>>: HELLO AND WELCOME TO THE SECOND WIND ENERGY BROADCAST.
I AM CHRISTY JOHNSON-HUGHES OF THE U.S. FISH AND WILDLIFE SERVICE AND THIS IS THE SECOND BROADCASTS IN THE WIND ENERGY SERIES.
WE ARE COMING TO YOU FROM THE LOVELY NATIONAL CONSERVATION TRAINING CENTER STUDIO ALONG THE POTOMAC RIVER.
I WOULD LIKE TO HANDLE A FEW HOUSEKEEPING ITEMS BEFORE WE GET STARTED.
AS YOU WILL SEE ON YOUR SCREEN, IF YOU ARE JOINING US OVER THE WEB, A LOVELY PICTURE OF A DEER AND A COUPLE OF OTHER ITEMS ON THEIR AND THIS SEGMENT OF THE PROGRAM WE WILL BE HOLDING A ROUNDTABLE DISCUSSION AND WE WILL BE INVITING QUESTIONS FROM OUR AUDIENCE.
IF YOU WOULD LIKE TO ASK US A QUESTION OR PERHAPS COMMENTS, PLEASE TYPE IN YOUR QUESTION OR COMMENT INTO THE CHAT BOX AND THEN CLICK "SAY."
IF YOU ARE HAVING ANY ISSUES WITH THE RESOLUTION, ON YOUR SCREEN, THEN YOU WILL NOTICE JUST TO THE BOTTOM OF THE PHOTO WITH THE DEER THERE IS A HIGH BUTTON, YOU CAN CHANGE THAT TOO LOW AND THAT MIGHT HELP WITH ANY RESOLUTION PROBLEMS YOU ARE HAVING.
SO AGAIN ANY COMMENTS OR QUESTIONS, PLEASE TYPE THEM INTO THE CHAT BOX AND CLICK "SAY."
AND WE WILL GET TO THAT DURING THE ROUNDTABLE DISCUSSION.
FOR RIGHT NOW, WHAT I WOULD LIKE TO DO IS GO TO OUR FIRST GUEST.
WE WILL HAVE THREE GUESTS TOTAL

AND WE WILL ALSO HAVE A ROUNDTABLE DISCUSSION AND WHAT WE WOULD LIKE TO DO IS GO TO OUR FIRST GUEST, DR. DALE STRICKLAND AND DALE WILL BE TALKING TO US ABOUT A STUDY THAT WAS PERFORMED AT AN EXISTING WIND FACILITY, MOUNT STORM WIND FACILITY.
DALE, WELCOME TO OUR WIND ENERGY BROADCAST.
>>DALE STRICKLAND: I'M HAPPY TO BE HERE.
>>CHRISTY JOHNSON-HUGHES: HE IS THE PRESIDENT AND SENIOR ECOLOGIST WITH WEST.
AND DALE HAS GOTTEN HIS PH.D IN ZOOLOGY FROM THE UNIVERSITY OF WYOMING.
IS A MEMBER OF THE NATIONAL WIND COORDINATING COMMITTEES, WILD LIFE WORKING GROUP AND HE HAS SERVED AS A KEY TECHNICAL ADVISER TO OUR FEDERAL ADVISORY COMMITTEE AND HAS HELPED US TO DEVELOP THE FISH AND WILDLIFE SERVICE IS LAND-BASED WIND ENERGY GUIDELINES.
SO DALE, I WILL LET YOU TALK A LITTLE BIT ABOUT MOUNT STORM.
>>DALE STRICKLAND: THANKS CHRISTY AND THE TITLE OF THE TALK IS A RETROSPECTIVE TIERED ENVIRONMENTAL ASSESSMENT OF MOUNT STORM WIND ENERGY FACILITY, WEST VIRGINIA.
I WOULD LIKE TO START OFF BY THANKING THE CO-AUTHORS OF THIS PAPER.
THE OBJECTIVES OF THIS STUDY WERE TO PROVIDE A REAL-WORLD EXAMPLE OF THE USE OF THE FISH AND WILDLIFE SERVICE GUIDELINES TO INDICATE HOW USE OF THIS TIERED ASSESSMENT FRAMEWORK

MIGHT HAVE ALTERED THE OUTPUTS OF PREVIOUSLY UNDERTAKEN WHILE LIFE ASSESSMENT OF MOUNT STORM AND ALSO TO ASSESS THE BENEFITS OF THE TIERED ECOLOGICAL ASSESSMENT FRAMEWORK.
SO THOSE WERE THE OBJECTIVES OF OUR STUDY.
NOW WE WOULD LIKE TO SHOW YOU SOME VIDEO OF THE CURRENT SITE AND I WILL EXPLAIN HOW THE SITE IS CONFIGURED SO THAT YOU HAVE AN UNDERSTANDING OF WHAT WE WERE TRYING -- WHAT WE ARE EVALUATING.
THE MOUNT STORM WIND ENERGY FACILITY IS LOCATED IN WEST VIRGINIA.
THE SITE WAS MAINLY USED FOR LOGGING AND STRIP MINING AND THERE'S ALSO AN EXISTING COAL-FIRED POWER PLANT IN THE LOCATION.
THE PROJECT IS PROPOSED WAS HUNDRED 32 TURBINES ON A STRIP OF LAND APPROXIMATELY A TENTH CIR. ON THAT ARE WIDE AND 22 1/2 KILOMETERS WIDE ALONG THE ALLEGHENY FRONT.
THE PRE- CONSTRUCTION WORK BEGAN IN 2004 AND THE POST- CONSTRUCTION STUDIES WERE COMPLETED IN 2011.
THE BEGINNING OF THE PROJECT WERE THE TIER ONE STUDIES.
THE TIER ONE HAS THREE OBJECTIVES, THREE POTENTIAL OBJECTIVES.
THE OBJECTIVES THAT WE SELECTED WAS OBJECTIVE NUMBER TWO, THAT IS TO SCREEN A SET OF POTENTIAL SITES TO EMPLOYED THOSE WITH HIGH HABITAT VALUE.
THE DEVELOPER DIVIDED THE PROPOSED PROJECT AREA INTO CENTRAL, NORTHERN, AND

SOUTHERN PHASES.
AND THE DEVELOPER PROPOSED CONSTRUCTION OF THE CENTRAL FACE FIRST, THEN THE NORTHERN AND SOUTHERN PHASES.
SO IN OUR OWN TIER ONE RISK ASSESSMENT, WE'VE LOOKED AT THOSE THREE PHASES AS THREE POTENTIAL PROJECTS.
IN TIER 2, THE FIRST STUDY WAS A PHASE ONE AVIAN RISK ASSESSMENT CONDUCTED IN 2002 BY
DR. CANTERBURY AND WE ENLISTED THE FISH AND WILDLIFE SERVICE AND THE DNR AND THEY IDENTIFIED POTENTIAL SPECIES OF CONCERNS REQUIRING TIER 2 OR TIER THREE STUDIES.
THEY ALSO IDENTIFIED A HABITAT FEATURE CALLED THE HELMICK RUN BOG WHICH ULTIMATELY WAS AVOIDED BY THE PROJECT BUT THE RISK WAS NOT ASSESSED IN THE DOCUMENT WE REVIEWED AS SUGGESTED BY THE WIND ENERGY GUIDELINES.
THERE ARE ALSO TO THREATENED AND INDEED SHOULD -- ENDANGERED BAT SPECIES IDENTIFIED THAT THEIR CONCLUSION WAS THEY WERE AT LOW RISK FOR THE PROJECT.
SO TIER 3 THEN WAS A SET OF STUDIES DESIGNED TO GET MORE INFORMATION ABOUT THE WAY THE SITE WAS USED BY WILDLIFE IN PARTICULAR BIRDS AND SO THE ORANGE OUTLINE IS ROUGHLY THE PROJECT SITE.
THERE ARE A NUMBER OF DOTS THROUGHOUT THE LENGTH OF THE PROJECT AND THOSE ARE THE AVIAN POINT COUNT LOCATIONS THAT WERE USED IN THE PRE- CONSTRUCTION SURVEYS.
WE ALSO DID A FAIRLY EXTENSIVE

RADAR EVALUATION OF A
HYPOTHESIS THAT HAS THREE
MIGRAINES AND THEY WOULD USE
THAT RIDGE AS A LEADING EDGE.
AND SO WE HAD FIVE DIFFERENT
RADAR LOCATIONS, THE ONE IN THE
CENTER WAS FIXED AND THE OTHER
4 WE ROTATED UNITS AROUND TO
LOOK AT HOW THE BIRDS REACTED
TO THE RIDGE.
AT THE END OF THE TIER THREE DATA
COLLECTION AND ANALYSIS, THE
WIND ENERGY GUIDELINES CALLED
FOR A DECISION PROCESS AND
OUTCOME AND IN THE PROCESS AND
OUTCOME WE CONCLUDED THAT
MOST OF THE SPECIES COULD BE
ELIMINATED BASED ON THE
ABUNDANCE OR THE PROJECT
DESIGN.
THE TIER 3 STUDIES, THE
INFORMATION ALLOWED OUR
PREDICTION THAT THE TELL THESE
WOULD BE LOW AND SIMILAR TO
THOSE IN THE REGION.
THERE WAS NO EVIDENCE
SUPPORTING THIS LEADING EDGE
HYPOTHESIS FOR MIGRATING BIRDS.
IN OTHER WORDS THE BIRDS DID NOT
APPEAR TO ADJUST THEIR FLIGHT
PATTERN IN ADJUSTMENT TO THE
RICH AS HAS BEEN A POCKET-SIZE.
THE SIGNIFICANT THE WIND WOULD
BE PROBABLY MORE DETAILED
UNDER TODAY'S ENVIRONMENT.
THE WIND ENERGY GUIDELINES
WOULD HAVE RECOMMENDED TWO
YEARS OF FATALITY MONGERING BUT
THE PERMIT ISSUE REQUIRED THREE
YEARS OF HOSPITALITY MONITORING
SO THE PERMIT ACTUALLY REQUIRED
MORE RIGOR THAN THE CURRENT
WIND ENERGY GUIDELINES GIVEN
THIS SITE.
SO AFTER THE TIER 3 EVALUATION WE

THEN MOVE DOWN TO TIER 4, POST- CONSTRUCTION MONITORING AND IN THE CASE OF MOUNT STORM, WE FOCUSED ON TIER 4A AND THAT IS A FATALITY MONITORING BECAUSE THERE WERE NO SPECIES OF HABITAT FRAGMENTATION CONCERNS IDENTIFIED.
AS I SAID, THE REPORT FOR THE PERMIT REQUIRED THREE-YEAR MIGRATION PERIOD FATALITY MONITORING AND SO DURING THAT THREE-YEAR PERIOD THE FATALITY FOR BIRDS WERE ESTIMATED AT .35-3.9 BIRDS PER MEGAWATT PER STUDY PERIOD WHICH IS COMPARABLE TO OTHER EASTERN PROJECTS.
AND AS WITH OTHER PROJECTS, THE MAJORITY OF FATALITIES WERE PASSERINES, MIGRATING AND RESIDENT.
AND THE PASSERINES FATALITY RATE WAS SLIGHTLY HIGHER THEN PREDICTED BUT NOT BY VERY MUCH.
THE BAT FATALITIES WERE ESTIMATED TO BE 2.88-12.11 THAT'S PER MEGAWATT PER STUDY PERIOD.
THAT IS IN THE TOP QUARTILE OF THE EASTERN SITES BUT LOWER THAN THE TOP 10 PERCENT.
AND AS WITH OTHER STUDIES, THE PRIMARY SPECIES WERE MIGRATORY TREE BATS AND THE RATES WERE SLIGHTLY LOWER THEN WHAT HAD BEEN PREDICTED FOR THE SITE BASED ON THE NEARBY MOUNTAINEER SITES.
SO IN ADDITION TO OR MAKING ESTIMATES FOR BAT FATALITIES FACILITY WIDE, THE DATA ALSO INCLUDED A VERY DETAILED ANALYSIS OF BATS FOUND THROUGH DAILY SEARCHES AND AS YOU CAN SEE FROM THIS BOX AND THE

WHISKER PLOT, THE FATALITIES
WERE CONCENTRATED BETWEEN
SLIGHTLY OVER ZERO AND 15
CARCASSES PER TURBINE.
YOU WILL NOTICE THERE IS AN
ASTERISK IN THE FIRST THREE
SEASONS OF STUDY, 2008 IN SPRING
AND FALL 2009.
TURBINE 81 WAS AN OUTLIER AND AS
INDICATED BY THE ASTERISK.
AND THEN AFTER 2009, 2010, SPRING
AND FALL, THE TURBINE 81 FATALITY
RATE WAS MUCH MORE IT NEAR THE
MEDIAN.
AND WE BELIEVE THAT WAS
PROBABLY RELATED TO THE
PRESENCE OF A POND THAT WAS
ULTIMATELY RECLAIMED BECAUSE
ONCE THE POND WAS RECLAIMED,
ADJACENT TO TURBINE 81 THEN THE
FATALITY RATE WENT DOWN.
SO THE TIER 4 DECISION PROCESS
FOLLOWED.
FIRST OF ALL, THE BIRD FATALITIES
WERE CLOSE TO THE PREDICTED
VALUES, SLIGHTLY HIGHER BUT VERY
CLOSE.
MOST OF THE SPECIES OF CONCERN
THAT HAD BEEN IDENTIFIED
PRECONSTRUCTION WERE NOT
PRESENT IN THE FATALITY SAMPLE.
THE FATALITY SAMPLE WAS
PRIMARILY PASSERINES, SOME
MIGRATORY AND SOME PRESIDENT.
THE BAD THE TALLIES WERE CLOSE
TO PREDICTED VALUES.
THE TURBINE OUTLIER WAS
PROBABLY AS A RESULT OF A
HABITAT CONDITION.
THE PRIMARY BAT SPECIES KILLED
WERE TREE BATS, HOARY BATS BATS,
AND THERE WERE NO THREATENED
AND ENDANGERED FATALITIES
DOCUMENTED.
THE FATALITY RATE WAS VERY

SIMILAR TO NEARBY FACILITIES,
PERHAPS SLIGHTLY LOWER.
AND THERE WAS NO SPECIES OF
HABITAT FRAGMENTATION CONCERNS
PRESENT.
SO THE NEXT STEP IN THE WIND
ENERGY GUIDELINES IS A TIER FIVE,
IF NECESSARY, TIER FIVE STUDIES
ARE SPECIALIZED STUDIES THAT
TYPICALLY RELATE TO MITIGATION
MEASURES OR OTHER STUDIES THAT
REQUIRE A GREAT DEAL OF MORE
DATED THAN A TYPICAL
POST- CONSTRUCTION STUDY.
AND IN THIS CASE, THE PROJECT
SYNTHESIZED INFORMATION FROM
TEN OPERATIONAL MITIGATION
STUDIES IN NORTH AMERICA.
THE CONCLUSION WAS THAT IF THE
SITE MANAGED THE OPERATIONS OF
THE TURBINE BY INCREASING THE
CUT IN SPEED OR FEATHERING THE
BLADES, THAT IS TURNING THE
BLADES PARALLEL TO THE DIRECTION
OF THE WIND SO THAT THEY BARELY
ROTATED OR ROTATED MUCH
SLOWER THAN THE NORMAL CUT IN
SPEED, THESE STUDIES INDICATED
THAT BY DOING SO YOU COULD
REDUCE FATALITIES, BAT FATALITIES.
SO THIS METHOD OF BLADE
FEATHERING WAS IMPLEMENTED FOR
TWO YEARS IN CONJUNCTION WITH
THE TIER 4A AND FEATHERING IS
CURRENTLY OPERATIONAL AND
AUTOMATED THAT ALL TURBINES.
SO IN CONCLUSION, WE BELIEVE THAT
THIS CASE STUDY IS SOMEWHAT
REPRESENTATIVE OF PROJECTS IN
THE NORTHEAST, PARTICULARLY IN
MOUNTAIN AREAS.
THE PROJECT LACKED SPECIES OF
HABITAT FRAGMENTATION
CONCERNS.
SO IT DOES NOT REPRESENTATIVE A

PROJECT WHERE YOU WOULD HAVE
THAT ISSUE TO EVALUATE.
THE TIERED STRUCTURE REALLY DID
NOT CHANGE ANY OF THE
CONCLUSIONS THAT WERE DRAWN
BASED ON THE ORIGINAL STUDIES.
THERE WERE SOME TIER 3 STUDIES
THAT WERE CONDUCTED THAT
PROBABLY WERE NOT NECESSARY AS
A RESULT OF OUR ANALYSIS.
PERHAPS THE BEST EXAMPLE IS THE
WARBLER STUDY.
THERE IS MORE RISK TO BATS THEN
IDENTIFIED ORIGINALLY AND UNDER
TODAY'S ENVIRONMENT AND
CONCERN OF THE INDIANA BATS IN
PARTICULAR, THERE WOULD
PROBABLY HAVE BEEN A MORE
RIGOROUS EVALUATION OF THE
POTENTIAL OCCURRENCE OF INDIANA
BATS AT THE SITE.
AND I THINK OUR USE OF THIS CASE
STUDY ILLUSTRATES HOW THE
TIERED APPROACH CAN BE UTILIZED
AND DONE IN EVALUATING A SITE AND
ILLUSTRATE SOME OF THE
ADVANTAGES OF THE TIERED
APPROACH.
THANK YOU.
OKAY.
>>CHRISTY JOHNSON-HUGHES:
THANK YOU SO MUCH DALE.
THAT IS AN EXCELLENT EXAMPLE OF
HOW THE TIERED APPROACH WAS
APPLIED TO A PROJECT AND BEFORE
THAT WAS APPLIED AND THAT IS SO
INTERESTING THAT THERE ARE SOME
COMMONALITY IS WITH BEFORE AND
AFTER THE TIERED APPROACH BUT
ONE THING THAT REALLY STRIKES ME
IS THE NEED TO COMMUNICATE.
SO WHAT ARE YOUR THOUGHTS ON
COMMUNICATION DURING THE TIERED
APPROACH?
>>DALE STRICKLAND: I THINK

