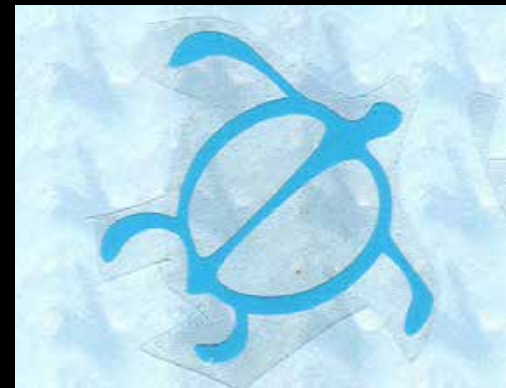


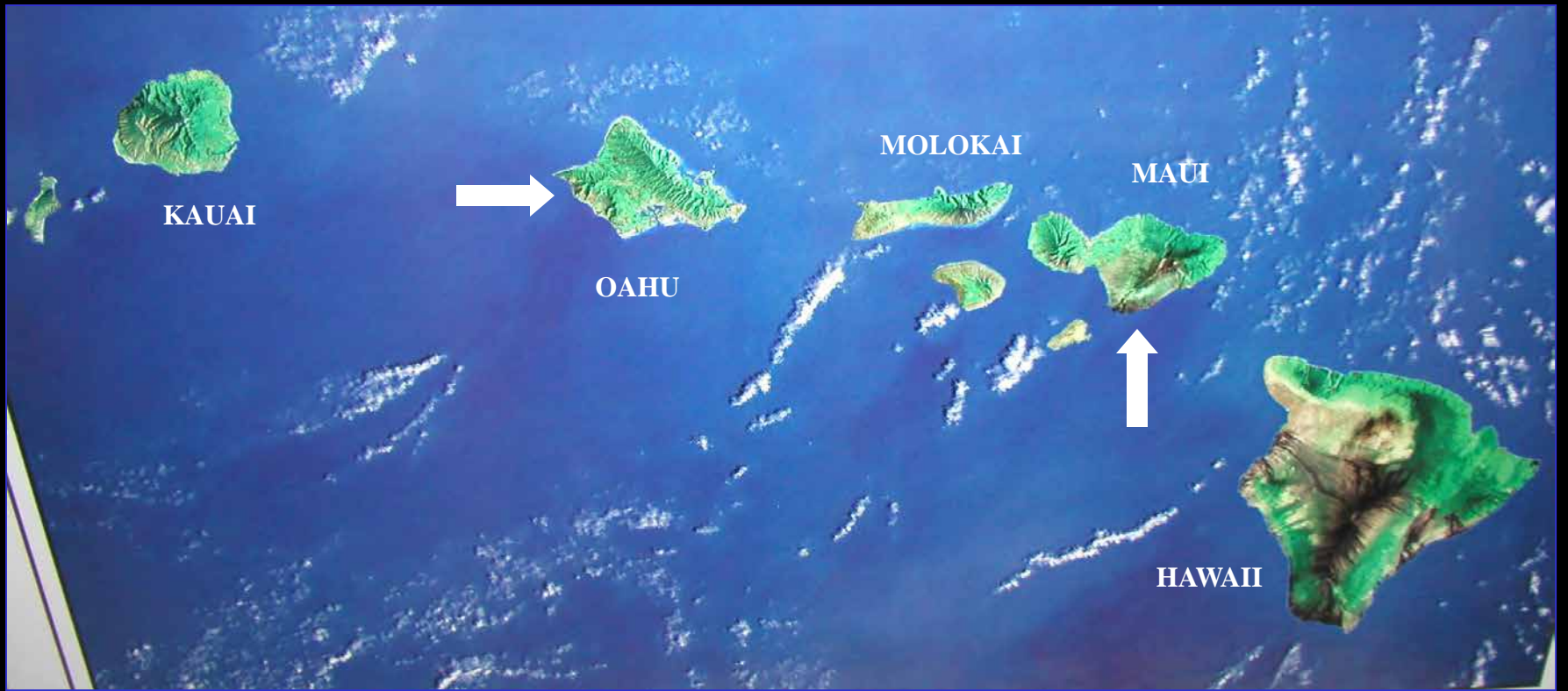
# **CLINICAL EVALUATION OF LIVE SEA TURTLE STRANDINGS IN THE HAWAIIAN ISLANDS 1996-2005**

