AMOY Working Group 2018
Breeding Metrics Survey Results

22 responses: CT, FL, LA, MA, MD, NC, NJ, NY, SC, TX, VA

- List of established AMOYWG metrics with definitions and data sheet request
- Two questions: do you collect this metric/do you use AMOYWG definition
- Responses from Fed, State, Local Government, Nonprofit
- Most are reporting this info to AMOYWG, annual report, project report, etc.

Territorial pair

Pair that creates scrapes, engages in agonistic behavior with other AMOY

- **14 yes/14 yes**
- **6 no**

Breeding Pair

Pair that lays at least one egg

- **22 yes/19 yes***

*** Are including territorial pairs as a breeding pair**

Productivity

No. chicks fledged/No. breeding pairs

- **21 yes/20 yes***
- **1 no**

***Defined breeding pair to include territorial pairs**

Nests monitored

Number of nests monitored

- **20 yes/20 yes**
- **1 no***

***nest monitored=breeding pairs**

Nests abandoned

Number of nests abandoned

- **20 yes/ 20 yes**
- **2 no***

***1 needed a clear definition of abandoned**

Nests with partial clutch loss

Nests that lost at least one egg but not entire clutch

- **16 yes/16 yes**
- **6 no***

***several respondents did not think this was an important metric**

Nests with unknown fate

Number of nests with unknown fate

- **17 yes/17 yes**
- **4 no**

Source of nest loss if known

- **20 yes**
- **2 no**

Hatched

Out of shell - pipping/starred eggs are not considered hatched

- **21 yes/20 yes***
- **1 no**

***Considered pipping eggs hatched**

Hatching success (apparent)

Nests hatched/nests found (at least one egg hatched=hatched). Specify nests with known fates

- **19 yes/18 yes***
- **3 no**

***Hatching success is the # of individual eggs hatched divided by the # of eggs laid**

Hatching success (adjusted)

Probability of a nest surviving over a given interval (usually a day or average incubation period)

- **4 yes/3 yes**
- **18 no**

Broods hatched

At least one egg hatched

- **17 yes/ 16 yes***

*** Labels as “nest hatched” instead of brood**

Chick survival (apparent)

No. chicks fledged/No. chicks hatched

- **18 yes/18 yes**
- **4 no**

Chick survival (adjusted)

Probability of a chick surviving over a given interval

- **3 yes/3 yes**
- **19 no**

Source of chick loss if known

- **17 yes**
- **5 no**

Majority of respondents are struggling with this

Fledging

Survival to 35 days or sustained flight of 100 m. 45 days for management

- **22 yes/20 yes***

***40 days or sustained flight**

***Sustained flight only**

***Several only use the 35 day and then other options for management**

Broods fledged

At least one chick fledged

- **18 yes/18 yes**
- **4 no**

Failed broods

Number of broods that completely fail

- **17 yes/ 15 yes***
- **5 no**

***Definition was unclear**

***Evaluated in brood success**

Broods with unknown fate

Number of broods with unknown fate as to fail or fledge

- **16 yes/15 yes***
- **6 no**

*** needs clarification for sites where monitoring is less than ideal**

Site visit frequency

Ideally 2x a week for best resolution for nest and chick fates. May not be feasible in more remote areas.