COMMUNICATION IS KEY TO DOING A GOOD JOB BOTH FROM A SCIENCE POINT OF VIEW AND A POLICY POINT OF VIEW.
FROM A SCIENCE POINT OF VIEW IT'S ALWAYS GOOD TO HAVE OTHER BIOLOGISTS MAKING SUGGESTIONS ON HOW STUDIES SHOULD BE CONDUCTED.
BUT FROM A POLICY POINT OF VIEW, IT HELPS PEOPLE ACTUALLY CONDUCTING STUDIES PRIORITIZE THEIR INTERESTS.
>>CHRISTY JOHNSON-HUGHES: ALSO CONSISTENCY.
YOU MENTIONED ABOUT THE BAT ASSESSMENTS AND HOW THEY MIGHT BE DONE DIFFERENTLY TODAY BECAUSE OF THE CONCERNS ABOUT INDIANA BATS.
AND I THINK THAT IS ALSO ONE OF THESE DRINKS OF THE TIERED APPROACH IS WHEN WE ARE WORKING IN SIMILAR HABITATS WITH SIMILAR SPECIES ISSUES, THAT WE CAN MORE CONSISTENTLY APPLY OUR ASSESSMENTS.
>>DALE STRICKLAND: RIGHT.
I DON'T THINK THAT THE CONCLUSIONS WOULD HAVE CHANGED IN THIS CASE, BUT I THINK GIVEN THE ADDED CONCERN ABOUT THE INDIANA BATS, THERE WOULD HAVE BEEN MORE EFFORT PUT INTO ACTUALLY DETERMINING WHETHER INDIANA BATS OCCURRED THERE OR NOT.
THAT IS SOMETHING IN TODAY'S ENVIRONMENT WOULD CERTAINLY HAVE OCCURRED.
>>CHRISTY JOHNSON-HUGHES: THANK YOU SO MUCH DALE.
WE WILL JOIN DALE AGAIN WHEN WE GO THROUGH OUR ROUND TABLE.
SO THANK YOU AND WE WILL MOVE

ON TO OUR NEXT GUEST.
AND HERE WE ARE WITH OUR NEXT GUEST DR. CRIS HEIN FROM BAT CONSERVATION INTERNATIONAL.
WELCOME TO THE WIND ENERGY BROADCAST.
>>CRIS HEIN: THANK YOU.
>>CHRISTY JOHNSON-HUGHES: HE IS THE COORDINATOR FOR THE COOPERATIVE.
HE RECEIVED HIS PH.D IN FORESTRY NATURAL RESOURCES FROM THE UNIVERSITY OF GEORGIA.
HE HAS BEEN STUDYING THAT BEHAVIOR AND ECOLOGY FOR 14 YEARS AND WIND ENERGY ISSUES FOR SEVEN YEARS SO HE'S FAMILIAR WITH THIS ISSUE.
HE WILL TALK TO US A BIT ABOUT PRECONSTRUCTION SURVEYS FOCUSED ON BATS.
WE'VE HAD A LOT OF QUESTIONS ABOUT BATS, ACOUSTIC STUDIES AND ISSUES SURROUNDING BATS AND WIND ENERGY SO WE ASKED CRIS TO TALK TO US A LITTLE BIT MORE ABOUT THOSE PRECONSTRUCTION STUDIES.
>>CRIS HEIN: THANK YOU, CHRISTIE.
THANK YOU FOR THE INVITATION I'M HAPPY TO BE HERE TODAY TO TALK ABOUT THAT AND WIND ENERGY ISSUES.
I WANTED TO PROVIDE A OVERVIEW OF PRECONSTRUCTION STUDIES FOR BATS.
THE PURPOSE OF TIER 3 STUDIES IS IT PROVIDES THE FIRST OPPORTUNITY TO CONDUCT QUANTITATIVE AND SCIENTIFICALLY RIGOROUS STUDIES.
FOR BATS WE GET A SENSE OF ACTIVITY PATTERNS AND IDEALLY A SENSE OF POTENTIAL RISK OF A PROPOSED FACILITY.
ACOUSTIC SURVEYS ARE A

PRACTICAL METHOD FOR MONITORING BATS AT WIND ENERGY FACILITIES.
TYPICALLY THEY ARE ASSOCIATE WITH LOWER-COST, THEY ARE LESS INVASIVE.
YOU ARE NOT HANDLING OR HARMING THE BATS AND CAN BE CONDUCTED OVER A LONG PERIOD OF TIME.
YOU CAN SET THESE DETECTORS UP FOR MONTHS AT A TIME WITH MINIMAL MAINTENANCE OR UPKEEP.
SOME OF THE QUESTIONS THAT CAN BE ANSWERED WITH TIER 3 STUDIES ARE ARE SPECIES OF CONCERNS PRESENT ARE LIKELY TO USE THE FACILITY, WHAT IS THE DISTRIBUTION OR RELATIVE ACTIVITY AND BEHAVIOR OF SPECIES OF CONCERN, IS THERE POTENTIAL FOR SIGNIFICANT ADVERSE IMPACTS FOR THE SPECIES, AND IF SO HOW TO MINIMIZE OR MITIGATE THESE IMPACTS.
STUDY METHODS SHOULD BE CONSISTENT ACROSS STUDIES AND THIS ALLOWS FOR COMPARABILITY AMONG FACILITIES.
HOWEVER, WE MUST RECOGNIZE THAT YOUR STUDY DESIGN WILL VARY FROM SITE TO SITE BASED ON EQUIPMENT, PLACEMENT OF DETECTORS AND HOW MANY DETECTORS YOU MIGHT HAVE ON YOUR PROJECT.
MULTIPLE TOOLS MAY BE REQUIRED DEPENDING ON YOUR OBJECTIVE.
SOME OF THESE CAN COMPLEMENT ACOUSTIC STUDIES SUCH AS MIST-NETTING, RADAR, ROOST EXIT COUNTS AND RADIO TELEMETRY.
THE DURATION AND INTENSITY OF THE STUDY REQUIRED IS NECESSARY TO ACCURATELY CHARACTERIZE THE PRESENCE OR ACTIVITY PATTERNS

OF BATS OVER YOUR GIVEN PERIOD OF TIME.
AND IT IS NECESSARY IN ORDER TO ESTABLISH TRENDS OR ENTER ANNUAL VARIATIONS TO RECORD ACTIVITY OVER MULTIPLE YEARS.
IT WOULD TAKE A COMPLETELY SEPARATE PRESENTATION TO GO INTO DETAIL ON THE NUMBER OF DETECTORS AND COMPANIES THAT SELL THESE DEVICES.
BUT I CAN GO THROUGH RELATIVELY QUICKLY SOME CONSIDERATIONS YOU MIGHT HAVE WITH PICKING OUT YOUR EQUIPMENT.
MOST IMPORTANTLY ARE THE OBJECTIVES OF YOUR STUDY.
ANSWERING SPECIFIC QUESTIONS MAY REQUIRE ONE DETECTOR TYPE OVER ANOTHER.
COST, BUDGET CONSTRAINTS MAY INFLUENCE WHICH DETECTORS YOU BUY.
YOUR EXPERTISE IF YOU ARE FAMILIAR WITH ONE TYPE OF DETECTOR OVER ANOTHER CAN BE A FACTOR.
DATA STORAGE MIGHT BE AN ISSUE.
IF YOU'RE ABLE TO GO OUT AND EXCHANGE COMPACT FLASH CARDS ON A REGULAR BASIS, IT MAY NOT BE AN ISSUE.
BUT IF YOU ARE -- IF THE SITES ARE REMOTE AND THEY ARE OUT THERE FOR A MONTH OR TWO MONTHS AT A TIME, DATA STORAGE MIGHT BE AN ISSUE FOR YOU AS WELL AS POWER REQUIREMENTS.
YOU MIGHT BE ABLE TO CHANGE BATTERIES OUT REGULARLY OR YOU MAY NEED A SOLAR PANEL IN ORDER TO POWER THE EQUIPMENT OVER LONG PERIOD OF TIME.
WEATHERPROOFING IS ALSO IMPORTANT WHEN SETTING UP YOUR

STUDY.
SOME MICROPHONES ARE ALREADY WEATHERPROOF, OTHERS NEED SOME SORT OF PROTECTION FOR PRECIPITATION.
THE BAT HAT WITH REFLECTOR PLATE IS USED AS WELL AS THE CURVED PVC PIPE.
AS WITH YOUR HARDWARE, THE DIFFERENT TYPES OF SOFTWARE USED FOR ANALYSIS CAN VARY DEPENDING ON ANOTHER OF FACTORS.
THE TYPE OF DETECTOR, YOUR OBJECTIVES, COST AND EXPERTISE.
AND THEIR DIFFERENT WAYS YOU CAN GO ABOUT ANALYZING THESE DATA.
QUALITATIVELY YOU CAN TAKE UNKNOWN BAT CALLS AND VISUALLY COMPARE THEM TO KNOWN CALLS FROM A CALL LIBRARY THAT YOU HAVE COLLECTED OR QUANTITATIVELY USING AUTOMATED PROGRAMS THAT WILL IDENTIFY YOUR BAT PATHS FOR YOU.
ONE OF THE MOST COMMON QUESTIONS PEOPLE MIGHT ASK IS HOW MANY DETECTORS DO INDEED ON MY SITE.
THE ANSWER TO THAT IS THAT VARIES ON A NUMBER OF ISSUES.
BUT HABITAT IS A BAKE FACTOR IN HOW MANY DETECTORS YOU MIGHT HAVE.
IF YOU HAVE A RELATIVELY UNIFORM LANDSCAPE SUCH AS THE GRASSLAND, THEN YOU MIGHT NOT NEED AS MANY DETECTORS AS THEY A LANDSCAPE THAT HAD A FOREST, GRASSLANDS AND A BUNCH OF DIFFERENT TYPES OF HABITATS.
IT IS IMPORTANT TO PLACE DETECTORS HAVE MULTIPLE HEIGHTS.

WE HAVE ENOUGH DATA THAT SHOWS THE DIFFERENT BATS FLY DIFFERENT ALTITUDES AND OFTEN WE USE METER ROGER GO POWERS TO PLACE DETECTORS AND 45 OR 50 OR EVEN HIGHER IN ORDER TO RECORD THE SPECIES.
CONDUCTING SURVEYS WHEN BATS ARE ACTIVE IS IMPORTANT.
OFTEN THESE STUDIES ARE DONE SPRING THROUGH FALL IN MORE NORTHERLY LATITUDES BUT AS YOU GET INTO WARMER CLIMATES IN THE SOUTHERN PART OF THE U.S., YOUR SURVEYS MAY NEED TO BE CONDUCTED YEAR-ROUND.
AS I MENTIONED EARLIER, THERE ARE OTHER TECHNIQUES AND METHODS THAT CAN BE USED TO COMPLEMENT YOUR ACOUSTIC SURVEYS.
MIST-NETTING ALLOWS YOU TO GET DEMOGRAPHIC DATA, SPECIES ID, DNA TISSUE SAMPLES OR HAIR SAMPLES AND RADIO TELEMETRY CAN BE USED TO FIND ROOST LOCATIONS IF THAT IS IMPORTANT OR HOME RANGES OF THESE BATS.
IT'S IMPORTANT TO NOTE THE LIMITATIONS OF ACOUSTIC SURVEYS.
ACOUSTIC DATA CAN BE USED TO DETERMINE RELATIVE ABUNDANCE, BUT NOT INDIVIDUAL OR I SHOULD SAY RELATIVE ACTIVITY, BUT NOT ABUNDANCE OR INDIVIDUAL SPECIES.
INDIVIDUALS OF A GIVEN SPECIES.
DETECTABILITY IT'S IMPORTANT TO KNOW THAT THESE DETECTORS HAVE A RELATIVELY SMALL CONE OF PERCEPTION IN RELATION TO YOUR LANDSCAPE.
AND THAT FACTORS ASSOCIATED WITH DIFFERENT SPECIES SUCH AS THEIR CALL RATE, THEIR FREQUENCY, THE INTENSITY OF CALLS, CAN AFFECT THEIR DETECTABILITY AS

WELL IS HOW THEY ARE ORIENTED WITH RESPECT TO THE MICROPHONE.
IF THE BAT IS FLYING TOWARD A MICROPHONE YOU WOULD HAVE A BETTER CHANCE OF PICKING UP AT BAT AS OPPOSED TO IF IT'S FLYING ACROSS THE MICROPHONE.
AND YOUR WEATHERPROOFING EQUIPMENT WILL ALSO AFFECT YOUR DETECTABILITY.
SAMPLING INTENSITY.
IT'S IMPORTANT TO CAPTURE THE TEMPORAL AND SPATIAL VARIABILITY THROW YOUR STUDY.
YOU WOULD NOT WANT TO ONLY SAMPLE FOR A SHORT PERIOD OF TIME OVER THE SUMMER FOR A WEEK OR TWO, THAT WOULD NOT CAPTURE THE TEMPORAL VARIATION FOR THAT SEASON.
YOU WANT TO PLACE YOUR DETECTORS ACROSS THE LANDSCAPE SO THEY CAN ACCOUNT FOR THE DIFFERENT HABITAT CONDITIONS.
AND AT PRESENT THERE IS NO CONSENSUS ON WHAT CONSTITUTES RISK FOR BATS.
WHAT LEVEL OF ACTIVITY INDICATES THAT A SITE MIGHT BE OF HIGH OR LOW RISK.
FOR A NUMBER OF YEARS WE HAVE BEEN STUDYING BATS USING ACOUSTIC DETECTORS AT WIND ENERGY FACILITIES, AND A CONSISTENT PATTERN IS THERE IS A LOT OF VARIATION IN ACOUSTIC DATA.
HOWEVER,, WE DO SEE TRENDS IN ACTIVITY WITH MOST OF THE ACTIVITY OCCURRING IN LATE SUMMER OR ALL AND THIS COINCIDES WITH THE BATS OF MIGRATION FROM NORTH TO SOUTH AND WITH THEIR MATING PERIOD.

ACTIVITY ALSO IS NEGATIVELY
RELATED TO WIND SPEED.
SO AS WIND SPEED INCREASED THAT
ACTIVITY TENDS TO DECREASE.
THERE IS A POSITIVE RELATIONSHIP
WITH ACTIVITY AND TEMPERATURE
SUCH THAT WITH INCREASING
TEMPERATURES, WE HAVE
INCREASING BAT ACTIVITY.
THIS MAY RELATE TO WHEN INSECTS
ARE MOST ACTIVE OR WHEN THE
BATS HAVE MORE REGULATORY
NEEDS.
THE NEXT SLIDE SHOWS FIGURES
RELATED TO SPATIAL AND TEMPORAL
VARIATIONS.
THIS SLIDE HAS TWO YEARS OF DATA
BOTH 2009 AND 2010 AND WE
SEPARATED OUT THE ECHOLOCATION
CALLS INTO THREE PHONIC GROUPS
ARE FREQUENCY GROUPS
HIGH-FREQUENCY BATS, THOSE THAT
CALL AT THE ABOVE DIRTY
5 KILOHERTZ, LOW-FREQUENCY BATS
AND HOARY BATS THAT'S WHICH ARE
A SUBSET OF THE LOW-FREQUENCY
GROUP YOU'RE EACH BAR
REPRESENTS A MET TOWER WHERE
DATA WAS RECORDED AND THE
DARKER GRAY TOWER IS ACTIVITY
RECORDED AT THE DETECTOR
1.5 METERS ABOVE THE GROUND AND
THE LIGHTER GRAY IS ACTIVITY
RECORDED 44 METERS ABOVE THE
GROUND.
YOU CAN SEE AT A GIVEN PROPOSED
SITE THERE'S A LOT OF VARIABILITY
AMONG THE DIFFERENT MET
TOWERS.
YOU CAN ALSO SEE FOR
SERPENT -- CERTAIN FREQUENCY
GROUPS ACTIVITY IS HIGH OR LOWER
AT EACH OF THESE DIFFERENT
HEIGHT.
FOR THE HIGH-FREQUENCY GROUPS

THEY ARE MORE ACTIVE AT THE LOWER DETECTOR WHERE AS LOW-FREQUENCY BATS AND HOARY BATS BATS ARE MORE ACTIVE AT HIGHER ELSE TO.
WHEN WE LOOK AT TEMPORAL VARIATION BOTH WITHIN AND BETWEEN YEARS, THIS FIGURE IS SET UP SIMILAR TO THE PREVIOUS ONE WHERE WE HAVE TWO YEARS OF DATA MP3 FREQUENCY GROUPS.
WE CAN SEE THAT FOR ANY GIVEN FREQUENCY GROUP, ACTIVITY VARIES BY NIGHT, WITHIN A SEASON.
YOU MIGHT HAVE NIGHTS WHERE YOU HAVE A LOT OF ACTIVITY FOLLOWED BY PERIODS OF LOW ACTIVITY.
AND THAT IS A DIFFERENT FREQUENCY GROUP HAVE DIFFERENT PEAKS IN ACTIVITY WITHIN A YEAR AND THIS CHANGES BETWEEN AND AMONG EARS.
THAT'S WHY IT'S IMPORTANT TO GET A SENSE OF THIS INTER- ANNUAL VARIATION.
ACTIVITY ALSO VARIES WITH IN A NIGHT.
AND WE CAN SEE CHANGES IN THIS WITHIN THAT VARIATION ACROSS THE YEAR.
SO ON THE X. AXIS WE HAVE THE DIFFERENT MONTHS OF THE STUDY PERIOD AND WITHIN EACH MONTH ARE THE HOURS OF ACTIVITY.
AND THERE IS A BIG CHANGE IN THIS ACROSS THE SEASON.
TYPICALLY WE SEE A BIMODAL ACTIVITY FOR BATS WHERE THEY ARE MOST ACTIVE AS THE SUNSETS.
THERE IS A LULL DURING THE MIDDLE OF THE NIGHT AND THEN A SECOND PEAK IN ACTIVITY JUST BEFORE DAWN.
AND YOU SEE THAT DURING A COUPLE OF MONTHS BUT THERE ARE