**ROBERT A. MORRIS DVM**

**KAILUA.HAWAII**







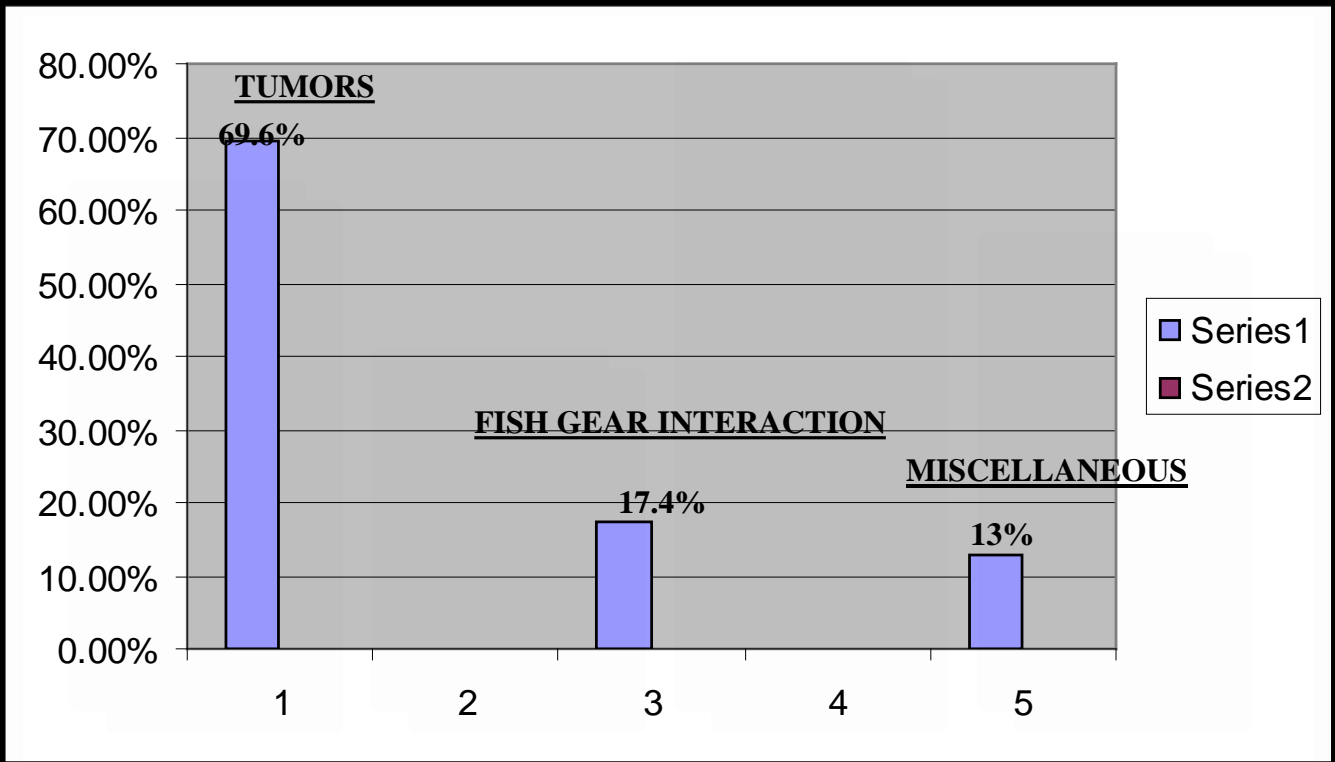
**HAWAIIAN ISLANDS FROM SPACE**

# **STRANDINGS**

**LIVE STRANDINGS EVALUATED BY VETERINARIAN  
HAVE INCREASED FROM 17 IN 1996 TO A PEAK OF  
83 IN 2005**

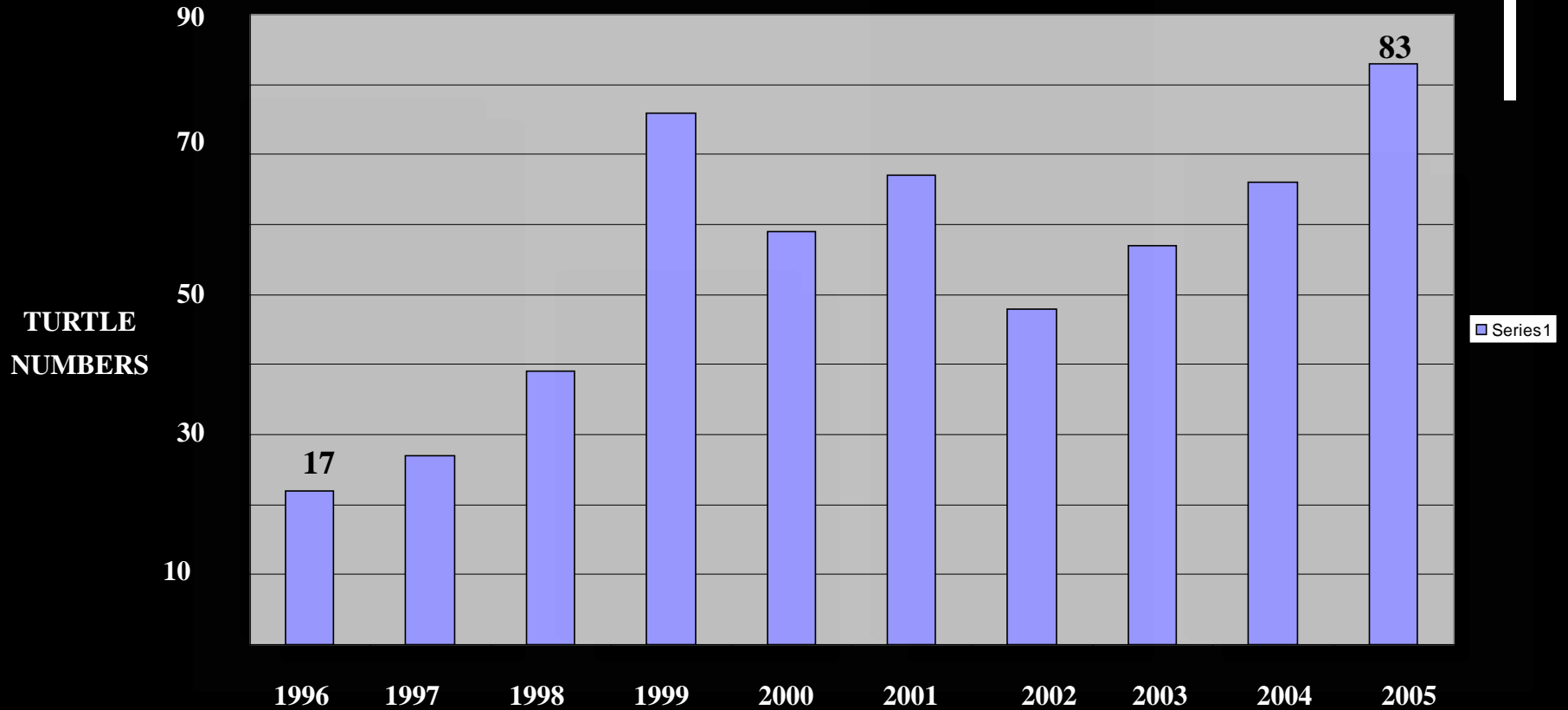
**ABOUT 79% OF THESE STRANDINGS OCCUR ON THE MAIN  
ISLAND OF OAHU**

**MANY OF THE STRANDINGS ARE FIBRO-PAPILLOMA TURTLES  
THESE TURTLES ARE IN POOR HEALTH AND ONLY A FEW CAN  
BE SAVED**



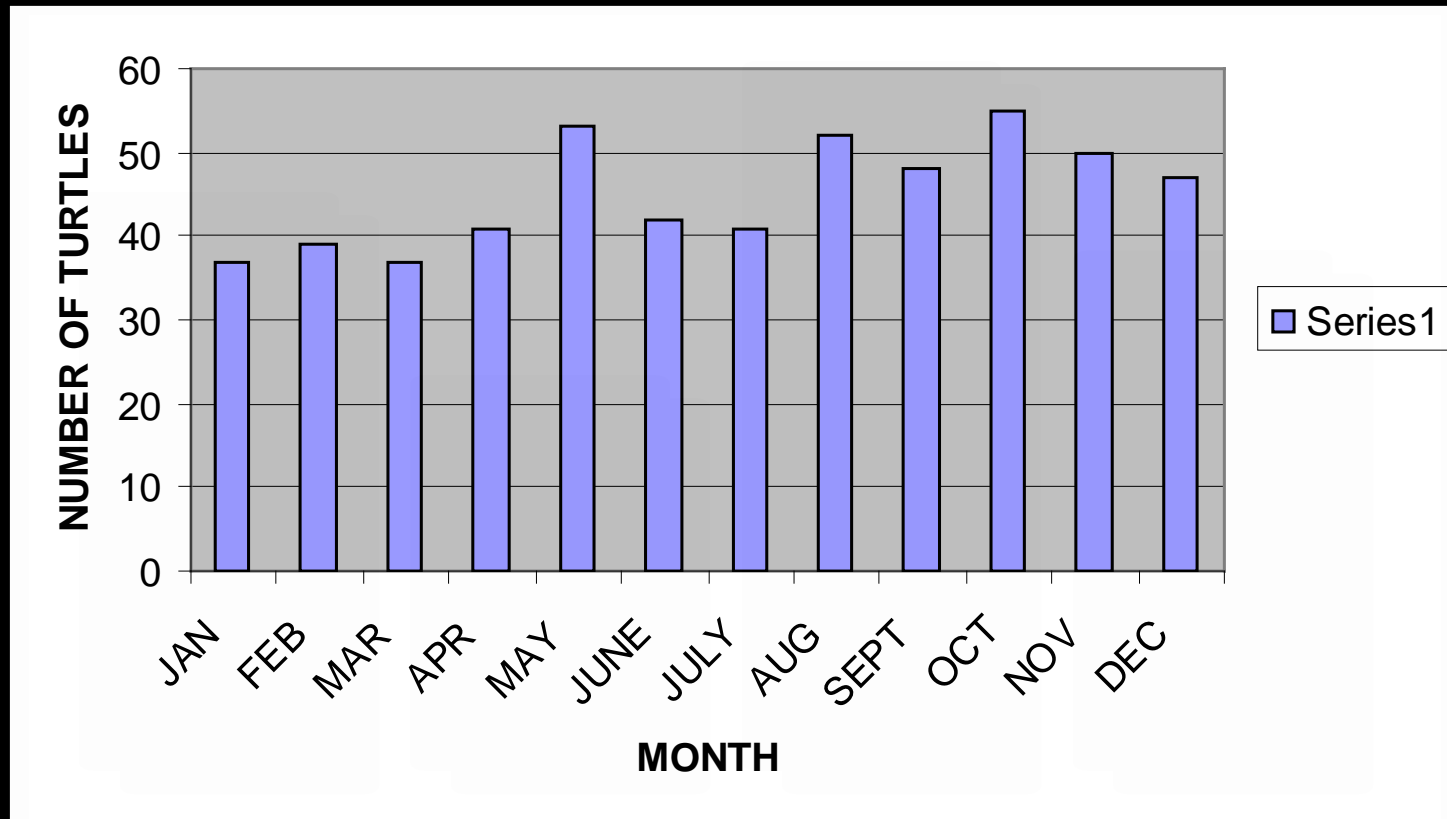
## **SUMMARY OF 546 LIVE STRANDINGS EXAMINED BY VETERINARIAN BY DIAGNOSIS**

**MISCELLANEOUS INCLUDES SHARK BITES, BOAT STRIKES, TRAUMA, ETC**



**Live strandings evaluated by veterinarian for 10 year period**

**Number = 542**

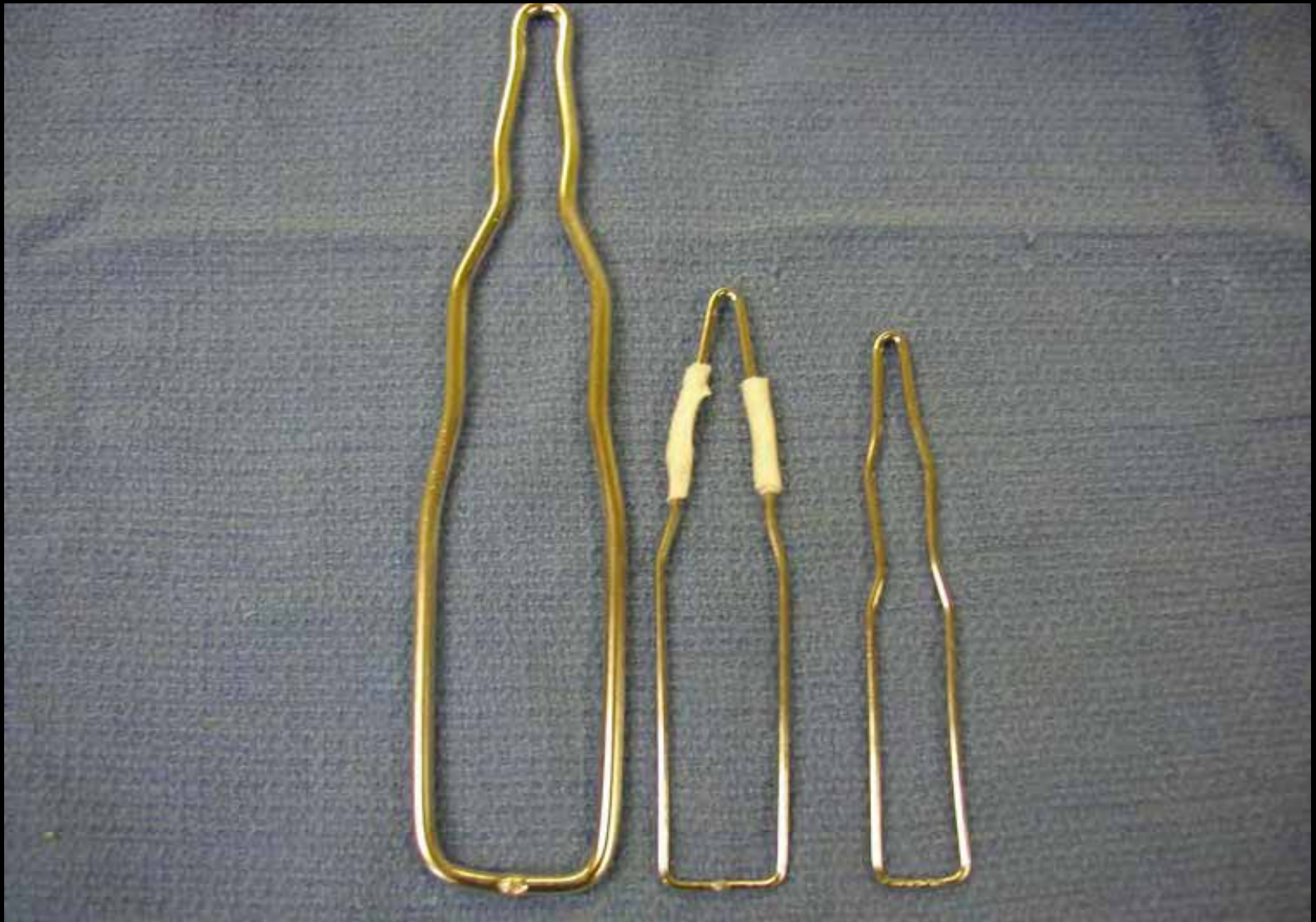