- **19 yes/12 yes***
- **3 no***

***Most "yes" could survey more than twice a week and most "no" could only do 1x/week or less**

Monitoring window

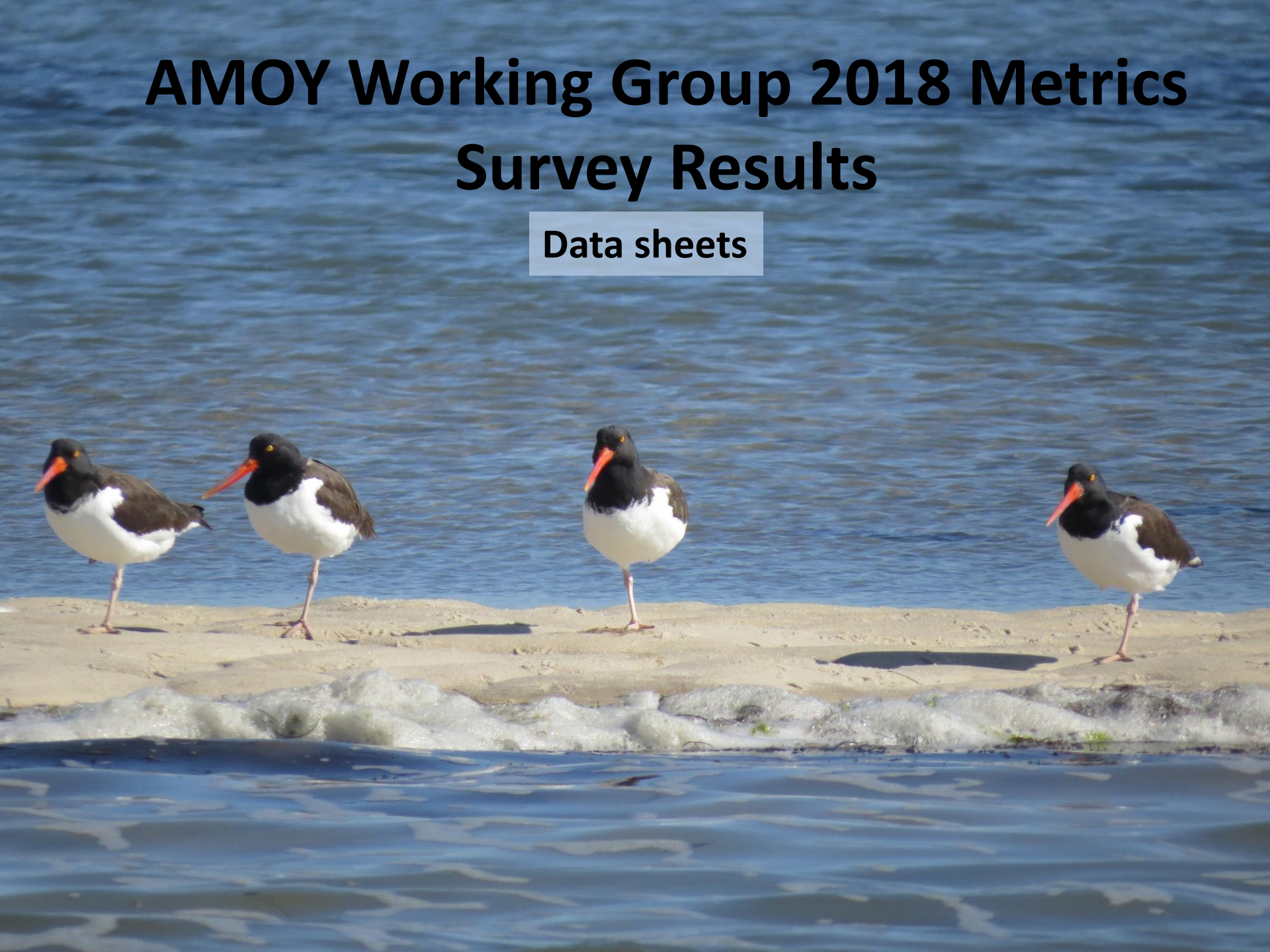
Dates when monitoring began and ended for the season

- **19 yes/19 yes**
- **3 no**

Metric	> 90% conformity among survey participants	> 50% and < 90% conformity among survey participants	< 50% conformity among survey participants
Territorial pair		✓	
Breeding pair	✓		
Productivity	✓		
Nests monitored	✓		
Nests abandoned	✓		
Nests partial clutch loss		✓	
Nests unk fate		✓	
Source of nest loss if known	✓		
Hatched	✓		
Hatch success APP	✓		
Hatch success ADJ			✓
Broods hatched		✓	
Chick survival APP		✓	
Chick survival ADJ			✓
Source of chick loss if known		✓	
Fledge	✓		
Broods fledged		✓	
Failed broods		✓	
Broods unk fate		✓	
Site visit frequency		✓	
Monitoring window		✓	

AMOY Working Group 2018 Metrics Survey Results

Data sheets



Data recorded from data sheets

- Band information
- Site description
- Nest habitat
- Nest substrate
- Nest GPS
- Dates for:
    - survey
    - nest/brood discovered
    - expected hatch
    - egg failure
    - chick failure
    - last seen incubating
    - nest fate determined
    - fledged or estimated fledged
    - chicks last seen unfledged if chicks do not fledge
    - nest completion
    - estimated clutch initiation
    - egg loss
    - begin hatch monitoring
    - actual hatch date
    - each egg detected
- Pair ID, #, etc.
- Nest ID, #, etc.
- Attempt No
- Site name
- # eggs/chicks when discovered
- # eggs hatch within a clutch

Data recorded from data sheets

- Lifeguard present within 50 m of nest
- Active use 50 m within nest (running, jogging, etc) and different categories of abundance
- Passive use 50 m within a nest (sunbathing, etc) and different categories of abundance
- Unleashed dogs 50 m within a nest and different categories of abundance
- Leashed dogs 50 m within a nest and different categories of abundance
- Mechanical beach scraping 50 m within a nest and different categories of abundance
- Symbolic fencing yes/no, installed prior to nesting yes/no
- Nesting area closed to public during nesting season
- Signs posted in nesting area during nesting season
- Renest?
- Human tracks if observed (distance to nest not given on data sheet)
- Was nest completed
- # eggs hatched
- # eggs unhatched
- # dead chicks found
- age at fledging
- Nest marked yes/no and with ?
- Adult present yes/no
- Evidence of predator sign observed within 10 m of nest:cat, coyote, skunk, fox, raccoon, gull, crow, raptor, ghost crab
- Max number of eggs in completed clutch
- Distance from nest to MHW, also Distance from water generally
- Distance from nest to vegetation
- Number of nonbreeding adults: number of adults that are do not participate in breeding/nesting at a given site. We do not have information on whether or not they tried to breed at some point. Some of these adults may be territorial pairs.
- No chicks lost and cause
- Nest found after hatching?
- Temp, Wind, Weather, Tide