OTHER MONTHS WHERE THIS PATTERN IS QUITE DIFFERENT WHERE YOU WILL HAVE MULTIPLE PEAKS OR MAYBE ONLY ONE PEAK IN ACTIVITY.
AND FINALLY WE CAN LOOK AT ACTIVITY IN RELATION TO WEATHER CONDITIONS.
AS I MENTIONED EARLIER THERE'S A NEGATIVE RELATIONSHIP BETWEEN THE WIND SPEED AND BAT ACTIVITY AND A POSITIVE RELATIONSHIP BETWEEN THAT ACTIVITY AND TEMPERATURE.
THIS IS A GRAPHICAL REPRESENTATION OF THAT.
ONE OF THE MORE IMPORTANT QUESTIONS THAT WE HAVE BEEN INTERESTED FOR QUITE A WHILE IS CAN WE USE ACTIVITY TO GET THE RISK OF A SITE.
AND IF WE CAN, THEN WE MIGHT BE ABLE TO SITE FACILITIES IN LOW RISK AREAS OR EVEN MICRO- SITE CERTAIN TURBINES WERE BAT ACTIVITY IS LOW.
THIS WOULD GIVE US ANOTHER TOOL IN OUR TOOLBOX IN LIMITING OR REDUCING BAT FATALITIES.
THE IDEA HERE IS THAT HIGH ACTIVITY WOULD EQUAL HIGH FATALITY.
THE PROBLEM IS WE ARE NOT SURE IT'S LOW ACTIVITY EQUALS LOW FATALITY PARTICULARLY IF BATS ARE ATTRACTED TO TURBINES.
THERE MAY BE FEWER BATS FLYING AROUND THE LANDSCAPE, BUT THOSE BATS, IF THEY ARE ATTRACTED WOULD COME INTO CONTACT WITH THESE TURBINES AT A HIGHER FREQUENCY.
THERE ARE ALSO NUMBER OF PROBLEMS IN TRYING TO DEVELOP THIS RELATIONSHIP.
WE HAVE LIMITED DATA TO WORK

WITH.
YOU RECORD PRECONSTRUCTION DATA IN A DIFFERENT HERE THAN YOU DO POST CONSTRUCTION DATA SO THEIR ANNUAL VARIATIONS IN HOW BATS ARE ACTIVE.
HABITAT CONDITIONS OFTEN CHANGE BETWEEN THE TWO TYPES OF STUDIES.
IF YOU ARE IN A FORESTED ENVIRONMENT YOU CLEARED TREES AND ALL FACILITIES WERE WE ARE CONSTRUCTING THESE LARGE WIND TURBINES WHICH ARE NEW TO THE LANDSCAPE, WHERE WE RECORD ACTIVITY, WHAT HEIGHT, WHAT METRICS WE USE IN ALL CONFOUND THIS RELATIONSHIPS.
WHAT WE HAVE BEEN ABLE TO DO SO FAR IS WORKING WITH THE NATIONAL RENEWABLE ENERGY LABORATORY AND WITH WEST, IS COMPILED DATA AVAILABLE DATA, ON BOTH PRECONSTRUCTION AND POST CONSTRUCTION STUDIES AND WE ARE OBTAINED SITES, 12 SITES THAT HAD BOTH SETS OF DATA.
AND FROM THIS, WE RAN A REGRESSION LINE THROUGH THESE DIFFERENT POINTS AND WE SEPARATED THEM UP BY REGION AND WHAT WE SEE IS A POSITIVE TREND SUGGESTING THAT HIGHER ACTIVITY EQUALS HIGHER FATALITY BUT THE REGRESSION WAS NOT SIGNIFICANT AND HAS A RELATIVELY LOW R. SQUARED VALUE.
THE PREDICTION INTERVALS WHICH ARE REPRESENTED BY THE DASHED LINES ARE RELATIVELY LARGE AND FALL BELOW ZERO.
SO BASED ON THIS LIMITED DATA SET, IT IS REALLY HARD TO MAKE ANY SORT OF ASSESSMENT OF WHETHER BAT ACTIVITY CAN BE USED TO

PREDICT RISK BUT I'M NOT WILLING
TO GIVE UP ON THIS.
I THINK WE CAN FIND WAYS TO
IMPROVE THIS TYPES OF SYNTHESIS
BY LOOKING AT SPECIFIC REGIONS.
IF WE CAN IDENTIFY SPECIES THAT
WILL BE HELPFUL AS WELL AS
DIVIDING THE ACTIVITIES BY
DIFFERENT HEIGHTS FOR THE
DIFFERENT SPECIES.
SO PRECONSTRUCTION STUDIES
HAVE VALUE.
THEY GIVE US AN IDEA OF BAT
ACTIVITY PATTERNS AND THEY ARE
ESPECIALLY IMPORTANT IN NEW
AREAS WHERE WE DON'T HAVE A LOT
OF DATA SUCH AS THE
SOUTHWESTERN PART OF THE U.S.
AND THE SOUTHEASTERN PART OF
THE U.S.
WE CAN IMPROVE ON THESE
SYNTHESES REPORTS BY
INCORPORATING HEIGHT, REGION,
SPECIES OR PHONIC GROUP.
SOME OF THE SOFTWARE THAT IS
AVAILABLE NOW AS I MENTIONED
EARLIER, LOOKS AT TRYING TO
AUTOMATICALLY IDENTIFY SPECIES
AND IMPROVEMENTS NEED TO BE
MADE IN THE SOFTWARE WHICH WILL
HELP OUT IN MAKING THESE
COMPARISONS BETWEEN ACTIVITY
AND TOTALITY.
WE NEED TO ENHANCE OUR
TECHNOLOGY AS WE MOVE
FORWARD.
TRANSPARENCY IS VERY IMPORTANT,
MAKING THE DATA AVAILABLE FOR
THESE TYPES OF SYNTHESES AND,
OF COURSE, AS MENTIONED EARLIER,
COMMUNICATION IS IMPORTANT IN
TRYING TO RESOLVE COMPLEX
ISSUES SUCH AS THIS.
THANK YOU.
>>CHRISTY JOHNSON-HUGHES:

THANK YOU CRIS.
THAT WAS VERY HELPFUL.
I THINK A LOT OF OUR VIEWERS ARE STRUGGLING WITH HOW TO IDENTIFY BATS AND ACTIVITY LEVELS OUT THERE IN THE FIELD AND ACOUSTICS ARE DEFINITELY ONE OF THE TOOLS THAT WE HAVE BEEN USING MORE AND MORE RECENTLY.
BUT I HAVE ALSO NOTICED THAT AS YOU MENTIONED THERE ARE A LOT OF [INAUDIBLE] FOR ACOUSTIC STUDIES THAT IT SOUNDS TO ME LIKE WE ARE TALKING ABOUT COMMUNICATION WHERE ALL THE STAKEHOLDERS AGAIN GET TOGETHER, FIGURE OUT WHAT ARE THE BEST METHODS FOR TRYING TO DETERMINE WHICH BETS ARE OUT THERE AND WHAT THEY ARE DOING OUT THERE IN THE LANDSCAPE.
>>CRIS HEIN: BATS DO NOT MAKE IT EASY ON US.
THEY FLY AT NIGHT, THEY ARE CRYPTIC, THEY ARE SMALL AND THEY DON'T MAKE NOISES WE CAN HEAR.
IN ORDER TO GET THE SPECIES ID A COMBINATION OF TOOLS MIGHT BE NECESSARY.
ACOUSTICS ARE HELPFUL IN GETTING CERTAIN FREQUENCY GROUPS OR PHONIC GROUPS BUT GETTING DOWN TO THAT SPECIES ID, YOU MAY NEED MIST-NETTING OR OTHER TECHNIQUES.
>>CHRISTY JOHNSON-HUGHES: AND ALSO FOR THE ABUNDANCE OF BATS YOU MENTIONED WE REALLY CAN'T DETERMINE ABUNDANCE USING THIS METHODOLOGY.
AND WHEN WE ARE TRYING TO PREDICT TAKE OF SPECIES, IT CAN BE VERY DIFFICULT.
>>CRIS HEIN: YES, IT IS A CHALLENGE.

REALLY THE ONLY ABUNDANCE DATA WE CAN GET IS FROM HIBERNATING CAVE BATS WHERE WE CAN GO INTO LOCATION AND COUNT THE NUMBER OF BATS OR GET A SENSE OF THE NUMBER OF BATS IN ONE LOCATION.
BUT, THE BATS THAT ARE MOST OFTEN AFFECTED BY WIND ENERGY ARE FORCED BATS WHICH ROOST AND ARE DISPERSED ACROSS THE LANDSCAPE SO IT'S VERY DIFFICULT TO GET AN IDEA OF HOW MANY ARE ACTUALLY OUT THERE.
>>CHRISTY JOHNSON-HUGHES: GOOD POINT.
THANK YOU CRIS.
WE WILL BE JOINING CRIS AGAIN SHORTLY AS WE GO TO OUR ROUND TABLE.
WELCOME TO OUR ROUND TABLE AND THIS IS WHERE WE ACCEPT QUESTIONS FROM OUR AUDIENCE AND GIVE DALE AND CRIS A CHANCE TO ANSWER THEM.
AS YOU CAN SEE, THEY ARE SITTING HERE AT THE TABLE WITH ME AND WE ALREADY HAVE SOME QUESTIONS COMING IN SO THANK YOU VERY MUCH AND AGAIN JUST REMEMBER IF YOU WANT TO ASK A QUESTION TYPE IT INTO THE CHAT BOX AND CLICK ON SAY.
SO I SEE WE HAVE A QUESTION HERE FOR DALE.
HOW ARE BATS TO TELL IT A RATES CALCULATED AT MOUNT STORM?
>>DALE STRICKLAND: THE FATALITY RATES CONSIDER 4 FACTORS THE TOTAL NUMBER OF CARCASSES FOUND ON THE PLOTS THAT WERE SEARCHED DURING DAILY SEARCHES.
THE SECOND FACTOR WAS THE PROBABILITY THAT A SEARCHER WOULD ACTUALLY FIND A CARCASS AND THE THIRD FACTOR WAS THE

PROBABILITY THAT THE CARCASS WOULD BE AVAILABLE TO BE FOUND.
IN OTHER WORDS THE CARCASS REMOVAL WAS ESTIMATED AND THEN FINALLY, THE PROPORTION OF THE PLOTS THAT WAS SEARCHED AND THE PROPORTION OF BATS THAT WERE LIKELY TO BE THERE BASED ON THE DISTRIBUTION OF CARCASSES IN THE PLOT.
AND FINALLY, THE NUMBER OF CARCASSES WERE DIVIDED BY THE PROBABILITY AND THE PROBABILITY THAT THOSE CARCASSES WERE EVEN DETECTED.
SO THE RAW CARCASS NUMBERS WERE ADJUSTED.
>>CHRISTY JOHNSON-HUGHES: THANK YOU DALE.
LET'S MOVE ONTO ANOTHER QUESTION.
DOES THE METRIC BAT PER MEGAWATT STUDY PERIOD IMPLY THAT THE NUMBER SHOULD BE DOUBLE FOR AN ANNUAL MORTALITY RATE TO A STUMP FOR THE -- TO ACCOUNT FOR THIS STUDY PERIOD'S PER YEAR?
>>DALE STRICKLAND: NOT REALLY.
THIS STUDY FOCUSED ON THE MIGRATION PERIODS SO HALF THE YEAR WAS MONITORED FOR FATALITIES THAT IS SPRING AND FALL MIGRATION.
BUT BASED ON DATA FROM LOTS OF OTHER SITES WE KNOW THAT MOST OF THE FATALITIES OCCUR DURING THE FALL MIGRATION PERIODS AND THERE MIGHT BE SOME FATALITIES DURING THE SUMMER PERIOD BUT DURING THE WINTER THERE SHOULD NOT BE ANY FACILITIES -- FATALITIES BECAUSE THEY'VE MIGRATED TO THE SOUTH.
SO THIS IS A WAY TO STANDARDIZE

THE DATA SO COULD BE COMPARED TO OTHER SITES BECAUSE WE DIDN'T HAVE FULL-YEAR ESTIMATES FOR FATALITIES.
>>CHRISTY JOHNSON-HUGHES: SO EVEN DISTRIBUTION THROUGHOUT THE YEAR OF THOSE FATALITIES.
>>DALE STRICKLAND: DEFINITELY NOT AN EVEN DISTRIBUTION.
THE BATS FOUND THAT MOST FACILITIES ARE THERE DURING THE MIGRATION PERIODS.
>>CHRISTY JOHNSON-HUGHES: LET'S GO INTO ANOTHER QUESTION.
IS THERE ANY ADDITIONAL MONITORING EFFORTS SUGGESTED IN THE TIERED APPROACH.
FOR EXAMPLE, FIVE YEARS POST- CONSTRUCTION AND I THINK EITHER ONE OF OUR GUESTS CAN ANSWER THAT.
THIS IS A GENERAL TIERED APPROACH TYPE OF QUESTION AND WE DO RECOMMEND TO THE INDUSTRY, TO PROJECT PROPONENTS THAT THEY CONDUCT A MINIMUM OF TWO YEARS POST- CONSTRUCTION BUT THAT CAN BE EXTENDED DEPENDING ON WHAT IS FOUND IN THE ANALYSIS.
DALE, WHAT ARE YOUR THOUGHTS ON THAT?
>>DALE STRICKLAND: BASED ON THE GUIDELINES THERE IS REALLY NO REAL REASON TO CONDUCT ADDITIONAL STUDIES THAT THIS PARTICULAR SITE.
THE MITIGATION METHODS IMPLEMENTED UP HERE TO BE WORKING AND THE REAL UNANSWERED QUESTION AT THIS SITE WITH MOST SITES, PARTICULAR WITH REGARD TO BATS IS WHAT IS THE AFFECT OF FATALITIES THAT ARE OCCURRING ON THE BATS

POPULATION AND THAT IS NOT AN ANSWER THAT CAN BE GAINED FROM ADDITIONAL STUDIES OF THIS PARTICULAR SITE.
IT'S A MUCH BROADER STUDY.
>>CHRISTY JOHNSON-HUGHES: ALL RIGHT, THANK YOU.
I THINK CRIS WE ARE GOING TO GIVE YOU A QUESTION.
THE BAT OR COUPS -- ACOUSTICAL COURTING SOFTWARE ACCEPTABLE?
>>CRIS HEIN: ABSOLUTELY.
THERE ARE NUMBER OF DIFFERENT TYPES OUT THERE.
HISTORICALLY, AND I THINK MOST OF THE AVAILABLE STUDIES HAVE USED DETECTOR SO WE HAVE A LOT OF INFORMATION ABOUT THAT EQUIPMENT AND POST DATA ANALYSIS SOFTWARE AND THEIR OTHER SYSTEMS BEING USED MORE OFTEN AND SO I THINK ALL OF THESE ARE ACCEPTABLE FOR USE.
THERE MIGHT BE SOME DIFFICULTY IN COMPARING AMONG THE DIFFERENT ATTACKER TYPES THAT DON'T HAVE DIFFERENT CONES OF PERCEPTION AND DIFFERENT WEATHERPROOFING ASSOCIATED WITH THEM, BUT ABSOLUTELY.
>>CHRISTY JOHNSON-HUGHES: GREAT.
THANK YOU.
ALRIGHT A CUT IN SPEED OF 1.5-3.0 METERS PER SECOND IS VERY LOW COMPARED TO PUBLISHED STUDIES.
WHO WOULD LIKE TO TAKE THAT ONE?
>>CRIS HEIN: I THINK WITH THE STUDIES HAVE LOOKED AT OUR 1.5-3 METERS ABOVE NORMAL CUT IN SPEED WHICH IS TYPICALLY BETWEEN THREE AND 4 METERS PER SECOND SO THAT BUMPS IT UP ANYWHERE

BETWEEN FIVE AND 6 1/2 METERS PER SECOND IN THOSE STUDIES SO I THINK THAT'S WHAT THAT REFERS TO.
>>CHRISTY JOHNSON-HUGHES: THANK YOU.
ALL RIGHT, ANOTHER QUESTION SINCE THERE ARE SO MANY DIFFERENT TECHNOLOGIES FOR ACOUSTIC BAT MONITORING, EITHER SYSTEMS THAT ARE TECHNOLOGICALLY BETTER THAN OTHER REGARDING THE USER EXPERIENCE?
YOU TOUCHED ON THAT ALREADY CRIS.
>>CRIS HEIN: I JUST REALLY THINK IT DEPENDS ON YOUR OBJECTIVE, WHAT TYPE OF DATA YOU WANT TO GET, YOUR BUDGET AND A NUMBER OF FACTORS.
SO IT DOES VARY SITUATION BY SITUATION.
>>CHRISTY JOHNSON-HUGHES: ALL RIGHT.
DID YOU USE ACOUSTIC MONITORS AT MOUNT STORM?
IF SO HOW MANY DID YOU HAVE AND HOW LARGE WAS THE PROJECT AREA?
DALE.
>>DALE STRICKLAND: THERE WAS NO ACOUSTIC MONITORING CONDUCTED AT MOUNT STORM DURING MY PRESENTATION I POINTED OUT THERE WAS A BIOLOGICAL ASSESSMENT CONDUCTED WHICH WAS REVIEWED WITH HER AGENCIES AND BASED ON THE INFORMATION AVAILABLE AT THAT TIME, THERE WAS A DECISION MADE THAT IT WAS UNLIKELY THAT INDIANA BATS WOULD OCCUR AT THIS SITE FOR A NUMBER OF BIOLOGICAL REASONS.
THE VIRGINIA LONG YOUR BAT ITS RANGE WAS FURTHER SOUTH AND