**10 YEAR LIVE STRANDING NUMBERS BY MONTH FOR 542 LIVE TURTLES**



**Evaluation of stranded turtles**





**AVIAN SPECULUMS FOR MOUTH EXAMS**



**CANINE SPECULUM**



**MOUTH AND THROAT EXAM**



**Canine speculum for hands free mouth exam**



**THE PACKED CELL VOLUME (PCV) AND TOTAL PROTEIN (TP) CAN BE USED AS AN INEXPENSIVE QUICK EVALUATION OF HEALTH**



## ENDOSCOPY EQUIPMENT

USEFUL FOR INTERNAL EXAMS AND SEX DETERMINATION



**HEALTHY GREEN TURTLE**



**EXAM OF HEALTHY GREEN TURTLE**





**A HEALTHY FULL PLASTRON ON A GREEN TURTLE**



**NORMAL TURTLE ON RIGHT AND EMACIATED TURTLE ON LEFT**



**SAME TWO TURTLES- NOTE DIFFERENCES IN PLASTRON COLORATION AND BODY CONDITION**



**SEVERE EMACIATION IN A  
OLIVE RIDLEY**



**EYE EXAM**



**NORMAL EYE**



**CATARACT**

**CAN BE CAUSED BY TRAUMA AND/OR INFECTION**



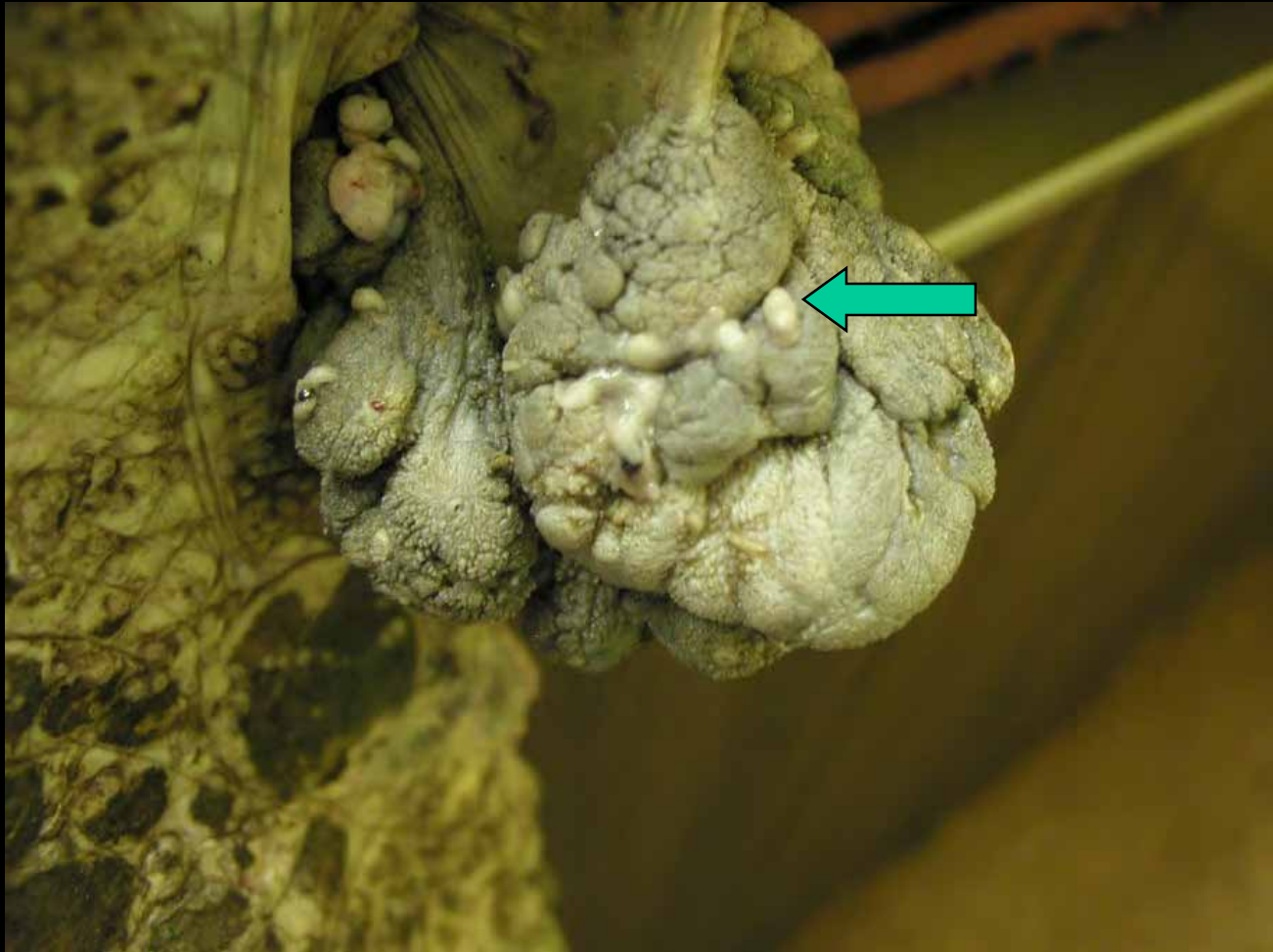
**CLOSE OBSERVATION OF SKIN AND SHELL AREA IS IMORTANT**

**Leech eggs**





Adult leeches



**Leeches on tumor**



**A TURTLE COVERED WITH BARNACLES INDICATING INACTIVITY  
AND PROBABLE SEVERE ILLNESS**

# **COMPLETE BLOOD COUNTS (CBC) AND BLOOD CHEMISTRIES**

**INTEGRATE WITH:**

**HISTORY**

**PHYSICAL EXAM**

**X-RAYS**

**LAB TESTS**

**TO MAKE A DIAGNOSIS**



## **BLOOD DRAW FROM DORSAL CERVICAL SINUS**



**NEEDLE SIZE 20-22 GAUGE-3.5-4.0 CM IN LENGTH**

# **MOST COMMON CAUSE OF STRANDINGS**

## **FIBROPAPILLOMAS**

**THESE TURTLES ARE:**

**EMACIATED**

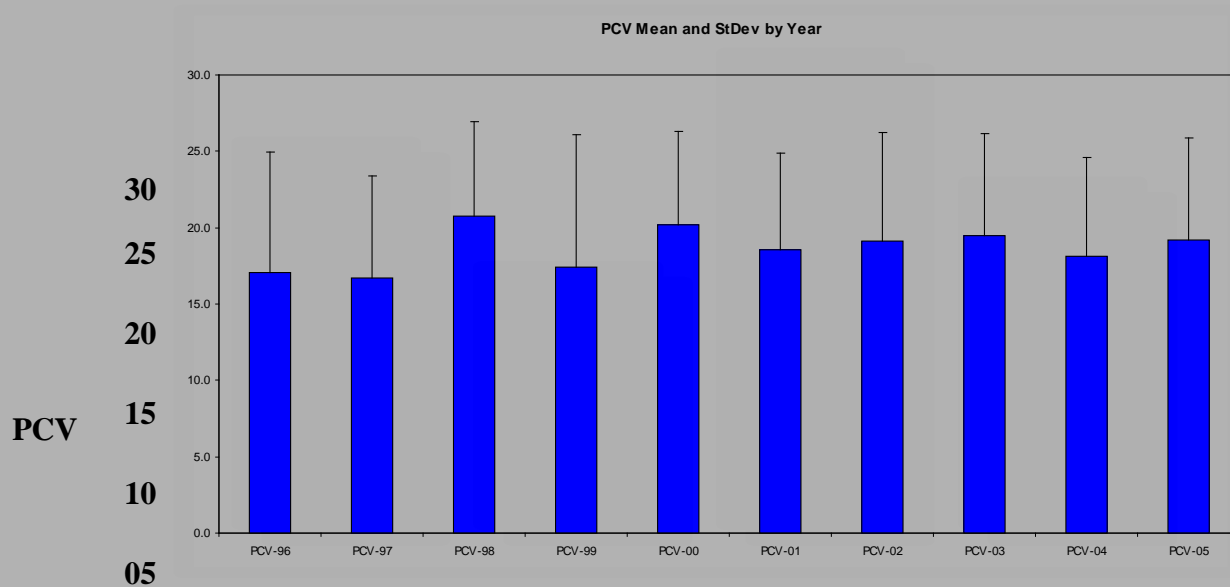