Data recorded from data sheets

- Nest attempts=Average number of nests attempts per pair
- Vegetation density: None, < 20%, 20-90%, >90%
- Nest on wet sand?
- NEST HABITAT (circle one): OPEN BEACH PRIMARY DUNE INTERDUNE WASHOVER MARSH
- NEST SUBSTRATE (circle one): FINE SAND COURSE SAND GRAVEL COBBLE
- Habitat: artificial, shoreline, flats, tidal/ephemeral pond, beach/dunes, shell rake, spoil island
- ave clutch size: # eggs laid/# nest attempts
- total nest attempts/pairs
- total number eggs laid
- eggs hatched/pair: # individual eggs hatched/# nest attempts
- fledging success: # of chicks fledged/# chicks hatched
- # dogs leashed, unleashed within 200 ft of chicks
- beach raking within 300 ft of chicks
- wet wrack within 300 ft of chicks, and abundant or sparse
- Disturbance codes and track codes for chicks
- Site posted: signs, signs and rope, no
- Nest disturbance: walker/runner/cyclist, dog leashed, unleashed, kite surfer, vehicle, non-powered watercraft, powered watercraft, ghost crab, avian predator, aircraft, unk, other
- Tracks within 30 ft of nest: dog/canid, vehicle, raccoon, snake, human, ghost crab, cats, unk, other
- # leashed and unleashed dogs within 200 ft of nest
- beach raking within 300 ft of nest, abundant or sparse
- "Microhabitat: Using a 1m tape measure, stick or appropriately measured markings on your tripod, visually assess cover types in a 1m radius:% cover bare sand, vegetation, shell hash, woody"
- nest distance to water body and water body type
- distance of veg to nest, veg species and height, veg abundance: sparse, moderate dense defined
- distance of nearest dune to nest and height of dune
- distance of nest to primary dune line
- location of nest relative to dunes: bay, front, dune pocket, on dune, behind dune

Data recorded from data sheets

- habitat: beach, blowout, bayside flat, coastal grassland, dredge spoil, dunes, dunelets, interdune, oysterbar, sandbar, spit, swale, washover
- Distance to nearest access point and type of access point
- Nest distance to rope line
- Distance to vehicle track and vehicle type
- Distance traveled by brood to foraging area
- Foraging habitat posted
- Fish crow, gull-billed tern, laughing gull observed in brood area
- "Brood Forage Type: Beach/Dunes, Bay Flat, Bay Shore, EphemeralPool, Gulf Shore, Inlet Spit, Lagoon, Lake/Creek Outlet, Oyster/shell rake,Sand Bar, Swale, Tidal, Tidal Flat, Vegetation. "
- "Brood Vegetation: Roughly assign the vegetation in the general locationswhere the brood was observed foraging"
- "Activity Conducted: Fencing (F), Surveillance (Su), Monitoring (FSA only) (M),Stewarding (St)"
- Posting adjustment reason: Line-down (LD), Vandalism (V), Storm Surge (SS), Unknown (UNK), Nesting outside posting area (NOP)
- Record the Tracks(observed within 10m & 11-30m of a nest) – dog (D), coyote (CO), red fox (RF), gray fox (GF), raccoon (R), opossum (O), cat (CA), laughing gull (LG), great blue heron (GBHE), people (P), ghost crab (GC), vehicle (V), other (O) (if other describe)
- "Disturbances- Caused birds to flush (list all that apply): Walker/runner/cyclist (WALK), Dog-leashed (DOGL), Dog-unleashed (DOGU), Vehicle (VEH), non-powered watercraft (NPWC), powered watercraft (PWC), beach sports (BS), ghost crab (CRAB), fish crow (FICR), gull-billed tern (GBTE), laughing gull (LAGU), avian predator (AVPR)-describe species, aircraft (AIR),motorized paragliders (MP), unknown (UNK), other (if other describe)"
- "Record if nests, brood-rearing areas orpre-nesting (territorial pairs) locations are posted or if broods are using chick shelters"
- "Attentive Adult: Adult actively engaged in breeding behavior(i.e., incubating, brood-rearing, etc.). Brood-rearing includes vigilance,escorting, brooding, etc."
- "For nests and broods, if there is wet wrack (fresh wrack), record if it is sparse(S) or abundant (A), if no wrack is present write none (N)"
- "Hatching Rate: The proportion of eggs in successful nests that hatch "

U.S. Fish and Wildlife Service
U.S. Department of the Interior

National Wildlife Refuge System

Regional Protocol Framework for the Inventory and Monitoring of Breeding Atlantic Coast Piping Plovers

Southeast and Northeast Regions

Version 1.0 **Month Year**

USFWS How to Develop Survey Protocols:

- Protocol introduction
- Sampling design
- Field methods
- Data management and analysis
- Reporting
- Personnel requirements and training
- Operational requirements
- References