THERE WERE TWO SPECIES OF GREATEST CONCERN WERE UNLIKELY TO BE AT THE SITE AND THERE WAS NOT THIS HEIGHTENED CONCERN OVER BATS FATALITY RATES AT WIND FACILITIES AT THAT POINT.
SO THERE WERE NO ACOUSTIC SURVEYS DONE FOR BATS.
AS I ALSO POINTED OUT I BELIEVE IT'S THE SAME PROJECT WERE BEING EVALUATED TODAY THERE WOULD BE MORE STUDY DONE TO TRY TO ESTIMATE THE ACTUAL USE OF THE SITE BY BATS.
>>CHRISTY JOHNSON-HUGHES: AS A FIELD BIOLOGIST BACK IN THE DAY WHO SPENT TIME REVIEWING THE MOUNT STORM PROJECT, ACOUSTIC MONITORS WERE STILL VERY NEW.
WE WERE STILL COMPILING OUR LIBRARY OF CALLS AND DETERMINING THE ACCURACY OF THAT METHODOLOGY SO AT THE TIME WE WERE NOT QUITE READY TO DO A ACOUSTIC MONITORING.
NOW IT'S MORE ACCEPTED.
WE HAVE A BETTER RANGE OF KNOWLEDGE.
OUR LIBRARIES ARE LARGER.
SO I THINK IT'S BECOME A MORE STANDARD PART OF OUR PRECONSTRUCTION STUDY GROUPING THEN IT WAS AT THE TIME WE WERE DOING THE MOUNT STORM PROJECT.
>>DALE STRICKLAND: I AGREE.
>>CHRISTY JOHNSON-HUGHES: ALL RIGHT,, LET'S TAKE ANOTHER QUESTION.
THEY ARE ASKING US TO ELABORATE ON HOW TO DETERMINE THE APPROPRIATE LEVEL OF EFFORT AND THIS IS FOR BAT MONITORING DETECTOR DICE ETC. FOR ACOUSTIC MONITORING.

SO, CRIS WOULD YOU LIKE TO TACKLE THAT ONE?
>>CRIS HEIN: SURE.
REGARDLESS OF THE SEASON THAT THEY ARE CHOOSING TO STUDY SAY SPRING THROUGH FALL OR YEAR ROUND, I THINK HAVING THE DETECTORS ACTIVELY MONITORING EACH NIGHT IS IMPORTANT BECAUSE OF THE VARIATION THAT OCCURS WHERE YOU HAVE DECENT ACTIVITY SOME NIGHTS AND LOW OTHER NIGHT SO I WOULD RECOMMEND THAT FOR ANY STUDY THAT IS BEING CONDUCTED.
>>CHRISTY JOHNSON-HUGHES: GREAT THANK YOU.
ALL RIGHT, SO WE HAVE A QUESTION ABOUT TURBINE 81.
WHY WASN'T TOUR BY 81 CURTAILED UNTIL THIS WAS RECLAIMED FOR STATE PROJECTS IS THIS A REQUIREMENT?
>>DALE STRICKLAND: FIRST OF ALL LET'S RECALL THIS IS RETROSPECTIVE.
SO AT THE TIME WHEN THE STUDIES WERE BEING CONDUCTED AND THE LARGER NUMBER OF BATS -- THAT FATALITIES WERE OCCURRING AT TURBINE 81, THERE WAS NOT A HUGE NUMBER OF FATALITIES IT WAS SIMPLY MORE THAN AT MOST OF THE OTHER TURBINES SO THERE WAS NO CONCERN ABOUT THE OVERALL FATALITY RATES BEING CALCULATED, BUT IT WAS NOTED IN LOOKING THROUGH THE DATA THAT TURBINE 81 WAS AN OUTLIER AND IT WAS HARD TO GIVE UP THE LEVEL OF STUDY BEING CONDUCTED AT THAT POINT IN TIME.
IT WAS HARD TO TELL FOR SURE WHAT THE CAUSE WAS, BUT WE NOTED IN THE INFORMATION WE

LOOKED AT THAT ONCE THAT POND
WAS RECLAIMED, THOSE FATALITY
RATES AND TURBINE 89 WENT DOWN
SO IT'S OUR ASSUMPTION THERE WAS
A RELATIONSHIP THERE AND THAT IS
THE FIRST PART OF THE QUESTION.
THE SECOND PART OF THE QUESTION
IS THAT YOU EXPECT TO SEE A
RANGE OF FATALITIES ACROSS THE
WIND FACILITY AND SO IT WOULD BE
VERY UNUSUAL TO SHUT DOWN OR
CURTAIL ONE SINGLE TURBINE
BECAUSE IT HAD THE HIGHEST
FATALITY RATES UNLESS THERE WAS
SOME UNUSUAL CONDITION LIKE THE
LIGHTS -- THE MERCURY VAPOR
LIGHTS THAT OCCURRED AT THE
MOUNTAINEER SITE AND PERHAPS
THIS MIGHT HAVE BEEN HIGH
ENOUGH FOR THE PEOPLE
OPERATING THE FACILITY TO MAKE
SOME CHANGE.
BUT TYPICALLY YOU ARE NOT GOING
TO MICROMANAGE THE FACILITY TO
DEAL WITH THE RANGE OF FATALITIES
DROPPED THE WINDSTORM.
>>CHRISTY JOHNSON-HUGHES: ALL
RIGHT, CRIS.
THIS ONE IS FOR YOU.
ANY EXPERIENCE WITH ASSESSING
AND MONITORING EFFECTS TO
NECTIVAROUS BATS AND NOT EVEN
GOING TO BOTHER WITH TRYING TO
PRONOUNCE THE NAMES.
>>: THEY SPECIFICALLY MENTIONED
THAT TYPE OF FAT.
SO I THINK WE HAVE VERY LIMITED
INFORMATION ON MANY OF THE
SPECIES FOUND IN THE DESERT
SOUTHWEST AND WIND ENERGY
DEVELOPMENT IS EXPANDING AND ITS
RELATIVE -- RELATIVELY NEW IN THE
REGION SO WE HAVE
PRECONSTRUCTION ACOUSTIC DATA
AS VALUABLE BECAUSE WE ARE NOT

FAMILIAR REALLY WITH THE ACTIVITY PATTERNS OF MANY OF THE SPECIES IN THE AREA.
>>CHRISTY JOHNSON-HUGHES: THANK YOU.
WHEN CALCULATING PERCENT OF DETECTING A CARCASS IS DAMAGING OF CARCASSES TAKEN INTO CONSIDERATION?
DALE.
>>DALE STRICKLAND: IT SHOULD ALWAYS BE TAKEN INTO CONSIDERATION WHEN TAKING INTO ACCOUNT THE PROBABILITY OF DETECTING THIS THERE'S TWO WAYS OF DOING THIS WITH MOUNT STORM THE INDIVIDUAL BIASES THAT IS CARCASS REMOVAL WERE ESTIMATED.
YOU CAN ALSO AVERAGE THOSE TWO, BUT WITH A PER MESSAGE -- METHOD YOU USE OR YOU WANT TO MAKE SURE THE PROBABILITY OF THE SEARCHES SEEING THE CARCASSES THERE AND THE PROBABILITY THE CARCASS REMAINS THERE AND IS VISIBLE TO THE SEARCHER, BOTH OF THOSE MUST BE CONSIDERED.
>>CHRISTY JOHNSON-HUGHES: ABSOLUTELY AND I WOULD LIKE TO MENTION WE ARE GOING TO GO INTO THIS TOPIC OF LITTLE BIT MORE IN OUR NEXT BROADCAST BECAUSE THE ACCURACY OF DETECTION OF CARCASSES IS A BIG QUESTION.
SO WE WILL SPEND MORE TIME ON THAT ON OUR NEXT BROADCAST.
ALL RIGHT, CRIS, THIS QUESTION IS DIRECTED TO YOU.
CAN YOU ELABORATE ON THE EFFECTIVENESS OF MEASURES TO REDUCE FATALITIES INCLUDING CURTAILMENT?
>>CRIS HEIN: WE DO HAVE A

COUPLE OF DIFFERENT STRATEGIES
FOR REDUCING THAT FATALITIES IN
RAISING THE CUT IN SPEEDS HAS
SHOWN TO BE REALLY EFFECTIVE IN
REDUCING THAT FATALITIES.
THERE HAVE BEEN A NUMBER OF
STUDIES ACROSS THE BOARD RACING
CUT IN SPEEDS 1.5-3 METERS PER
SECOND HAS SHOWN SIGNIFICANT
REDUCTION IN THAT FATALITIES AND
THE SYNTHESIS REPORT THAT WEST
AND AT OUR CONSERVATION
PARTNERSHIP COMPLETED OVER THE
SPRING DETAILS THE SYNTHESIS OF
CURTAILMENT STUDIES AND I DON'T
HAVE THE EXACT NUMBER OFF HAND
BUT BASICALLY LOOKING AT THE
SUITE OF FACES, YOU CAN REDUCE
THAT FATALITIES BY 50 PERCENT BY
JUST RAISING THE CUT IN SPEEDS BY
1.5-3 METERS PER SECOND.
WE ALSO HAVE VERY LIMITED
INFORMATION ON THE ECONOMIC
SIDE OF MAKING THESE
OPERATIONAL CHANGES BUT SOME
OF THE INFORMATION WE HAVE
SUGGEST THAT THERE IS VERY
MINIMAL COST ASSOCIATED WITH
MAKING THESE CHANGES AND WHAT
HELPS IS THAT WE DO HAVE AT LEAST
HERE IN THE U.S. AND CANADA A
VERY NARROW PERIOD THAT THAT
FATALITIES ARE HIGH AND THIS IS
ROUGHLY MID JULY THROUGH
SEPTEMBER.
AS OPPOSED TO YEAR-ROUND.
SO THAT I THINK REALLY MAKES A
VALUABLE STRATEGY.
JUST REAL QUICKLY, THE OTHER
STRATEGY WE HAVE THAT IS IN ITS
INFANCY IS USING ACOUSTICAL
DETERRENCE TO LIMIT BATS
INTERACTING WITH TURBINES.
THIS CAN CREATE A ZONE OF NOISE
THAT ESSENTIALLY JAMS THE BATS

RADAR AND MAKES IT
UNCOMFORTABLE FOR THEM TO FLY
IN THAT AIRSPACE.
THERE'S ONLY BEEN ONE STUDY
CONDUCTED OUT OF AN OPERATING
WIND FACILITY AND THE RESULTS
WERE A BIT CONFOUNDED BUT
SHOWED PROMISE THAT WITH
IMPROVEMENTS TO THESE DEVICES,
WE MIGHT BE ABLE TO INCREASE
THEIR SUCCESS RATE.
>>CHRISTY JOHNSON-HUGHES:
THANK YOU.
ALL RIGHT,, SO AGAIN DALE, BACK TO
TURBINE 81, WHY WAS IT ALLOWED
TO BE SITED SO CLOSE TO A POND IN
THE FIRST PLACE?
>>DALE STRICKLAND: I'M AFRAID I
FOCUSED TOO MUCH ATTENTION ON
TURBINE 81 BUT UNDERSTAND THAT
THERE WAS NO REAL KNOWLEDGE
ABOUT HOW FATALITIES WERE GOING
TO OCCUR AT ANY PARTICULAR
TURBINE THAT WAS CONSTRUCTED
AT THE SITE.
WE DRAW THE SUBJECTIVE
CONCLUSION THAT IT PROBABLY WAS
RELATED TO HABITAT AND PROBABLY
THIS POND, BUT AT THE TIME TO
PROJECT WAS CONSTRUCTED, THERE
WAS NO NOTION, I DON'T BELIEVE, AT
LEAST NOT IN THE DOCUMENTS,
THERE WAS NO NOTION THAT THAT
TURBINE WAS BEING PLACED IN A
RISKY VOCATION.
IT DOES POINT OUT THOUGH THAT IN
DOING THESE FATALITY STUDIES, YOU
CAN LEARN THINGS WHICH CAN HELP
YOU IN THE FUTURE AS YOU DESIGN
OTHER PROJECTS OR AS YOU
MANAGE A SPECIFIC PROJECT SO IT
DOES POINT OUT I THINK SOME VALUE
IN THESE POST- CONSTRUCTION
FATALITIES BUT THERE WAS NO
INTENT OR NO KNOWLEDGE OF WHAT

MIGHT HAPPEN WHEN THIS PROJECT WAS CONSTRUCTED IN THAT PARTICULAR TURBINE WAS SITED.
>>CHRISTY JOHNSON-HUGHES: WE JUST USE THE BEST AVAILABLE INFORMATION WE HAVE AT THAT TIME AND IN THIS PARTICULAR PLACE.
ALL RIGHT,, ARE THERE EFFORTS TO DEVELOP A RISK ASSESSMENT MODEL FOR BATS SIMILAR TO THAT GAMMA DISTRIBUTION MODELS FOR GOLDEN EAGLES BOX THAT'S A BIG QUESTION.
>>CRIS HEIN: I AM NOT SURE THAT THERE IS ONE BEING DEVELOPED AND I'M NOT SURE WITH THE GAMMA DISTRIBUTION MODELS SO I WOULD HAVE TO LOOK AT THAT AND SEE IF THAT IS IMPACTFUL FOR BATS.
>>DALE STRICKLAND: I KNOW A LITTLE BIT ABOUT THE EAGLE MODEL AND THERE'S REALLY NOT ENOUGH INFORMATION ON BATS.
THE REAL DILEMMA WE HAVE IS NOT KNOWING WHAT THE EXPOSURE IS AND WITHOUT MORE INFORMATION ABOUT BATS, WE WOULD NOT BE ABLE TO MODEL THAT IN THAT WAY.
THERE MAY BE OTHER WAYS TO MODEL BATS BUT NOT THAT PARTICULAR MODEL.
>>CHRISTY JOHNSON-HUGHES: THANK YOU.
HOW ABOUT ANOTHER QUESTION.
ARE THERE REGIONS IN THE COUNTRY WITH POPULATION ESTIMATE INFORMATION TO HELP BETTER UNDERSTAND WHAT FATALITY NUMBERS REALLY MEAN FOR BATS?
HOW DO WE ANALYZE THESE IMPACTS WITHOUT BETTER POPULATION DATA?
CHRISTIE WON A HANDLE HANDLE THAT ONE?

>>CRIS HEIN: SO WE DON'T HAVE POPULATION INFORMATION ON MANY BAT SPECIES.
WHAT WE DO HAVE IS CONSENSUS INFORMATION ON CAVE ROOSTING SPECIES THAT EVERY OTHER YEAR OR SO THEY WILL GO IN AND COUNT THE NUMBER OF BATS THAT ARE USING A PARTICULAR HIBERNATION SITE.
BUT -- AND THIS IS HOW WE FOUND OUT HOW MUCH IMPACT WHITE NOSE SYNDROME HAS HAD ON SOME OF THE SPECIES BUT THE BATS THAT ARE IMPACTED BY WIND ENERGY FOR THE MOST PART WE DON'T HAVE ANY INFORMATION ON THEIR POPULATION REGARDLESS OF PARTS OF THE COUNTRY.
SO GOING FORWARD, LACKING THAT INFORMATION, IT MAKES IT DIFFICULT TO FIND OUT WHAT THE POPULATION LEVEL IMPACT IS ON THESE BATS OR WHAT THE IMPACT IS ON SOME OF THESE REDUCTION MEASURES THAT WE'VE TALKED ABOUT.
WE KNOW THAT WE MIGHT BE ABLE TO REDUCE THAT FATALITIES BY 50 PERCENT BUT IS THAT ENOUGH OR ARE WE JUST DELAYING SOMETHING FARTHER DOWN THE ROAD?
SO IT IS DIFFICULT TO ASSESS THE LEVEL OF IMPACT OR THE LEVEL OF REDUCTION WITHOUT THE POPULATION INFORMATION.
>>CHRISTY JOHNSON-HUGHES: ALL RIGHT.
ALL RIGHT, SO CAN WE CONFIRM THAT AS PART OF THEIR EXPERIMENTS, THE TURBINE BLADES WERE ACTUALLY FEATHERED?
>>DALE STRICKLAND: FIRST OF ALL, AGAIN THIS IS A RETROSPECTIVE STUDY LOOKING AT THE INFORMATION SO THE FEATHERING