**ANEMIC**

**HYPOPROTEINEMIC**

**BACTEREMIC**

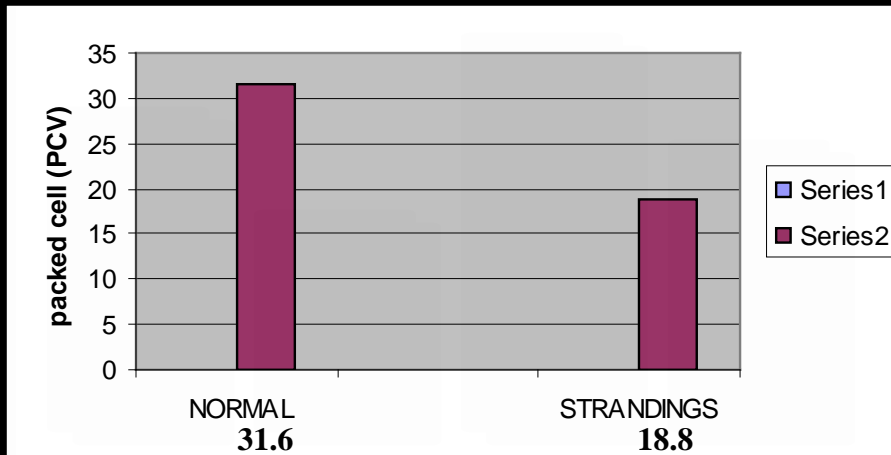
**PARASITIZED WITH CARDIOVASCULAR  
TREMATODES AND LEECHES**

# PCV

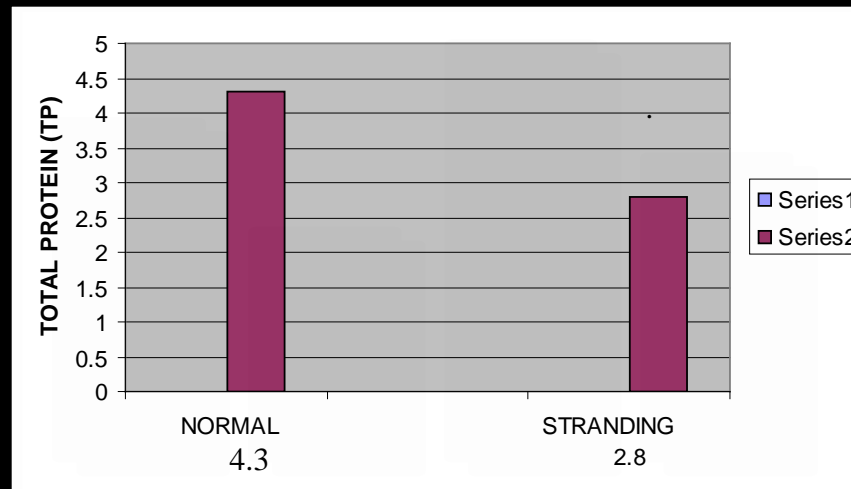


**PACKED CELL VALUES OF 320 TUMOR STRANDINGS BY YEAR FROM 1996-2005**

**COMBINED 10 YEAR MEAN WAS 18.8 WITH A STANDARD DEVIATION OF 6.9. THESE TURTLES ARE SEVERLY ANEMIC**



**AVERAGE PCV FOR 50 NON-TUMORED TURTLES COMPARED TO 320 STRANDED TUMORED TURTLES**



**AVERAGE TOTAL PROTEIN FOR 50 NON-TUMORED TURTLES COMPARED TO 314 TUMORED TURTLES**



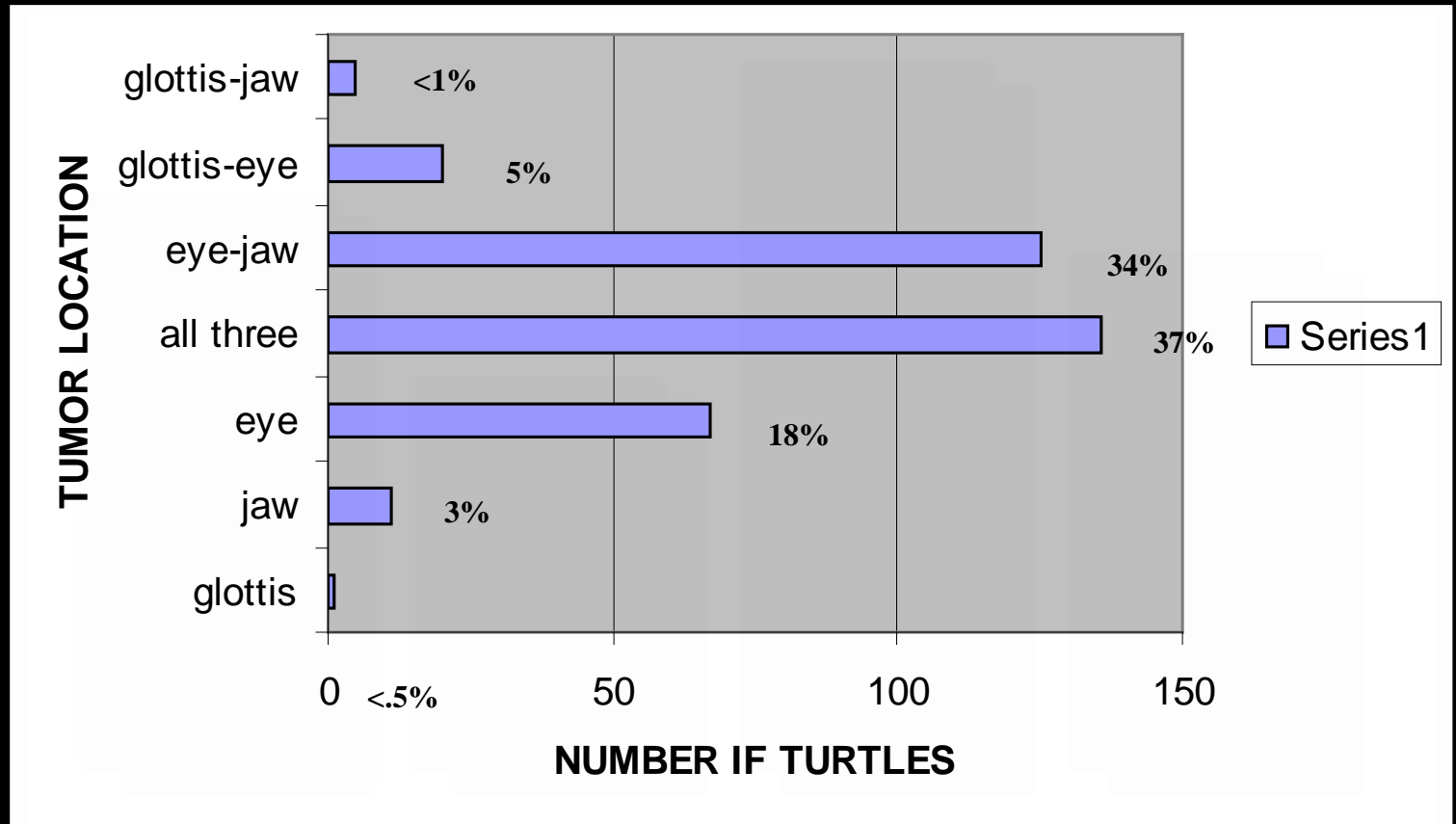
