers to share and make a list similar to East Coast Shellfish Growers Assn (ECSGA) hatchery list
Objective: Increase capacity of facilities - M
    Task: evaluate current training videos available
Objective: Workforce development - M-L
    Task: identify existing opportunities and capacity
Objective: Further research and develop seed supply - M-L
    Task: Advocate for funding for seaweed seed supply issues

Goal: Improve Guidance for Site Selection/Farm Design
    Objective: Disseminate GreenWave workbook (beta version) - Super-short (next week)
    Task: 30-minute training webinar for Production Work Group
    Task: Evaluate GreenWave workbook
Objective: Standardizing industry nomenclature & procedures (growers-->regulators) - S
    Task: review current nomenclature used to describe gear and operations and suggest a standardized system of nomenclature for clarity
Objective: Compile updated farm infrastructure guidance - M
Task: Find funding to update seaweed handbooks such as those produced by CTSG and Ocean Approved with most up to date practices for sharing through the seaweed hub

Goal: **Improve Efficiency of Gear & Operations**
   - Objective: Develop technology or methodology to improve efficiency of farms - M
   - Task: Setup a searchable electronic platform to share current research results and allow for discussion to improve ability of farms and researchers to learn from one another

Workgroup process
   - Bimonthly web/phone based meetings
   - More frequent electronic communication as necessary or as info becomes available

Work Plan - List of Tasks
   - Task: gather current commercial suppliers to share and make a list similar to East Coast Shellfish Growers Assn. hatchery list
   - Task: evaluate current training videos available
   - Task: identify existing opportunities and capacity
   - Task: Advocate for funding for seaweed seed supply issues
   - Task: 30-minute training webinar for Production Work Group
   - Task: Evaluate GreenWave workbook
   - Task: review current nomenclature used to describe gear and operations and suggest a standardized system of nomenclature for clarity
   - Task: Setup a searchable electronic platform to share current research results and allow for discussion to improve ability of farms and researchers to learn from one another