OF THE BLADE HAD NOTHING TO DO WITH OUR STUDY, BUT IT IS MY UNDERSTANDING, AND I HAVE HAD QUITE A BIT OF UNDERSTANDING ABOUT THIS PARTICULAR PROJECT THAT THERE WAS AN EXPERIMENT TO DETERMINE IF FEATHERING OF THE BLADES WOULD HAVE A BENEFICIAL EFFECT, THAT IS REDUCE FATALITIES WITH BATS, AND THAT WAS DONE IN CONJUNCTION WITH TIER 4A FATALITY MONITORING.
AS A RESULT OF THOSE STUDIES, THE PROJECT, THE COMPANIES THAT ARE MANAGING THIS PROJECT, HAVE IMPLEMENTED THE FEATHERING FOR THE FACILITIES.
SO IT'S PART OF THE OPERATION OF THE FACILITY NOW.
>>CHRISTY JOHNSON-HUGHES: ALL RIGHT.
HOW DOES RISK ASSESSMENT DICTATE BUDGET NEEDS?
IT SEEMS THAT AN INADEQUATE BUDGET LEADS TO AN INADEQUATE ASSESSMENT.
WHO WOULD LIKE TO TAKE THAT QUESTION?
>>DALE STRICKLAND: I WILL START.
YOU KNOW, BUDGETS ARE ALWAYS IMPORTANT AND BUDGET REQUIRE YOU TO PRIORITIZE WHAT YOU DO AND TO MAKE SOME ASSESSMENT OF WHAT RISKS PROBABLY EXIST.
SO THE TIERED APPROACH IS DESIGNED TO HELP REDUCE COSTS OR ANOTHER WAY OF SAYING THAT IS THE TIERED APPROACH IS DESIGNED TO SPREAD WHAT BUDGETS YOU HAVE OVER THE RISK ASSESSMENT PROCESS BY ALLOWING YOU TO ELIMINATE SPECIES OF CONCERN AS YOU DETERMINED THAT THE RISK FOR THOSE SPECIES IS LOW ENOUGH THAT THEY ARE NO LONGER A

SPECIES OF CONCERN.
SO BUDGETS ARE WHAT THEY ARE.
AND FROM THE STANDPOINT OF A FIELD BIOLOGIST, A SCIENTIST, THEY ARE NEVER ENOUGH BECAUSE YOU CAN NOW WE SPEND MORE MONEY ON RESEARCH.
SO GIVEN THAT BUDGETS ARE WHAT THEY ARE, THIS TIERED APPROACH SHOULD HELP FOCUS ATTENTION AND FOCUS MONEY ON THOSE PROBLEMS THAT ARE VENTURE PROBLEMS RATHER THAN SPENDING THE MONEY ON A SUITE OF STUDIES SOME OF WHICH MAY NOT BE NECESSARY.
>>CHRISTY JOHNSON-HUGHES: I THINK YOUR RESPONSE DEAL IS VERY SIMILAR TO WHAT WE HEARD FROM THE PANELISTS IN THE FIRST BROADCAST.
WHERE THEY WERE MEMBERS OF THE INDUSTRY AND HAVE INTIMATE KNOWLEDGE OF THE PROJECT AND ESSENTIALLY THEY WERE SAYING THE SAME SORT OF THING IS THAT USING THE TIERED APPROACH, THEY CAN FOCUS ON THOSE STUDIES THAT ARE TRULY NEEDED AND MAKE THE MOST USE OF THE MONEY THEY DO HAVE ON HAND.
ALL RIGHT, SO HOW ABOUT ANOTHER QUESTION?
HAS THERE BEEN ANY RESEARCH IN TWO WIND ENERGY COMPATIBLE BIRD DETERRENTS.
DALE, DO YOU HAVE ANY IDEAS ABOUT THAT?
>>DALE STRICKLAND: THERE IS CURRENTLY RESEARCH BEING CONDUCTED LOOKING AT BIRD DETERRENTS.
THERE HAS BEEN SOME LIMITED RESEARCH IN THE PAST LOOKING AT BIRD FLIGHT CONVERTERS.
THERE WAS A STUDY DONE IN

WYOMING LOOK AT THE EFFECTS OF PAINTING TURBINES WITH GELCOAT AND THEORETICALLY THE TURBINES AND THE BLADES IN THE COLUMNS WERE MORE VISIBLE TO BIRDS AND LESS RISKY.
THAT STUDY INDICATED THERE WAS NO DIFFERENCE BETWEEN STANDARD WHITE PAINT AND THE GELCOAT.
SO THERE'VE BEEN A FEW THINGS OF DEBT OVER THE YEARS.
THERE CURRENTLY IS QUITE A BIT OF RESEARCH UNDER WAY OF LOOKING AT DIFFERENT METHODS FOR DETERRING BIRDS.
I WOULD SAY BASED ON WHAT I KNOW RIGHT NOW NOTHING HAS PROVEN REALLY EFFECTIVE BUT THERE ARE A NUMBER OF PROMISING TECHNOLOGIES THAT ARE CURRENTLY BEING EVALUATED AND WE CAN HOPE THEY ARE SUCCESSFUL AND THERE'S A LOT OF ATTENTION BEING PLACED, FOR EXAMPLE, ON EAGLES IN PARTICULAR BECAUSE OF THE CONCERN OVER EAGLE FATALITIES.
IF IT WORKS ON EAGLES IT'S POSSIBLE AND LIKELY IT WOULD WORK ON RAPTORS AND SO FORTH.

>>CHRISTY JOHNSON-HUGHES:GREAT.
THANK YOU.
AND WE HAVE ONE MORE QUESTION.
DO YOU THINK THAT THE LAND BASED WIND ENERGY GUIDELINES WILL GIVE THE OPPORTUNITY TO COLLECT MORE DATA THAT SEEMS TO BE NEEDED?
WHAT DO WE THINK ABOUT THAT?
>>DALE STRICKLAND: AGAIN I THINK THAT THE TIERED APPROACH WHICH THE GUIDELINES RECOMMEND IS A WAY OF FOCUSING DATA COLLECTION

ON THOSE AREAS WHERE THE MOST
UNCERTAINTY EXIST.
IT'S A COMBINATION OF WHERE THE
RISK HIGHEST AND THE UNCERTAINTY
THE GREATEST AND AS LONG AS YOU
IMPLEMENT THE GUIDELINES THAT
WAY IT WILL IMPROVE THE AMOUNT
OF INFORMATION COLLECTED TO
ANSWER THOSE QUESTIONS THAT
ARE MOST IMPORTANT.
THE GUIDELINES WILL NOT BE AS
EFFECTIVE IN DOING THAT IF A
COMPANY HAS TO COLLECT ALL OF
THE INFORMATION THAT THEY HAVE
EVER COLLECTED AT ANY SITE FROM
NOW ON BECAUSE THAT IS NOT THE
APPROACH THE GUIDELINES
RECOMMEND AND THAT'S NOT THE
MOST COST-EFFECTIVE APPROACH.
OF GIVE YOU AN EXAMPLE.
IF THERE IS A RECOMMENDATION FOR
LET'S SAY RAPTOR NEST SEARCHES
IN THE SPRING AND IF THERE'S VERY
LITTLE HABITAT AND IT IS VERY
UNLIKELY THAT THE NESTING
POPULATIONS WOULD BE AT RISK
FROM A PARTICULAR PROJECT,
THERE IS REALLY NO POINT IN DOING
A WRAPPED OF NEST SURVEY EVEN
THOUGH THEY NORMALLY ARE DONE.
SO THE ADVANTAGE OF THIS TIERED
APPROACH RISK-BASED TIERED
APPROACH IS THAT IF YOU HAVE
ENOUGH INFORMATION TO MAKE A
DECISION ABOUT WHETHER A
RESOURCE IS AT RISK OR NOT, THEN
YOU DO NOT HAVE TO COLLECT MORE
INFORMATION.
FOCUS YOUR ATTENTION IF IT'S
MISSING AND WHERE THE
UNCERTAINTY IS GREATEST FOR A
SPECIES OF CONCERN THAT IS
THOUGHT TO BE AT RISK.
>>CHRISTY JOHNSON-HUGHES: I
WOULD LIKE TO TAKE THAT QUESTION

IN A DIFFERENT DIRECTION AND THIS GOES BACK TO SOMETHING I KNOW THAT WE HAVE TALKED ABOUT CRIS ABOUT THE VALUE OF PRECONSTRUCTION STUDIES AND BUILDING OUR KNOWLEDGE BASE OF BAT.
WE HAVE A DEARTH OF KNOWLEDGE THERE.
TELL US A LITTLE BIT ABOUT YOUR EXPERIENCE WITH THE VALUE OF A PRECONSTRUCTION STUDY.
>>CRIS HEIN: PRECONSTRUCTION STUDIES, I MENTIONED IN THE PRESENTATION THERE ARE TWO MAIN POINTS ARE TRYING TO GET OUT.
ONE IS ACTIVITY PATTERNS OF BATS, WHENEVER THE MOST ACTIVE ACROSS THE LANDSCAPE, AT DIFFERENT ALTITUDES OR OTHER WEATHER CONDITIONS.
THE OTHER IS TO TRY TO PREDICT RISK OF A SITE.
WE DON'T HAVE ENOUGH INFORMATION REALLY TO MAKE -- TO SAY THAT ACOUSTIC DATA CAN OR CANNOT BE USED TO ASSESS RISK.
BUT, THE OTHER PART, THE VALUE RIGHT NOW IS IT GIVES US INSIGHT INTO THESE ACTIVITY PATTERNS AND THAT ACTIVITY TENDS TO TRACK WELL WITH FERTILITY PATTERNS -- FATALITY PATTERNS AND WHEN THE HIGHEST FATALITIES OCCUR SO I SEE VALUE IN THAT AND PARTICULARLY WHERE WE DON'T HAVE A LOT OF INFORMATION.
>>: IN LOOKING AT THE FATALITY DATA THAT CURRENTLY EXIST, EVEN THOUGH WE CANNOT PREDICT PRECISELY WHAT FATALITIES WILL BE LIKE BASED ON ACOUSTICS, WE HAVE LEARNED THAT FOR SITES THAT SHOW A LOT OF THAT ACTIVITY BASED ON ACOUSTIC DATA THOSE

SITES HAVE HIGHER FATALITY RATES
THAN THE SITES WHERE ACOUSTIC
ACTIVITY IS QUITE LOW.
SO IT'S NOT A PRECISE ESTIMATOR,
BUT IT DOES SUGGEST WHETHER A
SITE IS GOING TO THE HIGH RISK SITE
OR LOW RISK SITE.
>>CHRISTY JOHNSON-HUGHES:
THANK YOU.
I THINK THAT IS VERY INTERESTING
INFORMATION AND HELPS BUILD OUR
KNOWLEDGE BASE EVEN THOUGH WE
MAY NOT HAVE THE POPULATION
LEVEL IMPACT.
AT LEAST WE ARE STARTING TO GET
SOME DATA THAT WE DID NOT HAVE
PREVIOUSLY.
WE ARE GOING TO TAKE ONE LAST
QUESTION.
WHEN DO YOU EXPECT WE WILL
KNOW MORE ABOUT WHETHER
FACTORS AFFECTING THAT THAT RISK
SUCH A STORM FRONT, WIND
DIRECTION DURING FALL MIGRATION
MOVEMENT AND REDUCED ACTIVITY
PERIODS DURING PRECIPITATION?
>>CRIS HEIN: A LOT OF DATA ARE
BEING COLLECTED NOW AND HAVE
BEEN COLLECTED.
WE FOCUSED ON WIND SPEED AND
TEMPERATURE.
WE HAVE USED WIND SPEED
PRIMARILY FOR THE OPERATIONAL
MITIGATION STUDIES YOUR THERE
ARE SOME THAT ARE
INCORPORATING TEMPERATURE AND
TRY TO FIND TWO OR OPTIMIZE THE
STUDY AND AS WE COLLECT SOME
OTHER INFORMATION, WE CAN
NARROW THE AMOUNT OF TIME THAT
TURBINES HAVE TO CHANGE THEIR
OPERATION AND PIN POINT WHEN WE
CAN MAXIMIZE WIND ENERGY
MIGRATION AND THE STUDIES ARE
ONGOING.

A LOT OF TIMES THEY VARY FROM SITE TO SITE SO IT'S HARD TO GET A LARGE SCALE, A REGIONAL ASSESSMENT OF THIS PARTICULAR CONDITION CAN BE APPLIED AT ALL SITES.
>>CHRISTY JOHNSON-HUGHES: ABSOLUTELY.
AND, OF COURSE,, THAT INFORMATION IS ALSO BEING USED IN BIRD STUDIES FOR BIRD MIGRATION AND ASSESSING RISKS FOR THEM AS WELL.
WHAT WE WOULD LIKE TO DO NOW IS MOVE TO A FIVE MINUTE BREAK.
WHEN WE RETURN, WE ARE GOING TO JOIN ALICIA KING AND TALK ABOUT THE NEW CONSERVATION PLAN GUIDANCE.
THANK YOU VERY MUCH.
>>CHRISTY JOHNSON-HUGHES: I THINK THAT WAS A REALLY GOOD ROUND TABLE DISCUSSION.
WE WOULD LIKE TO MOVE ONTO A DISCUSSION ABOUT THE NEW EAGLE CONSERVATION PLAN GUIDANCE.
TO LEAD US THROUGH THAT IS ALICIA KING WHO IS ALSO WITH THE FISH AND WILD LIFE SERVICE AND SHE IS PART OF THE MIGRATORY BIRD MANAGEMENT PROGRAM.
SHE IS THE COMMUNICATION COORDINATOR FOR THE MIGRATORY BIRD PROGRAM AND SHE IS ALSO THE NATIONAL COORDINATOR OF THE URBAN BIRD TREATY CITY PROGRAM HERE SHE HAS WORKED EXTENSIVELY ON WIND AND MIGRATORY BIRD ISSUES.
SO ALICIA.
>>ALICIA KING: THANKS CHRISTIE.
OF ALL OF AMERICA'S WILDLIFE EAGLES HOLD A SPECIAL PLACE IN OUR HISTORY AND CULTURE AS OUR NATION MOVES FORWARD WITH THE

DEVELOPMENT OF WIND ENERGY IT BECAME APPARENT THAT WE NEEDED TO HAVE GUIDANCE AND SUGGESTIONS FOR THE PROTECTION OF EAGLES.
THE EAGLE CONSERVATION PLAN GUIDANCE WAS CREATED TO BE IN ACCORDANCE WITH SECURE RENEWABLE ENERGY DEVELOPMENT IS COMPATIBLE EFFICIENT WHILE LET CONSERVATION.
SO THE EAGLE CONSERVATION PLAN GUIDANCE RECOGNIZES THAT BALD AND GOLDEN EAGLES ARE PROVIDED PROTECTION UNDER SEVERAL STATUTES.
THE EAGLE ACT AND THE MIGRATORY BIRD TREATY ACT.
SO IN 2009 THE SERVICE CREATED REGULATION AUTHORIZED ISSUANCE OF PERMITS FOR NON-PURPOSEFUL TAKE OF EAGLES.
THESE PERMIT APPLICATIONS ARE FOR THE NON-PURPOSEFUL EAGLE TAKE AND REQUIRE THAT DEMONSTRATION OF AVOIDANCE AND MINIMIZATION AS A POTENTIAL TAKE IS EQUAL TO THE EXTENT PRACTICABLE AND THAT PROGRAMMATIC TAKE PERMITS, TAKE MUST BE UNAVOIDABLE.
THE EAGLE CONSERVATION PLAN GUIDANCE DESCRIBES THE PROCESS WHERE WIND ENERGY DEVELOPERS IN COORDINATION WITH THE SERVICE COLLECT AND ANALYZE INFORMATION THAT MAY ACTUALLY LEAD TO A PROGRAMMATIC PERMITS.
IT IS INCREDIBLY IMPORTANT THAT THERE BE A A LOT OF COMMUNICATION AND COORDINATION WITH THE SERVICE AS WE MOVE THROUGH THE EAGLE CONSERVATION PLAN GUIDANCE.
THE EAGLE CONSERVATION PLAN

GUIDANCE ASSESSES RISKS.
IT EVALUATES THE RISK OF A PROJECT TO EAGLES AND AT PROGRESSIVE STAGES OF PLANNING AND DEVELOPMENT.
SO TAKING INTO CONSIDERATION THE RISK FACTORS AND KNOWING THAT A LOT IS STILL UNKNOWN FOR THE RISK TO EAGLES, BUT THINKING ABOUT IS THE RISK SUBSTANTIAL AND NOT LIKELY TO BE MANAGEABLE?
IS THERE A LIKELIHOOD IT WILL TAKE, BUT AT A MANAGEABLE LEVEL AND IS EAGLE TAKE UNLIKELY?
TAKING INTO CONSIDERATION THAT AT ANY POINT DURING THE DEVELOPMENT THE STATUS OF THE SITE COULD CHANGE SO IT COULD CHANGE FROM UNLIKELY, TO LIKELY TO BE A PROBLEM FOR EAGLES, OR VICE VERSA.
SO THIS RISK IS IMPORTANT TO ASSESS THROUGHOUT THE PLAN OF THE GUIDANCE.
IT IS A DECISION-MAKING PROCESS AND THE GUIDANCE OUTLINES THAT DECISION-MAKING PROCESS BY GATHERING INFORMATION AT EACH STAGE OF PROJECT DEVELOPMENT AND INCREASING LEVEL OF DETAIL AT EACH OF THOSE STAGES.
SO THE APPROACH PROVIDES A FRAMEWORK FOR MAKING DECISIONS SEQUENTIALLY IN PROJECT DEVELOPMENT FOR LOOKING AT SITING, CONSTRUCTION, AND OPERATIONS.
SO THE DECISION-MAKING PROCESS TAKES INTO CONSIDERATION ALL OF THE STAGES OF DEVELOPMENT AND THE THINGS THAT NEED TO BE HIGHLIGHTED AS YOU MOVE FORWARD WITH THE PROJECT.
THE EAGLE CONSERVATION PLAN GUIDANCE OUTLINES THIS