# **THE THREE BIG KILLERS**



**EYE TUMORS**

**GLOTTIS TUMORS**

**JAW HINGE TUMORS**



**FACIAL DISTRIBUTION OF EYE, GLOTTIS AND JAW-HINGE TUMORS ON 365 LIVE STRANDINGS**



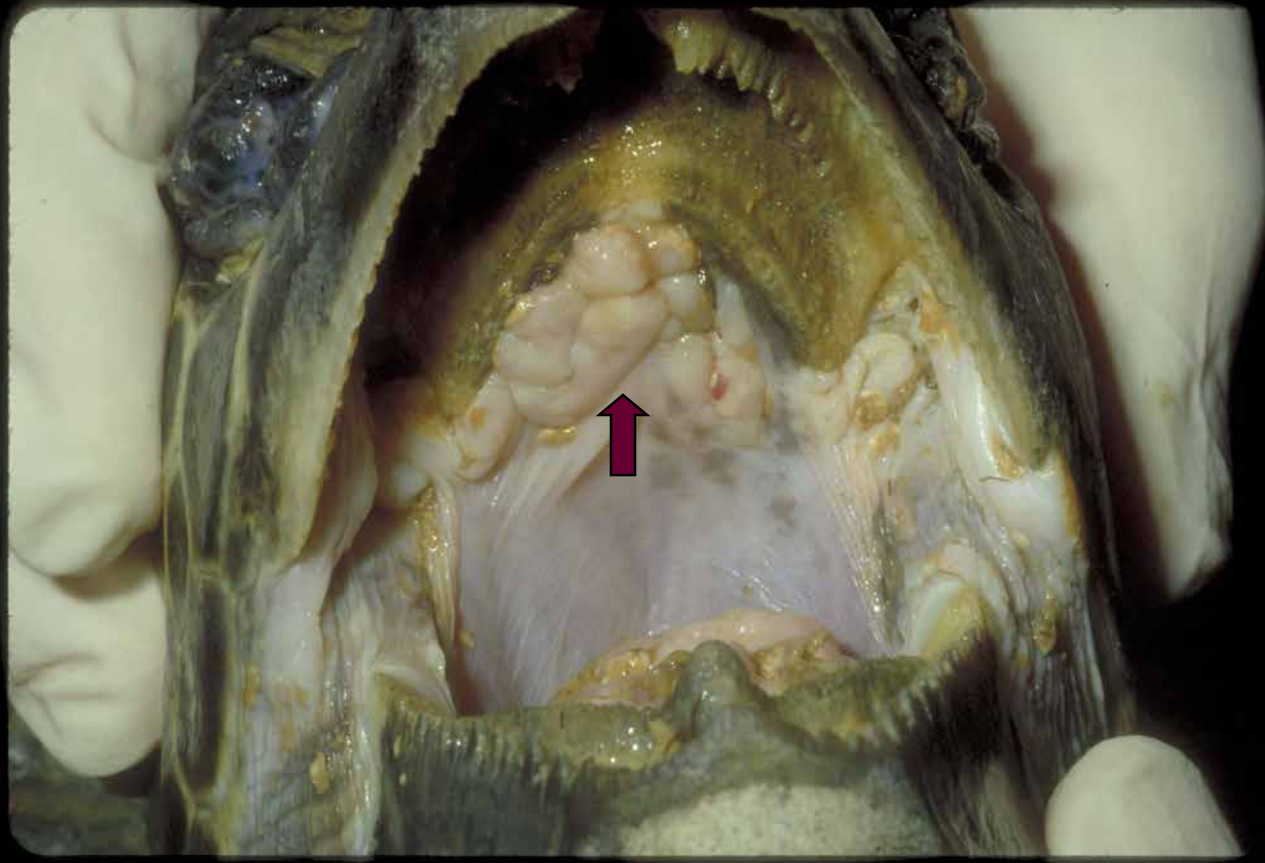
**SEVERE NECROTIC EYE TUMOR**



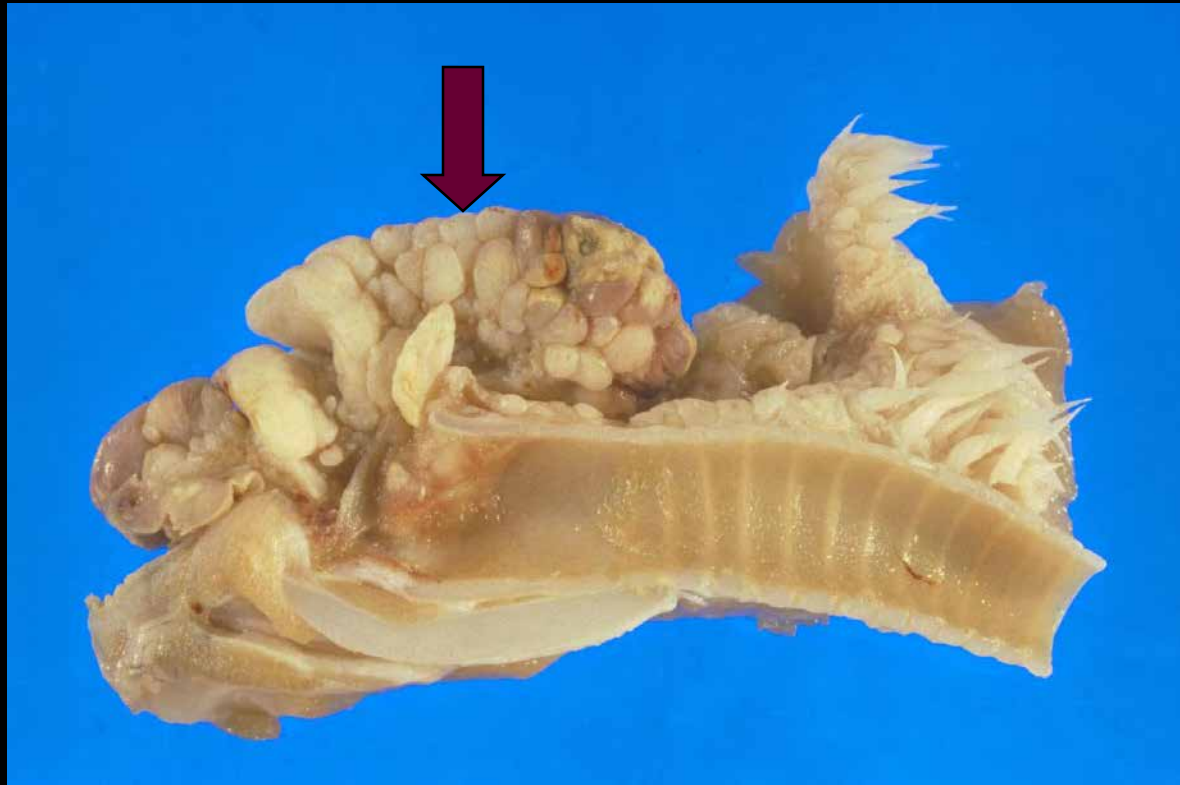
**Eye tumor**



**Glottis and mouth tumor**



**TUMOR BLOCKING INTERNAL NARES**



**NECROPSY SECTION OF TRACHEA SHOWING  
GLOTTIS TUMOR**



**JAW HINGE TUMORS**

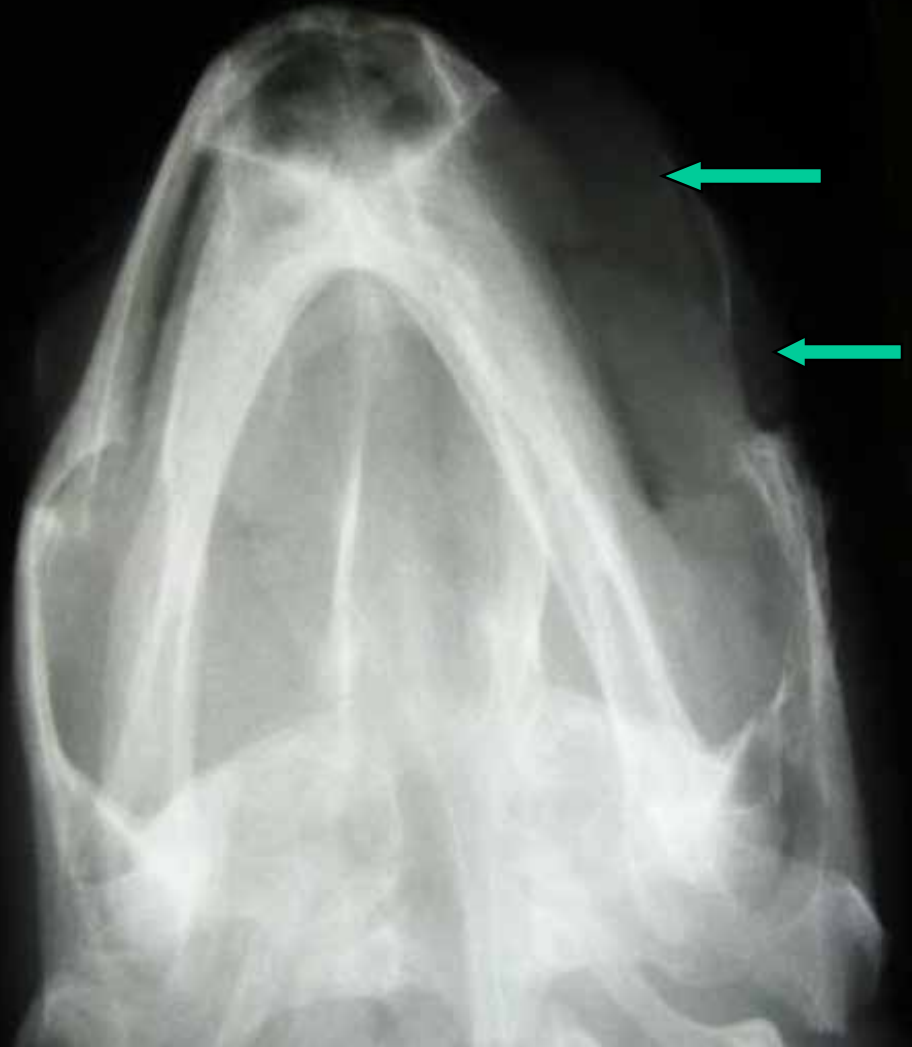




**INVASIVE JAW HINGE TUMOR**



**NORMAL SKULL X-RAY**

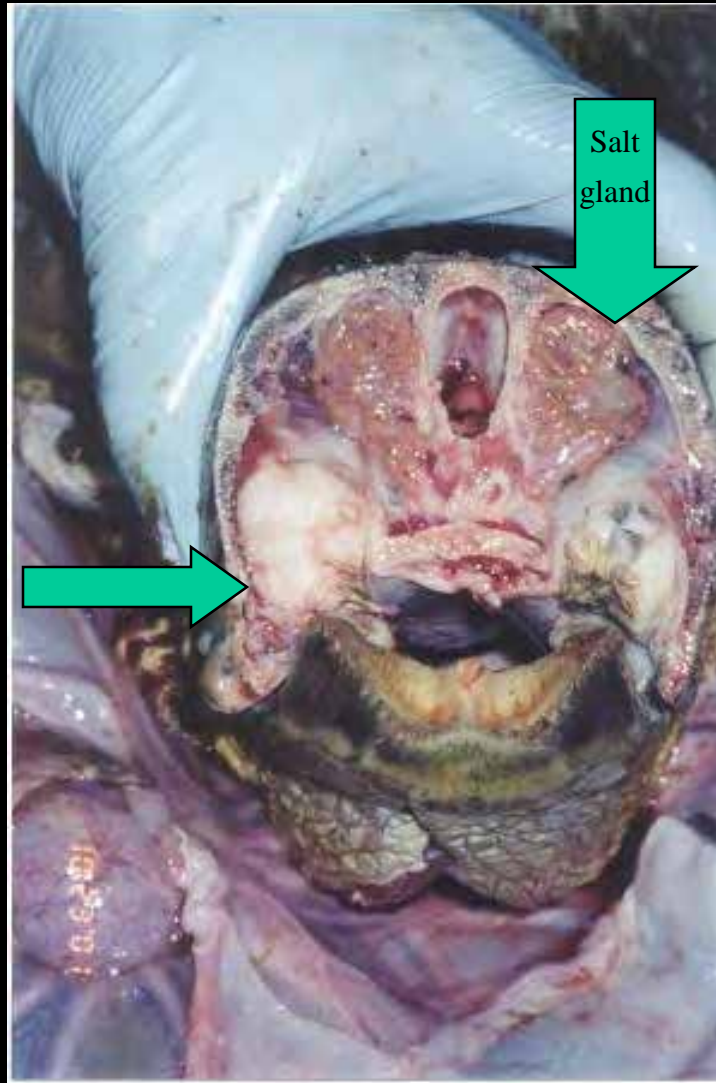


**X-RAY SHOWING BONE DESTRUCTION BY TUMOR**



**X-RAY SHOWING DESTRUCTION OF MAXILLARY BONE**

**JAW HINGE TUMOR**

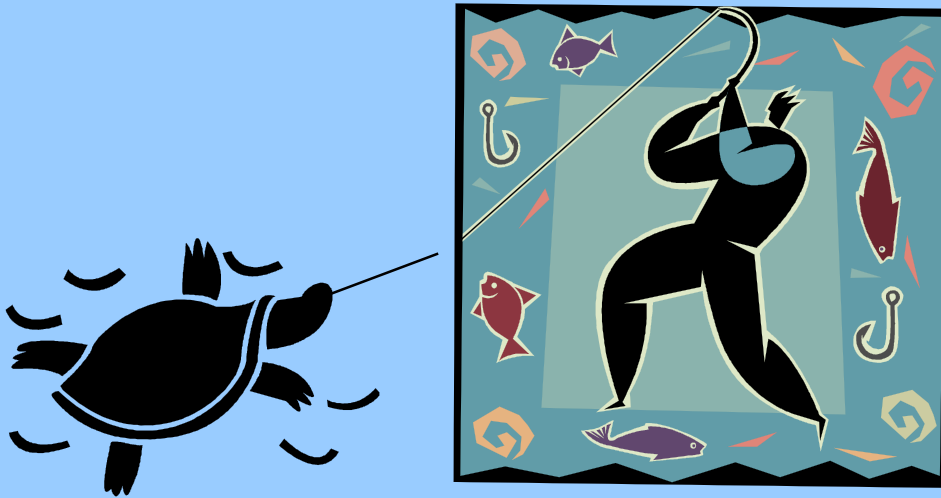


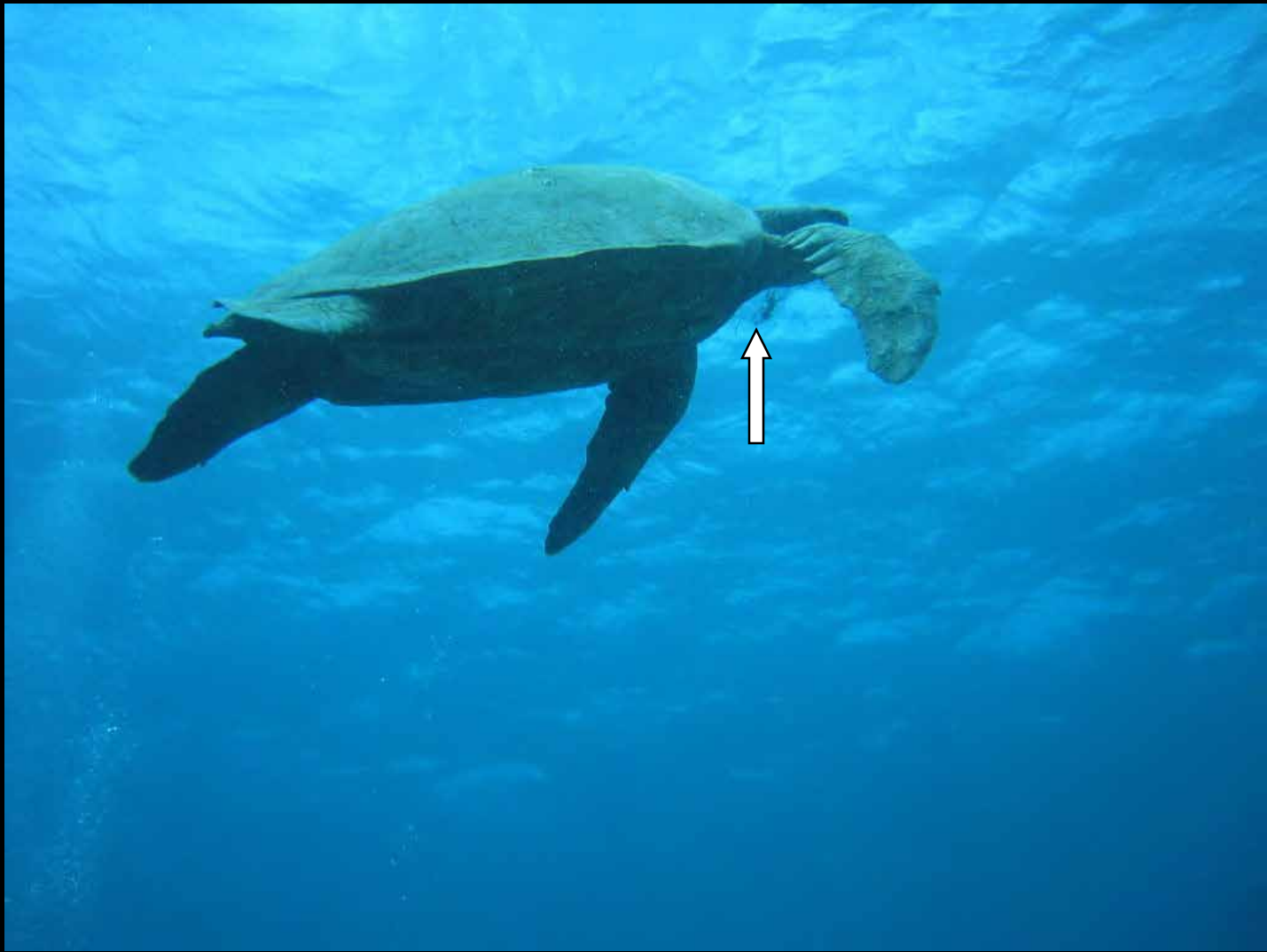
**Invasive jaw hinge tumor showing salt gland**

