

Karen C. Drayer Wildlife Health Center





### THE USE OF INFRARED THERMOGRAPHY TECHNOLOGY IN OILED WILDLIFE RESEARCH AND RESPONSE

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### OILED WILDLIFE CARE NETWORK



**Oiled Wildlife Care Network** 

UC Davis Wildlife Health Center



#### **"BEST ACHIEVABLE CAPTURE AND CARE OF OILED WILDLIFE"**

### WHAT EFFECT DOES OIL HAVE ON WILDLIFE?

- Internal Effects
- External Effects:
  - Loss of waterproofing

**DEATH** (if no intervention)

Heat Loss



- Increased metabolic rate and use of energy
- Decreased ability to forage
- Increased risk of predation
- Increased debilitation

### ANIMALS MOST AT RISK OF OILING EFFECTS

- Seabirds
- Marine Mammals
  - Fur Seals
  - Sea Otters







# TREATMENT OF OILED WILDLIFE

### Reverse effects of oiling by:

- ✓ Supportive care
- ✓ Removal of oil
- ✓ Care until release



www.alamy.com - C2BPT2

### PROCESS IS STRESSFUL TO WILD ANIMALS

- Every aspect of response is stressful
- Stress may increase rehab time (detrimental to animal)
- Cannot eliminate stress completely
- Goal is to minimize stress



### IMPORTANT TO RESTORE WATERPROOFING

- Once oil removed
- Treat any external/internal injuries
- Provide nutrition and care
- In animals that depend on waterproof feathers or fur:
  - Restoring waterproofing is critical



# ASSESSING WATERPROOFING

- Visual examination
- Scoring
- Issues:
  - ✓ Somewhat subjective
  - ✓ Takes time
  - ✓ Labor-intensive

✓ Increases stress every time animal handled



# **TECHNOLOGY!** =INFRARED THERMOGRAPHIC CAMERA

- Not "new" technology
- Expensive (\$50K)
- Use has been limited (so far) in oiled wildlife rehabilitation
- OWCN shares camera with MWVCRC (FLIR ThermaCAM S65) – purchased in 2006



### INFRARED THERMOGRAPHY

 Photographic process where the invisible spectrum of light can be visualized and quantified (= heat loss)



#### WHY IS THIS IMPORTANT?

Can calculate T of an object from a distance (proxy for waterproofing assessment):

- Decreases handling time
- May decrease stress



### THERMOGRAPHY USE IN SEABIRD RESEARCH

- Use of thermography for improving oiled seabird rehabilitation (Nevins & Young 2012; Nevins, Oats & Miller 2013 - OWCN-funded and CDFW-OSPR SSEP funded projects)
- Evaluation of post-op healing in Western Grebes (Gaydos et al. 2011)
- The effects of dispersant and chemically dispersed oil on Common Murres

(Elias, Whitmer & Ziccardi, in prep)

### USE IN OILED SEABIRD REHABILITATION

• Use of thermography to assess waterproofing and improve oiled seabird rehabilitation



Nevins, Oates & Miller 2013

COMPARISON OF TRADITIONAL VS. THERMOGRAPHY METHODS

- Comparison of thermography images and physical examination (Nevins & Young, 2012, Proceedings of the EOW)
- Agreement between the two = 75%
- 28% false negatives (handler said bird was waterproof, not confirmed by thermograph)

**CONSERVATIVE ASSESSMENT** 



USE OF THERMOGRAPHY TO ASSESS POST-OP HEALING IN WESTERN GREBES

• Evaluation of a modified surgical technique for implanting Western Grebes with implanted transmitters with a percutaneous antennae





Gaydos et al. 2011, J. of Zoo and Wildlife Medicine 42(3): 414-425

EFFECTS OF DISPERSANT AND CHEMICALLY DISPERSED OIL ON COMMON MURRES

- Expose birds to dispersant and chemically dispersed oil
- Determine if chemical dispersant and/or chemically dispersed oil affects the waterproofing of live Common Murres:

>Post-exposure

#### > Post-washing (traditional and thermography methods)



Rebecca Duerr/UC Davis

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#### USE OF IR TECHNOLOGY ON "OLIVE"

- First day post-wash:
- Placed in warm pool for 4 hours
- Evidence of heat loss (100%)



- 5<sup>th</sup> day post-wash:
- Heat loss 10% in belly area



### POTENTIAL USE OF THERMOGRAPHY

Beneficial for minimizing handling (especially in pools post-wash) to evaluate waterproofing; however:

- Sunlight, wind speed, water T, handler's hands can all affect thermograph data
- Combine with behavioral observations?
- Further evaluation needed, especially during oiling events



### CONCLUSIONS

- Infrared thermography has utility in oiled seabird and marine mammal research and rehabilitation
- New camera technology may have improved accuracy
- Opportunities for further testing during oiling events will be important for further testing of technique
- OWCN "best achievable capture and care of oiled wildlife"



### THANKS FOR LISTENING! QUESTIONS?