DECISION-MAKING PROCESS AND IT PROVIDES RECOMMENDATIONS FOR THE DEVELOPMENT OF EAGLE CONSERVATION PLANS.
SO IT'S SUPPORTS ISSUANCE OF EAGLE PROGRAM TO TAKE PERMITS AND REQUIRE SCIENTIFICALLY RIGOROUS STUDIES AND SURVEYS, MONITORING, RISK ASSESSMENT, AND RESEARCH.
AND IS PROPORTIONAL TO RISK TO BOTH BALD AND GOLDEN EAGLES.
SO THESE RISK FACTORS TAKE INTO CONSIDERATION THAT WE DON'T KNOW EVERYTHING WE WOULD LIKE TO KNOW ABOUT EAGLES AND THEIR VULNERABILITY TO COLLISIONS WITH WIND TURBINES.
BUT IT'S IMPORTANT TO LOOK AT EAGLE ABUNDANCE, THE PRESENCE OF FEATURES OR CIRCUMSTANCES THAT DECREASE AND EAGLES ABILITY TO PERCEIVE AND AVOID COLLISIONS.
ALL OF THESE RISK FACTORS AND MORE ARE OUTLINED IN THE GUIDANCE SO THAT THE DEVELOPMENT CAN REALLY TAKE INTO CONSIDERATION SOME FACTORS THAT NEED TO BE LOOKED AT.
SO THE GENERAL APPROACH REALLY LOOKED AT ADDRESSING MOST DIRECT MORTALITY AND DISTURBANCE, STRUCTURES THAT CAN CAUSE DIRECT MORTALITY THROUGH COLLISION, ACTIVITIES ASSOCIATED WITH PRECONSTRUCTION, CONSTRUCTION, OR OPERATION AND MAINTENANCE.
AND THE DISTURBANCE OR MORTALITY OF FACTS THAT MAY BE PERMANENT IN THE EAGLES.
SO LOOKING AT THAT GENERAL APPROACH AND BEING ABLE TO FOLLOW THROUGH ALL OF THE STEPS

THROUGHOUT THE GUIDANCE ARE IMPORTANT TO REALLY LOOK AT THE ASSESSMENT OF THOSE RISKS.
SO THE EAGLE CONSERVATION PLAN GUIDANCE ASSESSES RISK THROUGH EARLY PRECONSTRUCTION ASSESSMENT IDENTIFYING IMPORTANT EAGLE USE AREAS, ANALYZING PRECONSTRUCTION INFORMATION TO ESTIMATE POTENTIAL IMPACTS AND THEN A AVOIDING, MINIMIZING AND/OR REDUCING FOR POTENTIAL ADVERSE EFFECTS TO EAGLES.
AND ALSO MONITORING FOR IMPACTS DURING CONSTRUCTION AND OPERATION PHASES OF THE CONSTRUCTION.
PART OF ASSESSING THE RISK, PROJECT DEVELOPERS OR OPERATORS PREPARE AND EAGLE CONSERVATION PLAN OR SIMILAR DOCUMENT.
IT OUTLINES THE PROJECT DEVELOPMENT PROCESS AND INCLUDES CONSERVATION AND MONITORING PLANS.
THIS IS IMPORTANT COMPONENT FOR ASSESSING THE RISK FOR THESE EAGLE CONSERVATION PLANS.
IF INFORMATION WARRANTS FURTHER CONSIDERATION OF A POTENTIAL SITE, ON-SITE SURVEY SHOULD BE IMPLEMENTED TO DOCUMENT THE USE OF AREA BY EAGLES.
CONSIDERING THE AREA USE OF EAGLES IS AN IMPORTANT THING TO CONSIDER AS A POTENTIAL POSSIBLE SURVEY THAT MAYBE NEEDED.
THE GOALS OF SURVEY QUANTIFY AND DESCRIBE THE USE OF PROJECT AREA BY BREEDING AND NON-BREEDING EAGLES AND THROUGHOUT THE YEAR AND INTO

MULTIPLE YEARS.
THE CUMULATIVE EFFECTS ANALYSIS CONSIDERS PROJECT RISKS IN CONTEXT TO OTHER FACTORS THAT MAY AFFECT LOCAL EAGLE POPULATION.
GOING BACK TO CONSIDERING THE WHOLE AREA AND USE BY THAT AREA OF THE EAGLES.
ONE OF THE MOST IMPORTANT COMPONENTS ABOUT THE EAGLE CONSERVATION PLAN GUIDANCE IS EARLY PLANNING.
SO COMPREHENSIVE A EARLY PLANNING CAN IDENTIFY MEASURES THAT AVOID AND MINIMIZE EFFECTS AND FACILITATE OPTIONS FOR COOPERATIVE, COMPREHENSIVE NEPA ANALYSIS AND THIS EARLY ON COORDINATION IS INCREDIBLY IMPORTANT THROUGHOUT THE WHOLE SITE SO AT THE BEGINNING, THE MIDDLE AND AT THE SITE PROJECTED FORWARD.
THE EAGLE CONSERVATION PLAN GUIDANCE WORKS ALONGSIDE THE WIND ENERGY GUIDELINES AND IT FOLLOWS ALONG IN STAGES ALONG WITH THE TEARS THAT THE WIND ENERGY GUIDELINES.
SO TIER 3 AND TIER TWO FOLLOW ALONG WITH STAGE ONE, THIS INCORPORATES STAGES TWO, THREE AND FOUR OF THE EAGLE CONSERVATION PLAN GUIDANCE AND ETC.
SO WITHIN THE EAGLE CONSERVATION PLAN GUIDANCE, THE STAGES AND TIERS ARE EASY TO ALIGN.
THE EAGLE CONSERVATION PLAN GUIDANCE DOES NOT IMPOSE ADDITIONAL REGULATORY OR GENERALLY BINDING REQUIREMENTS.
WHILE WE DO HAVE TO ADHERE TO

THE PROTECTION OF EAGLES
THROUGH THE EAGLE
CONSERVATION PROTECTION ACT IN
THE MIGRATORY BIRD TREATY ACT,
THERE ARE NO ADDITIONAL
REGULATORY OR BINDING
REQUIREMENTS THAT COME FROM
THE EAGLE CONSERVATION PLAN
GUIDANCE.
THE EAGLE CONSERVATION PLAN
GUIDANCE CERTAINLY DOES PROVIDE
INTERPRETATIVE GUIDANCE AND
ALLOWS FOR PROJECT COMPONENTS
TO BE ABLE TO WORK WITH SERVICE
BIOLOGISTS AND OTHERS WORKING
THROUGH THE STEPS OF THE EAGLE
CONSERVATION PLAN GUIDANCE.
WE HAVE TIME FOR SOME
QUESTIONS.
JOINING US FROM ALBUQUERQUE
NEW MEXICO VIA TELEPHONE IS
BRIAN MILSAT.
BRIAN IS GOING TO JOIN ME IN
ANSWERING SOME QUESTIONS AND
WE HAVE A FEW UP ON THE BOARD
ALREADY.
SO GOOD AFTERNOON BRIAN AND
WELCOME.
>>: HELLO.
CAN YOU HEAR ME OKAY?
>>ALICIA KING: I CAN.
THANK YOU FOR JOINING US TODAY.
SO BRIAN, I DID NOT KNOW IF YOU
HAD ANYTHING EXTRA TO ADD AFTER
MY PRESENTATION OR IF YOU WANT
TO JUMP RIGHT INTO THE QUESTION.
>>: THE ONLY THING I WOULD ADD
AND YOU TOUCHED ON IT AT THE END
IS THE EAGLE CONSERVATION PLAN
GUIDANCE IS A SPECIALIZED SUBSET
OF THE WIND ENERGY GUIDELINES.
THE WIND ENERGY GUIDELINES ARE
GENERALLY TALK ABOUT THE
GENERAL APPLICATION OF
TECHNIQUES TO ASSESSING THE

IMPACTS OF WIND ON WILDLIFE AND EAGLES ARE A SMALL SUBSET OF THAT AND, OF COURSE, THERE IS MUCH MORE DETAIL BECAUSE THEY ARE A SUBSET THAT YOU TOUCHED ON THAT BUT THAT'S ONE OF THE IMPORTANT POINTS TO KEEP IN MIND THAT THEY ARE DESIGNED TO RELATE TO ONE ANOTHER AND INTEGRATE WITH ONE ANOTHER.
>>ALICIA KING: THANKS BRAIN.
SO ONE OF THE FIRST QUESTIONS WE RECEIVED FROM A VIEWER IS WHAT DEFINES AN EAGLE USE AREA?
I MENTIONED DURING MY PRESENTATION EQUAL USE AREA AND THAT WAS SOMETHING TO BE AWARE OF.
CAN YOU GO INTO A LITTLE MORE DETAIL ABOUT THE EAGLE USE AREA?
>>BRIAN MILLSAP: HAPPY TO.
WE ACTUALLY HAVE THE REGULATORY DEFINITION OF AN IMPORTANT EAGLE USE AREA IN THE CODE OF FEDERAL REGULATIONS AND I WILL READ THAT SO I DON'T GET IT WRONG.
BUT THAT REGULATORY DEFINITION OF AN IMPORTANT EAGLE USE AREA IS AN EAGLE NEST OR COMMUNAL ROOST SITE THAT EAGLES RELY ON FOR READING SHELTERING OR FEEDING AND THE LANDSCAPE FEATURES SURROUNDING SUCH A VAST, FORGING AREA OR ROOST SITE ESSENTIAL FOR THE VIABILITY OF BREEDING, FEEDING OR SHELTERING EAGLES.
AS WE WORK ON THE EAGLE CONSERVATION PLAN GUIDANCE, WE REALIZE THAT THAT REGULATORY DEFINITION LEFT OUT A FAIRLY IMPORTANT EAGLE USE AREA AND SO IN THE GUIDANCE, WHEN YOU SEE IMPORTANT EAGLE USE AREA WE

FOLLOW IT BY AN IMPORTANT EAGLE CONSERVATION SITE.
SO FOR THE PRACTICAL PURPOSES AN IMPORTANT EAGLE USE AREA IS ALL THOSE THINGS I JUST MENTIONED NAST, FORGING AREA, COMMUNAL ROOST AS WELL AS AREAS WHERE BALD OR GOLD EAGLES CONCENTRATED IN MIGRATION IN THE FALL OR SPRING.
>>ALICIA KING: GREAT.
THANK YOU.
ANOTHER QUESTION WE HAVE IS WHAT OTHER FACTORS CONTRIBUTE TO INCREASED RISK OF COLLISIONS BY EAGLES?
I MENTIONED A FEW THINGS THAT WERE RISK FACTORS CONTRIBUTING TO COLLISIONS BY EAGLES.
WHAT CAN YOU THINK OF A FEW ADDITIONAL RISK FACTORS?
>>BRIAN MILLSAP: I COULD CERTAINLY HYPOTHESIZE WHAT SOME MAY BE AND WE GET INTO THAT A LITTLE BIT IN THE GUIDANCE, BUT I WILL POINT OUT THAT ONE OF THE REAL DEFICIENCIES WITH EAGLES IS THAT WE DON'T HAVE A LOT OF SOLID SCIENTIFIC INFORMATION IN THE LITERATURE.
I WAS LISTENING TO CRIS TALK ABOUT BATS A FEW MINUTES AGO AND THE LEVEL OF SCIENTIFIC RESEARCH THEY'VE BEEN ABLE TO ACCOMPLISH THERE AND LEARNING IS FAR BEYOND WHAT WE HAVE PRESENTLY FOR EAGLES.
BUT I THINK MOST OF US BELIEVE THAT THE RISK TO EAGLES IS NOT JUST RANDOM IN UNIFORM ACROSS THE LANDSCAPE.
THERE ARE PLACES IN CIRCUMSTANCES WHERE THE RISK IS LIKELY HIGHER AND THAT INCREASED RISK IS PROBABLY ASSOCIATED WITH

FACTORS THAT CAUSED EAGLES TO
BE DISTRACTED.
WHEN YOU ARE NEAR NEST SITES
AND TERRITORY BOUNDARIES WHERE
INDIVIDUALS ARE LIKELY TO BE
CHASING ONE ANOTHER AROUND,
NEAR BALD EAGLE NIGHT RISK
WHERE THERE'S SOCIAL
INTERACTION BETWEEN THE BIRDS
AND IN LOCATIONS WHERE EAGLES
ARE FORAGING AND THEY ARE
PAYING ATTENTION TO RABBITS AND
GROUND SQUIRRELS AND NOT
THINKING ABOUT OTHER FEATURES IN
THE AIR AROUND THEM, THE
GENERAL FEELING IS THOSE
FACTORS PROBABLY INCREASED RISK
AND EAGLES OF BEING STRUCK
THROUGH REALLY NOTHING MORE
THAN JUST DISTRACTING THEM FROM
PAYING ATTENTION.
BUT AGAIN, THOSE THINGS HAVE NOT
BEEN TESTED AND THEY ARE SOME
OF THE FACTORS WE REALLY HOPE
TO EVALUATE UNDER PERMITS
ISSUED THROUGH THE EAGLE
PROGRAMMATIC TAKE PERMIT
REGULATIONS.
>>ALICIA KING: GREAT.
THANKS BRAIN.
SO WE HAVE A STATEMENT AND/OR
QUESTION AND I WILL READ THIS TO
YOU AND SEE WHAT DO YOU THINK
ABOUT THIS.
SO STANDARDIZING
PRECONSTRUCTION PROTOCOLS
WOULD PROVIDE SOME
PREDICTABILITY, BUT IT SHOULD BE
PHRASED AS A QUESTION BECAUSE
EVERY SITE IS DIFFERENT.
SO IT SHOULD BE CASE-BY-CASE AND
NON-BINDING.
>>BRIAN MILLSAP: I THINK THAT IS
VERY CONSISTENT WITH THE WAY
THE GUIDANCE HAS BEEN

IMPLEMENTED.
BOTH FOR THE REASONS THAT WERE SUGGESTED BY THE AUTHOR OF THE QUESTION THAT EVERY CASE IS DIFFERENT AND WE NEED TO HAVE SOME FLEXIBILITY THERE.
THE OTHER PROBABLY MORE PRACTICAL REASON WHY WE HAVE TO MAINTAIN FLEXIBILITY IS IN THE EXISTING REGULATIONS WE DON'T SPECIFY EXACTLY THE KINDS OF SURVEYS AND METHODS THAT NEED TO BE USED TO WE CANNOT COME IN IN GUIDANCE AND IMPOSE THOSE ADDITIONAL REQUIREMENTS, BUT I THINK ASIDE FROM THAT LEGAL TECHNICALITY, THE AUTHOR OF THAT QUESTION IS RIGHT, EVERY SITE IS DIFFERENT.
THERE'S LOTS OF UNIQUE FEATURES AND XBOX AND IN SOME CASES WINTERING EAGLES WERE CONCERNED ABOUT ANOTHER'S MIGRATORY EAGLES AND OTHERS IT MAY BE NESTING POPULATIONS AND THE APPROACH YOU MIGHT TAKE FOR PRECONSTRUCTION SURVEYS FOR EACH OF THOSE IS DIFFERENT.
SO I AGREE WITH THE TONE OF THAT STATEMENT AND IT'S VERY CONSISTENT WITH HOW WE'VE DEVELOPED BUT THAT IN SO FAR.
>>ALICIA KING: AND CERTAINLY THAT IS WHERE REGULAR COMMUNICATION WITH SERVICE THAN OTHER FOLKS THROUGH THIS WHOLE PROCESS CAN BE VERY BENEFICIAL AND HELPFUL IN CONVERSATION ABOUT THE WHOLE PROCESS AS IT MOVES THROUGH A PARTICULAR PROJECT.
>>BRIAN MILLSAP: ABSOLUTELY AND I WILL JUST REITERATE THAT.
I THINK THE EARLIER CONVERSATIONS ON THE WIND

ENERGY GUIDELINES HIGHLIGHTED
THAT THE IMPORTANCE OF
COMMUNICATION BETWEEN THE
PROJECT PROPONENTS AND THE
SERVICE AS WELL AS OTHER
REGULATORY AGENCIES EARLY AND
OFTEN.
THAT ABSOLUTELY HOLDS TRUE WITH
THE EAGLE CONSERVATION PLAN
GUIDANCE AS WELL.
DALE MADE SOME VERY GOOD
COMMENTS ABOUT THE KIND OF
STRATEGIC EFFICIENT DESIGN OF
SURVEYS SO YOU ARE COLLECTING
WHAT YOU NEED BUT NOT MORE
THAN YOU NEED.
AND THAT EARLY COMMUNICATION IS
FUNDAMENTAL TO US AND THE
PROJECT PROPONENTS.
HONING IN ON WHAT THE REAL
ISSUES ARE IN ENSURING THE DATA
BEING COLLECTED FOCUS ON THOSE
AND DON'T MEASURE THINGS THAT
REALLY NONE OF US ARE
CONCERNED ABOUT ON A
PARTICULAR SITE.
>>ALICIA KING: GREAT.
THANKS BRIAN.
AND ADDRESSING SOMETHING WE
HAVE ALREADY TOUCHED ON IN MY
PRESENTATION I DID MENTION THERE
ARE SON -- SOME UNKNOWN ABOUT
EAGLES THAT WE DON'T KNOW AND
CERTAINLY THE RESEARCH AND
GATHERING OF DATA IS IMPORTANT
IN HELPING US GAIN SOME OF THAT
KNOWLEDGE.
THE NEXT QUESTION SAYS WHAT DO
WE KNOW ABOUT BATS THAT WE
DON'T KNOW ABOUT EAGLES?
I DON'T KNOW WE CAN REVERSE THAT
AND SAY ARE THERE THINGS WE
WANT TO KNOW ABOUT EAGLES THAT
WE HAPPEN TO KNOW ABOUT BATS.
I GUESS BRIAN, IF YOU COULD THINK