# BIG PROBLEMS FOR THE TURTLES

MONOFILAMENT LINE

HOOKS



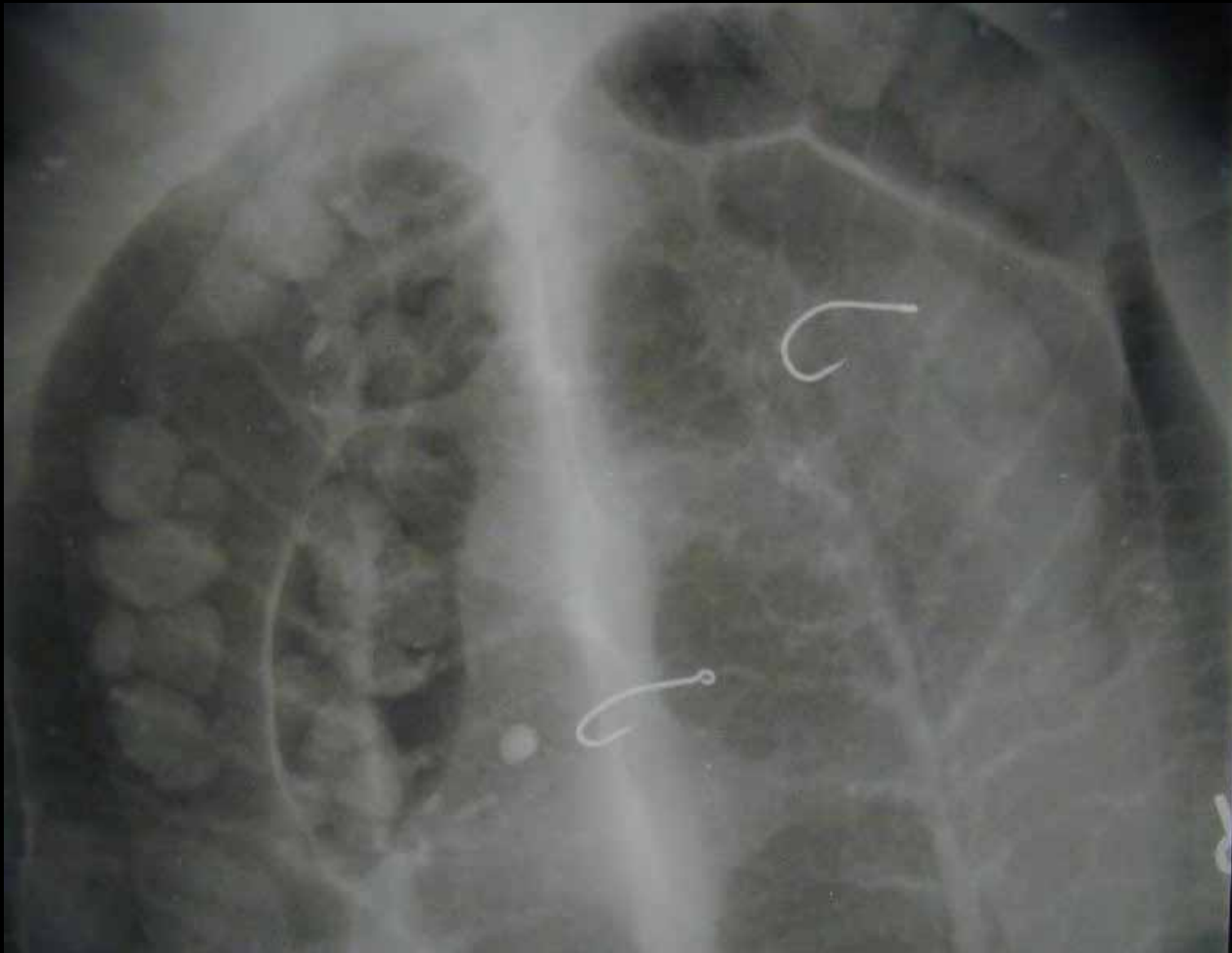


**MONOFILAMENT LINE ENTANGLEMENT**



**INGESTED MONO FISHLINE**

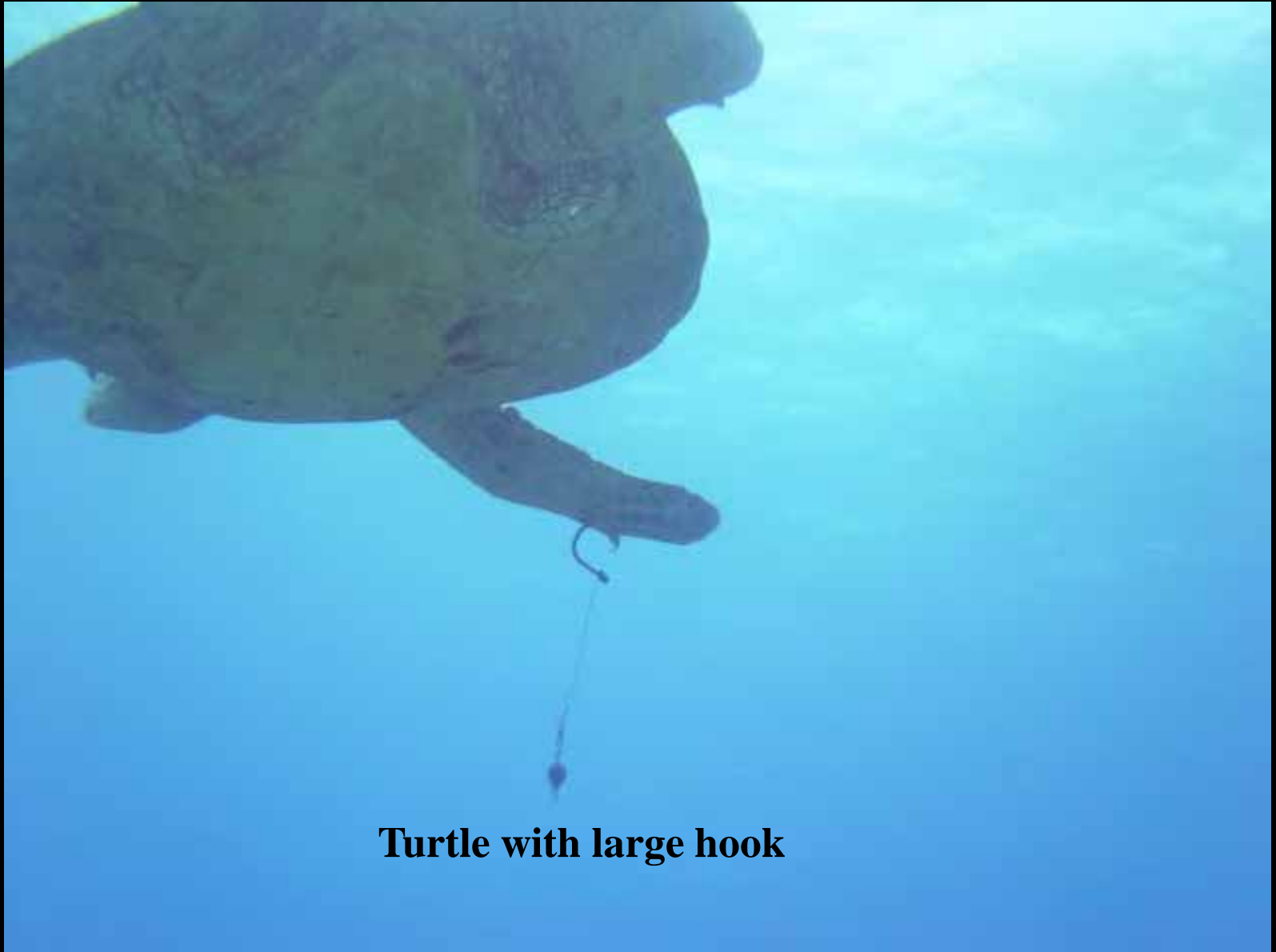




**BEFORE ATTEMPTING LINE REMOVAL-- CUT LINE  
SHORT OR X-RAY FOR HOOKS**



**Ingested line-if no hooks are present, many times it may be removed by gentle traction**



**Turtle with large hook**



**HOOK WITH MONO LINE**



**HOOKS INJURIES LIKE THIS MUST BE REMOVED BY SURGERY**

**A LOCAL ANESTHETIC IS INJECTED AROUND THE SITE**



**Monofilament line around flipper and down the throat**



**Deep cuts through the muscle are common**



**EVIDENCE OF NECK ENTANGLEMENT**





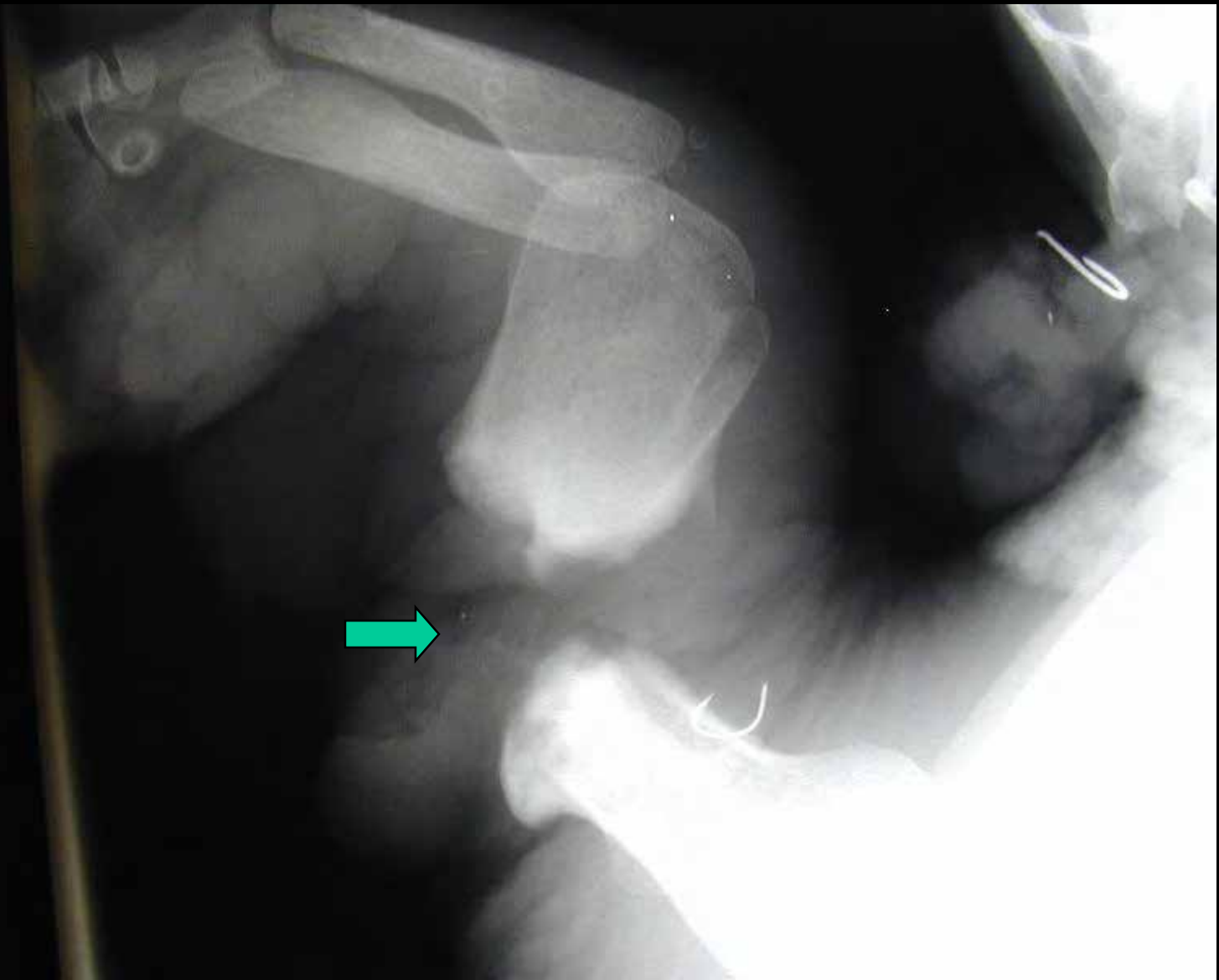
**A SEVERE CASE OF ENTANGLEMENT RESULTING IN A  
NECROTIC FLIPPER**



**ANOTHER CASE OF LINE STRANGULATION-AMPUTATION  
IS THE ONLY TREATMENT**



**RADIOGRAPH SHOWING HOW LINE CONSTRICTION CAN CAUSE BONE NECROSIS AND FRACTURES**



**RADIOGRAPH OF BONE FRACTURE FROM LINE  
ENTANGLEMENT**

# **CRITERIA USED TO TO DETERMINE IF EUTHANASIA IS THE ONLY CHOICE**

**HISTORY (REPEAT STRANDER) ?**

**PCV AND TP VALUES**

**LOCATION AND SIZE OF TUMORS**

**BODY CONDITION**

**ACTIVITY LEVEL OF TURTLE**

**CONFIRMATION OF DECISION BY ROBERT MORRIS  
GEORGE BALAZS AND THIERRY WORK**

# **SURGERY**

## **ANESTHESIA**





**FOR LOCAL ANESTHESIA:  
LIDOCAINE:**

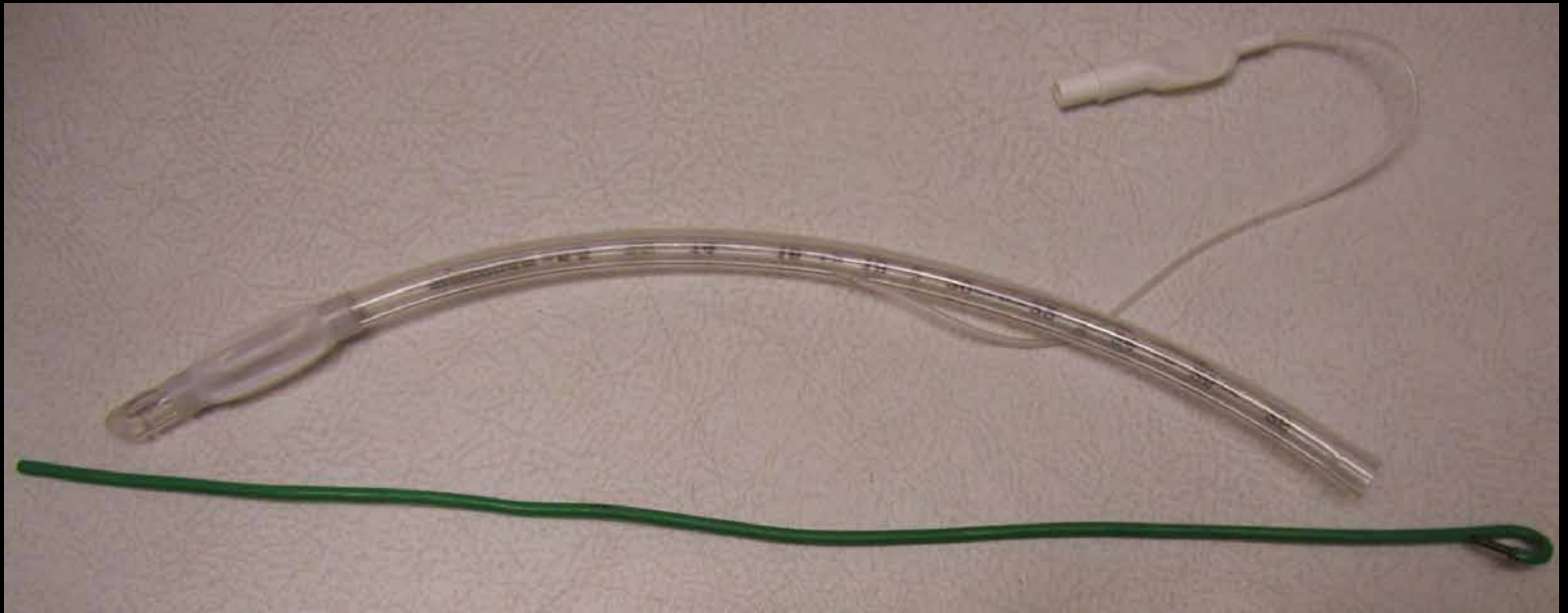
**BUPIVACAINE (MARCAINE) LONGER  
ACTING**