OF THINGS THAT WE COULD DO TO INCREASE OUR KNOWLEDGE OF EAGLES TO HELP US IN PREVENTING COLLISIONS, HOW DOES THAT RELATE TO WHAT WE KNOW ABOUT BATS?
>>BRIAN MILLSAP: THAT IS A GREAT QUESTION.
I THINK WITH BATS, AS CRIS JUST ARTICULATED, WE HAVE BEEN ABLE TO EVALUATE, SEE POTENTIAL EFFECTS OF CHANGES IN CUT IN SPEED IN REDUCING FATALITY RATES AND WE HAVE BEEN ABLE TO SHOW THAT HIGHER WIND SPEEDS ARE ASSOCIATED WITH LOWER BATS EXPOSURE.
AND THOSE ARE SOME BASIC THINGS THAT WE EXPECT TO OPERATE FOR EAGLES AS WELL.
NOT THE SAME FACTORS THAT THAT THERE ARE FACTORS OUT THERE THAT AS I MENTIONED THAT ARE ASSOCIATED WITH HIGHER RISK FOR LOWER RISK AND MY UNDERSTANDING THOSE FACTORS BETTER AND TAKING THEM INTO CONSIDERATION IN THE DESIGN OF A PROJECT, THROUGH MICRO- CITING ADJUSTMENTS OF TURBINES WE ARE ABLE TO SUBSTANTIALLY REDUCE RISK TO EAGLES AND ALLOW PROJECTS TO GO FORWARD EVEN IN PLACES WHERE EAGLE USE MAY BE RELATIVELY HIGH.
SO I THINK, FOR A COUPLE OF REASONS WE BEEN ABLE TO MAKE MORE PROGRESS WITH BATS THAN EAGLES.
FIRST, IS, AND I WILL JUST SAY THIS DIRECTLY WITH EAGLES, TAKE IS A VIOLATION OF FEDERAL LAW.
CURRENTLY THERE ARE NO PERMITS OUT THERE FOR TAKE OF EAGLES ED WIND FACILITIES.
SO THERE IS THAT 6,000-POUND

GORILLA IN THE ROOM IN THAT WERE EAGLES ARE TAKEN AND WE COULD LEARN FROM THOSE INSTANCES OF TAKE, THEY ARE ALSO IN LEGAL ACTS AND THEREFORE, THERE HAS BEEN CONCERN OVER DISCLOSING AND REVEALING THOSE.
SO WE HAVE SOME IMPEDIMENT TO EAGLE RESEARCH THAT WE DON'T HAVE WITH NON-LIST OF BAD RESEARCH.
THOSE ARE SOME THINGS WE NEED TO WORK THROUGH.
THE OTHER FACTOR IS EAGLE FATALITIES ARE RARE EVEN AT THE MOST FREQUENT SITES THAT WE HAVE EAGLE FATALITIES, THEY ARE STILL FAIRLY RARE EVENTS.
AND ACTUALLY CALCULATING, DETECTING AND LEARNING FROM EAGLE FATALITIES AND IDENTIFYING THESE RISK FACTORS IS A SLOW LABORIOUS PROCESS GIVEN THE RARITY WITH WHICH THEY OCCUR.
THERE ARE SOME WAYS WITH WITH WELL-DESIGNED RESEARCH WE CAN EXPEDITE THAT LEARNING AND WE ARE WORKING WITH PARTNERS IN STATE AND FEDERAL FACILITIES AND AGENCIES TO DO THAT.
BUT, THE RESEARCH ON BAT IS PROGRESSING FURTHER THAN THE RESEARCH ON EAGLES FOR REALLY THOSE TWO REASONS PRIMARILY.
>>ALICIA KING: THANKS BRIAN.
ONE OF THE QUESTIONS WE DID RECEIVE WAS HAVE ANY EAGLE TAKE PERMITS BEEN ISSUED FOR A WIND PROJECT YET AND YOU ANSWER THAT AND THE SECOND PART WAS IF NOT, WHEN DO WE EXPECT THE FIRST TO BE ISSUED.
AS YOU HAVE SAID, THERE IS CERTAINLY A LOT OF WORK THAT NEEDS TO BE DONE WHEN YOU ARE

THINKING ABOUT APPLYING FOR A PERMIT AND GOING THROUGH THE GUIDANCE AND CREATING THE EAGLE CONSERVATION PLAN AND SO FORTH.
SO I DON'T THINK WE CAN ACTUALLY -- WE DON'T HAVE A CRYSTAL BALL AND WE CAN'T PUT A PROJECTION ON WHEN WE MIGHT SEE THOSE FIRST PERMITS BEING ISSUED.
I DON'T KNOW IF YOU WANT TO ADD ANYTHING TO THAT OR NOT.
>>BRIAN MILLSAP: ONLY THAT AS MANY FOLKS ON THE CALL WHO ARE WORKING ON EAGLE PERMITS KNOW, THERE ARE A NUMBER OF PROJECTS THAT ARE MOVING TO THE PIPELINE AT VARIOUS STAGES.
WHEN ANY ONE OF THOSE WILL REACH THE POINT OF PERMIT BEING ISSUED IS HARD TO PREDICT.
BUT THERE ARE MORE THAN A DOZEN PROJECTS THAT ARE KIND OF ON THAT TRACK.
SO THAT IS REALLY ALL I CAN SAY ABOUT ONE.
>>ALICIA KING: THANKS BRIAN.
AND THEN WE ARE BEING ASKED FOR AN UPDATE ON THE STATUS OF THE USGS FUNDED EFFORTS TO USE GPS, GSM COLLAR DATA TO BUILD COLLISION RISK MODELS AND ANY PLANNED INTEGRATION OF THIS RESEARCH WITH THE WIND ENERGY GUIDELINES AND EAGLE CONSERVATION PLAN GUIDANCE.
>>BRIAN MILLSAP: THAT'S A GREAT QUESTION.
WE RESEARCH GOING ON IN A NUMBER OF FRONTS IN COLLABORATION WITH U.S. GSM ONE OF THOSE PROJECTS, AND IT IS ACTUALLY ALSO INVOLVING TODD KAZTNER AND HIS CREW FROM THE UNIVERSITY OF WEST VIRGINIA, BUT

IT INVOLVES THE DEPLOYMENT OF SATELLITE TRANSMITTER PARTICULARLY GSM TRANSMITTER THAT GENERATE PARTICULAR AMOUNTS OF DATA ON SHORT INTERVALS.
AND FROM THOSE DATA, WE GET REALLY RICH PICTURES OF HOW EAGLES ARE USING THE LANDSCAPE AND WIND CURRENTS AND OTHER FACTORS.
THERE IS DISCUSSION ON GOING.
ONE OF THE COMPLEXITIES OF USING THE GSM DATA AND ASSESSING RISK TO EAGLES AT A PARTICULAR PROJECT IS AS YOU CAN IMAGINE NOT EVERY EAGLE IS WEARING A GSM TRANSMITTER SO WHEN WE HAVE DATA FROM AN INDIVIDUAL EAGLE USING A PROJECT FOOTPRINT WE HAVE VERY DETAILED INFORMATION ON HOW THAT INDIVIDUAL OR THOSE INDIVIDUALS ARE USING THE PROJECT AREA.
AND THEORETICALLY COULD GENERATE FAIRLY GOOD PREDICTIONS OF THEIR RISK OF ENCOUNTERING A TURBINE.
THAT DOES NOT TELL US MUCH ABOUT THOSE OTHER EAGLES THAT ARE NOT WEARING A TRANSMITTER.
SO WE ARE FIRMLY OF THE OPINION WE CAN LEARN A LOT ABOUT HOW IT EQUALS USE AN AREA BY FOLLOWING THESE TRANSMITTER BIRDS, BUT WE STILL NEED TO ACCOUNT FOR THE FACT THAT ONLY A SMALL PROPORTION OF EAGLES AT ANY ONE SITE ARE TRANSMITTED AND THEIR OTHER EAGLES THAT MAYBE USING THIS SITE VERY DIFFERENTLY THAT ARE CONTRIBUTING TO THE RISK.
MOST OF OUR INTERNAL MODELING WAS REFERRED TO EARLIER AS THE GAMMA MODEL.

IT'S ACTUALLY THAT IS ONE OF THE DISTRIBUTIONS USED IN THE BOTTLE, BUT IT IS A MODEL WE USE BASED ON COUNTS OF EAGLES, TRANSLATED INTO EXPOSURE MEASURES OVER A PROJECT SITE.
TAKE THOSE DATA AND TRANSLATE THEM INTO A RISK TO EAGLES OVER ALL.
AND WE ARE HAVING SOME DISCUSSIONS RIGHT NOW WITH TODD KATZNER ABOUT THE POSSIBILITY OF EXPLORING HOW TO USE THE GSM DATA TO AUGMENT THAT GENERAL RISK EXPOSURE ANALYSIS.
THE OTHER THING I WILL POINT OUT ASSOCIATE WITH THE PLUMBING OF THOSE TRANSMITTERS IS THE FISH AND WILDLIFE SERVICE AND USGS HAVE INVESTED WELL OVER A MILLION 1/2 DOLLARS NOW IN THE LA TRANSMITTERS FOR EAGLES BOTH TO COLLECT THAT TYPE OF INFORMATION ON HABITAT USE BUT IN ADDITION TO COLLECT INFORMATION ON SURVIVAL RATES FOR MODELING AND ON CAUSES OF MORTALITY SO WE HAVE A BETTER UNDERSTANDING OF WHAT FACTORS OUT THERE ARE CAUSING MORTALITY TO EAGLE POPULATION SO WE CAN TARGET MITIGATION EFFORTS AS EFFICIENTLY AS POSSIBLE.
SO THE DEPTH LIMIT OF GSM AND OTHER SATELLITE TRANSMITTERS IS REALLY ADDRESSING A MULTITUDE OF INTERESTS OUT THERE WITH RESPECT TO EAGLE RESEARCH.
>>ALICIA KING: GREAT.
THANK YOU FOR THAT.
SO ANOTHER QUESTION, A LITTLE DIFFERENT TECHNICAL IS HOW DOES THE WIND ENERGY GUIDELINES TO YOUR 4 AND 5 COMPARED TO THE EAGLE CONSERVATION PLAN

GUIDANCE STAGES FOR CURRENTLY OPERATING FACILITIES WHO ARE NOT A FACILITY THAT IS PROPOSED OR KNEW BUT ONE THAT IS CURRENTLY OPERATING?
>>BRIAN MILLSAP: THAT IS A VERY GOOD QUESTION AND, OF COURSE, SINCE WE DON'T HAVE ANY PERMITS OUT THERE FOR UPCOMING OR OPERATING FACILITIES, ANSWERING THAT IS A LITTLE THEORETICAL.
BUT MOST OF US AGREE THAT AT AN OPERATING FACILITY, PARTICULARLY AN OPERATING FACILITY THAT POSES A SUBSTANTIAL RISK TO EAGLES IS THE GREATEST OPPORTUNITY FOR US TO QUICKLY LEARN ABOUT SOME OF THE RISK FACTORS AND WHAT MODIFICATIONS TO OPERATIONS OF THE PROJECT MIGHT ADDRESS THAT RISK.
SO THERE IS A LOT OF DISCUSSION RIGHT NOW ABOUT THE POSSIBILITY OF PERMITS OR THROUGH SOME OTHER MECHANISM TAKING OPERATING FACILITIES AND LEARNING AS MUCH AS WE CAN FROM THOSE AS WE IMPLEMENT FROM A TRIAL BASIS OR AN EXPERIMENTAL BASIS, EXPERIMENTAL CONSERVATION MEASURES.
AS I SAID BEFORE, WE KNOW THAT CHANGING CUT IN SPEEDS FOR BATS CAN HAVE AN EFFECT ON MORTALITY RATES AND WE WOULD LOVE TO HAVE SOME TOOLS LIKE THAT IN OUR TOOL CHEST FOR EAGLES, NOT THAT CUT IN SPEEDS NECESSARILY WOULD BE THE ONE, BUT IT MAY BE THAT HOURLY CURTAILMENTS OR SLIGHT REPLACEMENTS OR SLEIGHT OF CITING OF TURBINES, AVOIDING MYSTERIOUS, THOSE KINDS OF THINGS WOULD BE VERY EFFICIENT AND EFFECTIVE CONSERVATION

MEASURES.
WE WON'T KNOW THAT UNTIL WE'VE TESTED THOSE AT SOME SITES WHERE WE HAVE SOME EXISTING UNDERSTANDING OF WHAT THE FATALITY RATES ARE AND WHAT THOSE FATALITIES ARE ASSOCIATED WITH.
SO THAT REALLY CORRESPONDS TO THE POST- CONSTRUCTION MONITORING AND WHERE WE DON'T HAVE A DISCRETE EXPLICIT TIER FIVE IN THE EAGLE GUIDANCE, OUR STAGE FOUR WHICH IS
POST- CONSTRUCTION MONITORING AND TESTING OF CONSERVATION METHODS REALLY CORRESPONDS TO THE TIER FOUR AND FIVE OF THE WIND ENERGY GUIDELINES AND I WILL JUST CLOSE THE COMMENT BY SAYING PROBABLY THE MOST SIGNIFICANT THING WE CAN DO AND THE MOST SIGNIFICANT EFFICIENCY WE HAVE WITH EAGLES IS A CLEAR PICTURE OF WHAT REAL FATALITY RATES ARE IN PROJECTS AND EVEN MORE IMPORTANTLY, WHAT FACTORS ARE ASSOCIATED WITH THOSE FATALITIES SO LEARNING AS MUCH AS WE CAN FROM THE INSTANCES WHERE WE HAVE EAGLE DEATHS OCCURRING AT WIND FACILITIES IS A VERY HIGH PRIORITY.
AGAIN IT'S COMPLICATED BY THE FACT THAT THOSE EVENTS ARE ESSENTIALLY VIOLATIONS OF THE LAW, NOT COVERED BY PERMITS NOW AND THAT COMPLICATES THE PICTURE LITTLE BIT.
>>ALICIA KING: GREAT.
THANKS FOR THAT BRAIN.
AND CERTAINLY AGAIN THAT'S WHERE COMMUNICATION COMES INTO PLAY.
SO LOTS OF DISCUSSIONS AND COMMUNICATIONS WITH SERVICE

FOLKS.
SO I HAVE TWO QUESTIONS ON THE BOARD AND I WILL SKIP ONE AND GO TO ONE THAT RELATES TO WHAT WE WERE JUST DISCUSSING.
HAS THE ADMINISTRATION EVER FOUND OR PROSECUTED A COMPANY FOR EAGLES KILLED AT FACILITIES?
I KNOW THAT WE HAVE TALKED ABOUT THIS OFF AND ON AS FAR AS WHETHER OR NOT THERE'S ACTUALLY BEEN A FINE OR A PROSECUTION AND WE HAVE SEVERAL INSTANCES WHERE CASES ARE BEING LOOKED INTO.
DO YOU WANT TO EXAGGERATE ON THAT AT ALL OR MOVE ONTO ANOTHER QUESTION?
>>BRIAN MILLSAP: THAT IS AN AREA THAT ALTHOUGH I'M AWARE OF SOME OF THE ACTIVITY THERE I AM CERTAINLY NOT VERY WELL-INFORMED SO I PROBABLY NOT THE BEST PERSON TO ANSWER THAT QUESTION.
AT LEAST RIGHT NOW.
>>ALICIA KING: ALL RIGHT.
AND JUST SO OUR AUDIENCE KNOWS MANY TIMES WHEN CASES ARE BEING EXPLORED OR THE POSSIBILITY OF SOME KIND OF LEGAL ACTION IS BEING TAKEN IT'S SOMETHING WE REALLY DO NOT DISCUSSED PUBLICLY JUST BECAUSE OF THE NATURE OF THE INVESTIGATION AND THAT IS SOMETHING THAT IS NOT SOMETHING THAT WE TALK ABOUT OPENLY.
SO I WANT TO GO BACK TO A QUESTION THAT WAS ON THE BOARD OF LITTLE BIT EARLIER AND TALKS ABOUT SOME OF THE OPPORTUNITIES FOR MITIGATION.
WHAT ARE SOME OF THE REALISTIC OPPORTUNITIES FOR MITIGATION AS

PART OF THE EAGLE CONSERVATION PLAN GUIDANCE OTHER THAN POWER POLE RETROFIT.
>>BRIAN MILLSAP: THAT'S A GOOD QUESTION LET ME GIVE SOME BACKGROUND SO OTHERS THAT MAY NOT BE FAMILIAR WITH HOW THAT COMES INTO PLAY OR SEE HOW THAT FITS.
ONE OF THE THINGS WE HAVE DONE FOR EAGLES IS AS PART OF THE 2009 RULE THAT CREATED THIS PROGRAMMATIC PERMIT WE DID A POPULATION OF ASSESSMENT AND THAT INCLUDED AN ASSESSMENT OF SUSTAINABLE TAKE RATES FOR BOTH SPECIES OF EAGLES.
FOR BALD EAGLES OVER MOST OF THEIR RANGE IN THE UNITED STATES THE POPULATIONS ARE HEALTHY AND WE ESTIMATED THAT THERE CAN BE SOME HARVEST OF THOSE POPULATIONS IN SOME REMOVAL OF INDIVIDUALS WITHOUT RISKING CAUSING POPULATION DECLINES THAT MAY PUT THE SPECIES AT RISK.
THE EAGLE ACT ITSELF SAYS THE DEPARTMENT OF INTERIOR CAN ISSUE PERMITS FOR THE TAKE OF EAGLE AS LONG AS THEY DON'T RISK TO THE PRESERVATION OF THE EAGLE.
WE HAVE TO FIND THAT TO LONG AS OUR PERMITS DO NOT DECREASE THE NUMBER OF BREEDING PAIRS OF EAGLES AND THERE IS A COMPLEX RESUME I WE USE THAT LANGUAGE BUT SUFFICE IT TO SAY THAT ESSENTIALLY MEANS WE PRESERVE THE REPRODUCTIVE POTENTIAL OF THE SPECIES WHILE ALLOWING FLEXIBILITY TODAY.
SO FOR BALD EAGLES WE'VE ESTIMATED THERE IS SOME ALLOWABLE TAKE AND WHEN WE

LOOK AT GOLDEN EAGLES HOWEVER THE BEST DATA WE HAVE SUGGEST THE POPULATIONS HAVE BEEN STABLE FOR REALLY PROBABLY CLOSE TO THE PAST 40 YEARS AND POSSIBLY IN SOME PARTS OF THE RANGE THEY ARE DECLINING IN OTHER PARTS THEY MAY BE INCREASING, BUT ON BALANCE THE SPECIES IS STABLE AND SO WHEN WE LOOK AT IMPOSING ADDITIONAL MORTALITY AND GOLDEN EAGLES BY ISSUING TAKE PERMITS WE REALLY DON'T HAVE A BIOLOGICAL BASIS FOR ASSUMING THE SPECIES HAS THE RESILIENCY TO ABSORB THAT AT THE MORTALITY.

SO WE HAVE DETERMINED THAT THE MOMENT UNTIL WE HAVE BETTER INFORMATION THAT WE CANNOT ISSUE ADDITIONAL MORTALITY PERMITS FOR GOLDEN EAGLES UNLESS THOSE PERMITS ARE ACCOMPANIED BY MITIGATION REQUIREMENTS THAT REQUIRE YOU GO IN AND OFFSET ANOTHER PRE-EXISTING MORTALITY BY A COMPARABLE AMOUNT.

IN THE GUIDANCE THE EXAMPLE WE USED IS THAT IF WE WERE TO ISSUE WINDS PROJECT A PERMIT TO TAKE FIVE GOLDEN EAGLES OVER FIVE YEARS, ONE EAGLE PER YEAR IS OUR CONSERVATIVE ESTIMATE OF THE FATALITY RATE WHEN PROJECT A AS PART OF THAT PERMIT WOULD BE REQUIRED TO GO AND IDENTIFY AN EXISTING SOURCE OF MORTALITY WITHIN THE GENERAL FACILITY OF THAT EAGLE MANAGEMENT UNIT AS THAT TAKE THAT IS AUTHORIZED AND THEN PAID TO REDUCE AND ELIMINATE AN EQUIVALENT AMOUNT OF ONGOING BASELINE MORTALITY THE MOST OBVIOUS TOOL FOR THAT

IS RETROFITTING POWER POLES.
ELECTROCUTION REMAINS ONE OF THE LARGEST SOURCES OF MORTALITY FOR BOTH BALD AND GOLDEN EAGLES.
WE KNOW HOW TO PREVENT ELECTROCUTIONS BY PREVENTING -- RETROFITTING POWER POLE SINCE THE EARLY 19 '70s AND WE KNOW THOSE RETROFITS ARE EFFECTIVE AT ELIMINATE MORTALITY.
SO IN THE GUIDANCE WE TALK ABOUT THE IDEA OF A PROGRAMMATIC TAKE PERMITS HE HELPING TO FUND AN ELECTRIC UTILITY COMPANY TO RETROFIT POWER POLES AND WE PROVIDE A MODEL TO CALCULATE THE NUMBER OF POLLS THAT WOULD HAVE TO BE REPLACED BUT BASICALLY USING POWER POLE RETROFITTING YOU ACCOMPLISH THAT OFFSET THAT'S REQUIRED IN ORDER FOR US TO ISSUE A PERMIT THAT ALLOWS ADDITIONAL MORTALITY OF GOLDEN EAGLES.
THE AVAILABILITY OF COMPENSATORY MITIGATION OPTIONS HAS BEEN A LIMITING FACTOR.
POWER POLES ARE ONE OPTION, BUT NOT AN OPTION EVERYWHERE AND THERE ARE ADMINISTRATIVE AND LOGISTICAL REASONS THAT MAKE THAT DIFFICULT.
THERE ARE OTHER FACTORS OUT THERE THOUGH THAT ARE AFFECTING EAGLES THAT CAN BE ADDRESSED AND THROUGH SOME INNOVATIVE PARTNERSHIPS THOSE THINGS ARE BEING INVESTIGATED AND IN ONE CASE WE ARE LOOKING AT WORKING WITH THE PERMITTEE OR PERSPECTIVE PERMITTEE TO HELP PAY TO REMOVE ROAD KILL ANIMALS FROM HIGHWAYS OVER A STRETCH

OF ROAD WHERE GOLDEN EAGLES
ARE FREQUENTLY HIT BY CARS.
THEY ARE COMING IN TO FEED ON
ROAD KILL ON THE HIGHWAY AND
OCCASIONALLY ARE STRUCK BY
VEHICLES IN DOING THAT.
BY REMOVING THOSE ROAD KILLS
FROM THE HIGHWAY, TRANSFERRING
THEM TO SAFE LOCATION, THE
EXPECTATION IS WE WILL REDUCE AT
LEAST SOME HISTORICALLY ONGOING
MORTALITIES OF GOLDEN EAGLES
AND AS A RESULT OF SET SOME OF
THE MORTALITY WE WOULD
AUTHORIZE IN THE FACILITY.
ANOTHER OPTION THAT IS BEING
INVESTIGATED.
THE AMERICAN WIND WILDLIFE
INSTITUTE IS CURRENTLY
CONDUCTING SOME WORK LOOKING
AT THE POSSIBILITY OF USING
VOLUNTARY LEAD BULLET
REPLACEMENT AS A MEANS OF
OFFSETTING THE EXISTING
MORTALITY OF EAGLES.
LEAD POISONING, SECONDARY
BLOOD POISONING FROM INGESTING
BULLET FRAGMENTS FROM BIG GAME,
PRAIRIE DOG TONS WERE FARM AND
HUNTING IS GOING ON IS A
SIGNIFICANT SOURCE OF MORTALITY
FOR BALD AND GOLDEN EAGLES.
THE EXPECTATION IS BY FUNDING
VOLUNTARY BULLET REPLACEMENT
PROGRAMS WE CAN HAVE SOME
EFFECT IN REDUCING THAT
BACKGROUND MORTALITY AND THAT
OFFSET CAN BE USED TO ALLOW
PERMITS AT WIND FACILITIES.
THOSE ARE COUPLE OF THINGS WE
ARE LOOKING INTO BUT THERE
OTHER OPTIONS AS WELL.
IT COULD BE AS SIMPLE AS WE KNOW
THAT EAGLES DROWNED IN STOCK
CHANGE TANKS.

IF THAT'S BEEN SHOWN TO BE A RISK FACTOR THOSE COULD BE RETROFITTED.
WE ARE ALSO OPEN TO USING ENHANCED PRODUCTIVITY AS AN OFFSET ALTHOUGH ENHANCED PRODUCTIVITY IF YOU LOOK AT THAT FROM A DEMOGRAPHIC PERSPECTIVE PLEDGING WHEN WE ARE YOUNG DOES NOT OFFSET BUT PLEDGING A BUNCH MORE IT YOUNG MAY.
AND THEIR INSTANCES WHERE WE HAVE EAGLE NEST SITES THAT JUST FOR PHYSICAL REASONS ARE NEVER SUCCESSFUL AND THEY ARE SUBJECT TO PREDATION AND THAT NEST OVERHEATS.
SO THERE ARE SOME THINGS THAT COULD BE FUNDED IN THE WAY OF NEST SITE NOT A VACATION THAT MIGHT IMPROVE PRODUCTION IN A WAY THAT WE COULD ALSO USE THAT AS AN OFFSET FOR AUTHORIZING ADDITIONAL MORTALITY THROUGH A PROGRAMMATIC PERMIT.
ANYWAY THOSE ARE SOME OF THE THINGS WE ARE WORKING ON.
IT'S A GOOD QUESTION AND A COMPLICATED AND DIFFICULT AREA OF THE GUIDANCE.
BUT GIVEN OUR KNOWLEDGE OF GOLDEN EAGLE POPULATIONS AND ARE LIMITATIONS ON OUR BELIEF THAT WE CAN AUTHORIZE MORTALITY THAT'S WHERE WE ARE.
>>ALICIA KING: GREAT.
SO AGAIN BRIAN, IF FOLKS WHO ARE WORKING ON THESE PROJECTS WANT TO TALK TO INDIVIDUALS TO TALK ABOUT WHAT SOME OF THE OPTIONS ARE THAT OPEN COMMUNICATION AND REGULAR CONVERSATION HELPS BRING ABOUT OPPORTUNITIES THAT MIGHT NOT HAVE OTHERWISE BEEN KNOWN.

>>BRIAN MILLSAP: ABSOLUTELY AND THE KEY POINT IS WE ARE ANXIOUS TO BE FLEXIBLE HERE AND AGAIN GOING BACK TO SOMETHING I SAID EARLIER, THE SERVICE INVESTMENT IN THIS LARGE SATELLITE TELEMETRY EFFORT IN COOPERATION WITH DOZENS OF COOPERATORS ACROSS THE WESTERN U.S. ALASKA AND THE U.S. IS DESIGNED IN PART TO HELP REALLY UNDERSTAND WHAT THE MORTALITY FACTORS ARE THAT ARE OPERATING AND GOLDEN EAGLES RIGHT NOW SO WE CAN MORE EFFICIENTLY AND EFFECTIVELY IDENTIFY THESE MITIGATION OPPORTUNITIES.
>>ALICIA KING: THANKS BRIAN. ANOTHER QUESTION IS WHY IS THE EAGLE CONSERVATION PLAN GUIDANCE SILENT ON THE ENFORCEMENT DISCRETION WHILE THE WIND AND EARLY GUIDELINES ELABORATE ON WORKING WITH DEVELOPERS AND RECOGNIZING EFFORTS.
>>BRIAN MILLSAP: THAT'S A GOOD QUESTION AND THE ANSWER LIES IN THE FACT THAT UNDER THE WIND ENTERED THE GUIDELINES SPECIFICALLY IN LOOKING AT BATS AND MIGRATORY BIRDS START WITH MIGRATORY BIRDS, THERE IS A PROHIBITION ON INCIDENTAL TAKE OF MIGRATORY BIRDS UNDER THE TREATY ACT BUT THERE IS NO PERMIT AVAILABLE UNDER THAT TO AUTHORIZE THAT TAKE SO WE HAVE NO PERMIT BACK AGNES THEM FOR EFFECTING CONSERVATION MEASURES AND AUTHORIZING THE REMOVAL OF MIGRATORY BIRDS FROM THE POPULATION.
THAT LACK OF A PERMIT IS WHAT

REALLY NECESSITATES THE ENFORCEMENT DISCRETION LANGUAGE BASICALLY SAYING EVEN THOUGH WE CANNOT PERMIT YOU, YOU'VE DONE THESE GOOD THINGS IN YOUR DUE DILIGENCE, WE ARE NOT GOING TO PRIORITIZE YOU FOR ENFORCEMENT.
UNDER THE BALD AND GOLDEN EAGLE PROTECTION ACT SINCE 2009 WE'VE HAD AN INCIDENTAL TAKE PERMIT THAT AUTHORIZES US TO ISSUE PERMITS SO UNLIKE AND BPA THERE IS A CLEAR MECHANISM TO AUTHORIZE THE TAKE OF EAGLES AND AS A CONSEQUENCE WE REALLY CAN'T ABSOLVE SOMEONE OF THEIR RESPONSIBILITY TO GET A PERMIT WE HAVE UNDER THE EAGLE ACT WHAT WE LACKED UNDER THE MIGRATORY BIRD TREATY ACT.
AND THAT'S WHAT WE ARE TALKING ABOUT HERE.
>>ALICIA KING: THANKS BRIAN.
WE HAVE ONE LAST QUESTION AND THIS RELATES TO EAGLE MORTALITY HAS BEEN WELL DOCUMENTED.
HAS ANY OF THIS DATA BEEN USED OR AVAILABLE TO BE USED TO LEARN MORE ABOUT EAGLES AND I AM ASSUMING EAGLES COLLISION WITH WIND TURBINES.
>>BRIAN MILLSAP: ULTIMATELY YOU ARE RIGHT, IT HAS BEEN A SIGHT OF A TREMENDOUS AMOUNT OF RESEARCH STARTING WITH SOME OF THE RESEARCH THAT WAS DONE MORE THAN A COUPLE OF DECADES AGO WHICH STILL REMAIN SOME OF THE BEST DEMOGRAPHIC INFORMATION WE HAVE ON GOLDEN EAGLES IN THE COUNTRY BUT SUBSEQUENTLY THE WORK DONE IN LOOKING AT FACTORS AND RISKS, WE HAVE LEARNED REALLY EVERYTHING

WE DO KNOW.
WE KNOW FROM STUDIES
CONDUCTED THERE.
WE ARE AS A VERY RECENTLY
ENGAGED IN DISCUSSIONS WITH
SOME WORKS -- FOLKS DOING WORK
AT ALTAMONT TO EVALUATE SOME OF
THE THINGS I TALKED ABOUT EARLIER
LOOKING AT RISK FACTORS,
EVALUATING THE ACCURACY OF THE
SERVICES, FATALITY PREDICTION
MODELS FOR EAGLES.
WE ARE ENGAGED IN SOME
DISCUSSIONS RIGHT NOW WITH SOME
FOLKS WORKING AT ALTAMONT TO
PURSUE THAT MORE AGGRESSIVELY.
I HAVE SAID THIS, BUT I JUST WANT
TO BE CLEAR THERE IS A BROAD
NETWORK OF FOLKS WORKING WITH
THE FISH AND WILDLIFE SERVICE ON
SOME OF THESE QUESTIONS
INCLUDING A SUBSTANTIAL
INVESTMENT ON THE PART OF USGS
AND A NUMBER OF SCIENTISTS
ACROSS THE COUNTRY AND IN SOME
OF THE USGS RESEARCHERS THAT
ARE WORKING WITH SOME OF THE
FOLKS DOING WORK AT ALTAMONT TO
ANSWER OUR SPECIFIC QUESTIONS.
SO IT'S A GREAT QUESTION.
THE ANSWER IS YES, AND WE HOPE
WITHIN THE NEXT YEAR OR SO WE
WILL HAVE MADE MOST OF WHAT WE
CAN OUT OF WHAT WE'VE LEARNED
THAT ALTAMONT.
>>ALICIA KING: GREAT.
THANKS BRIAN.
I DON'T HAVE TO TELL YOU THAT SO
MANY PEOPLE ARE SO FOND OF
EAGLES.
AS I MENTIONED AT THE BEGINNING
OF THE PRESENTATION, EAGLES PLAY
SUCH A HUGE ROLE IN OUR HISTORY
IN OUR NATION AND THE CULTURAL
AWARENESS OF EAGLES AND ON

VARIOUS FRONTS SO PEOPLE CAN
BECOME VERY EMOTIONAL AND
SENSITIVE TO WHAT'S HAPPENING
WITH EAGLES.
AND I THINK YOU AND YOUR TEAM DO
A GREAT JOB OF BEING ABLE TO
HIGHLIGHT A LOT OF THE ISSUES
THAT NEGATIVELY IMPACT PEOPLE
AND CERTAINLY THE EAGLE
CONSERVATION PLAN GUIDANCE HAS
BEEN A GREAT DOCUMENT TO
REALLY ALLOW THAT INTERCHANGE
WITH SERVICE FOLKS AND RESEARCH
PEOPLE AND TRYING TO MAKE SURE
AS YOU FOLLOW THROUGH THE
STAGES IN DEVELOPING A WIND
FACILITY IS REALLY DONE IN A WAY
THAT MINIMIZES OR REDUCES OR
TOTALLY ELIMINATES THE NEGATIVE
IMPACTS OF EAGLES.
THANK YOU VERY MUCH FOR JOINING
US TODAY.
AGAIN, I KNOW YOU HAVE A LOT ON
YOUR PLATE AND I AM GLAD WE
COULD STEAL A LITTLE BIT OF YOUR
TIME TO JOIN US TODAY.
I AM GOING TO HAND THIS BACK TO
CHRISTY AND THANKS AGAIN.
>>CHRISTY JOHNSON-HUGHES:
THANK YOU ALICIA AND BRIAN.
AND AGAIN, IT'S VERY INTERESTING
THAT WITH WIND ENERGY
GUIDELINES AND THE EAGLE
CONSERVATION PLAN GUIDANCE IT'S
SO CRUCIAL AND ALL OF THIS.
IT'S COMMUNICATION AMONGST
EVERYBODY INVOLVED IN A PROJECT.
I WOULD ALSO LIKE TO THANK AT THIS
POINT IN TIME DR. DALE STRICKLAND
AND DR. CRIS HEIN FOR JOINING US
TODAY.
AND FOR TAKING TIME OUT OF THEIR
SCHEDULES TO TALK ABOUT TIER 3
AND 4 PARTICULARLY TIER 3 STUDIES.
AND I WOULD LIKE TO THANK YOUR

AUDIENCE FOR TAKING TIME OUT OF YOUR DAY TO JOIN US FOR OUR SECOND BROADCAST AND WE WILL BE HOLDING A THIRD BROADCAST COMING UP.
SO MAKE SURE TO WATCH FOR THAT ANNOUNCEMENT.
WE WILL BE TALKING ABOUT PEER 4, POST- CONSTRUCTION STUDIES AND FATALITY ESTIMATORS AND REPORTING.
SO THANK YOU VERY MUCH FOR YOUR TIME TODAY.
WE LOOK FORWARD TO JOINING YOU AGAIN ON OUR NEXT BROADCAST.