Use Only  
Sevoflurane

Use Only  
Isoflurane





**FOR GAS I USE ENDOTRACHEAL TUBE WITH STILET  
INSERTED –NO SEDATION-FORCED INTUBATION –  
THE TURTLES BREATHING IS CONTROLLED BY  
ASSISTANT**



**DOPPLER FOR MONITORING HEART RATE**



**READY FOR SURGERY**



**ENDOTRACHEAL TUBE IS SECURED THRU A CANINE SPECULUM**



**SURGICAL REMOVAL OF HUMERUS AT JOINT**



## **COMPLETED SURGERY**

**RECOVERY CAN BE LONG-1-4  
HOURS BEFORE TUBE REMOVAL**

**BY WARMING THE TURTLE THE  
TIME CAN BE SHORTENED**

**USE WARM FLUIDS I. P. AND WARM  
WATER BATH**



**READY TO GO (41 AMPUTATIONS)**







**RELEASE TIME**



**MASSIVE JAW TUMOR**



**AFTER SURGERY**

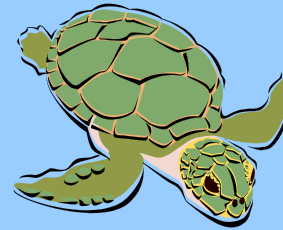
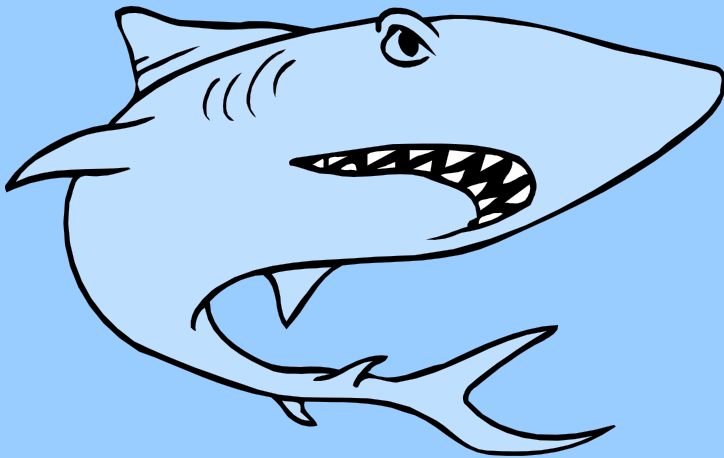


**CRYOSURGERY WITH  
LIQUID NITROGEN**



**USUALLY DO THREE FREEZE THAW CYCLES**

# SHARK ATTACKS





**FATAL SHARK BITES**



**FATAL SHARK ATTACK**





**REAR FLIPPER SHARK BITE**



**LOGGERHEAD WITH SHARK INJURIES**

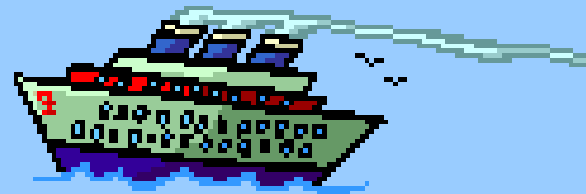


**LOGGERHEAD INJURIES**



**RELEASE OF SAME LOGGERHEAD AFTER  
SEVERAL MONTHS OF REHAB**

# BOAT STRIKES





**FATAL BOAT STRIKE**



**GREEN TURTLE WITH BOAT INJURIES**



**CLOSE UP OF SHELL DAMAGE**





## DENTAL ACRYLIC FOR SHELL REPAIR



**A TWO-PART APPLICATION-POWDER APPLIED FIRST, THEN  
LIQUID ACTIVATOR**



**FINISHED REPAIR**



**SPLIT SHELL FROM BOAT-WIRES APPLIED TO  
PULL SPLIT TOGETHER**



**REPAIR COMPLETE AFTER DENTAL ACRYLIC APPLIED**



**HEAD INJURY-FIRST TRIMMED SCUTES AND CLEANED WOUND**



**COMPLETED REPAIR**

# **FLOATING TURTLES-A REAL CHALLENGE**

**CAN BE CAUSED BY AIR OR GAS IN DIFFERENT LOCATIONS**

**GAS IN G.I. TRACT**

**CELOMIC GAS**

**LUNG COLLAPSE OR HYPER INFLATION**

**LUNG AIR LEAK**

**MUST SORT OUT CAUSE AND TREAT ACCORDINGLY**

**FOREIGN BODY**

**INFECTION**

**TRAUMA**

**TUMOR**





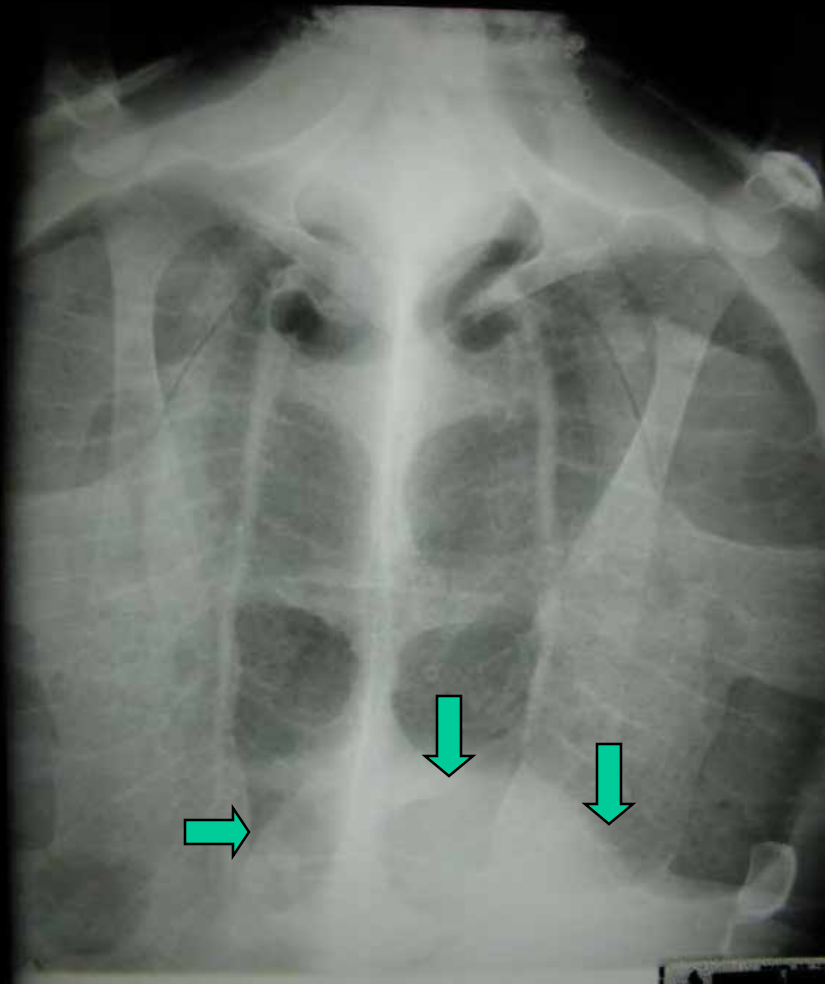
**VISUAL EVIDENCE SUGGESTING THESE  
TURTLES CANNOT SUBMERGE**



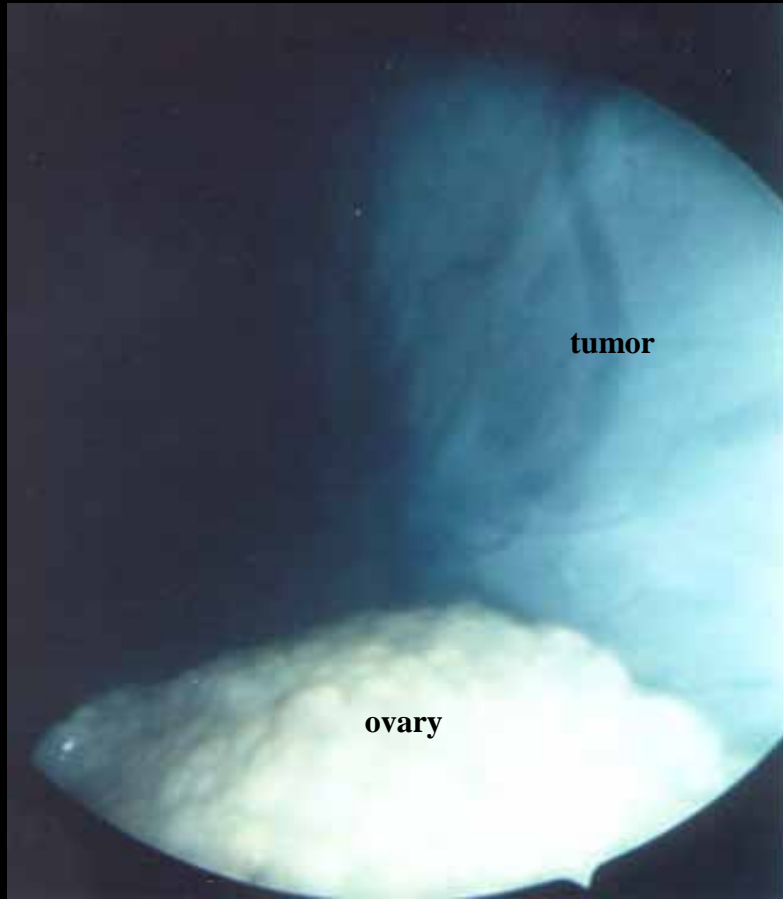
**HAWKSBILL WITH BOUYANCY PROBLEM**



**LARGE GREEN WITH SINGLE EXTERNAL TUMOR  
A “FLOATER”**



**X-RAY REVEAL SOFT TISSUE MASS IN  
POSTERIOR ABDOMEN**



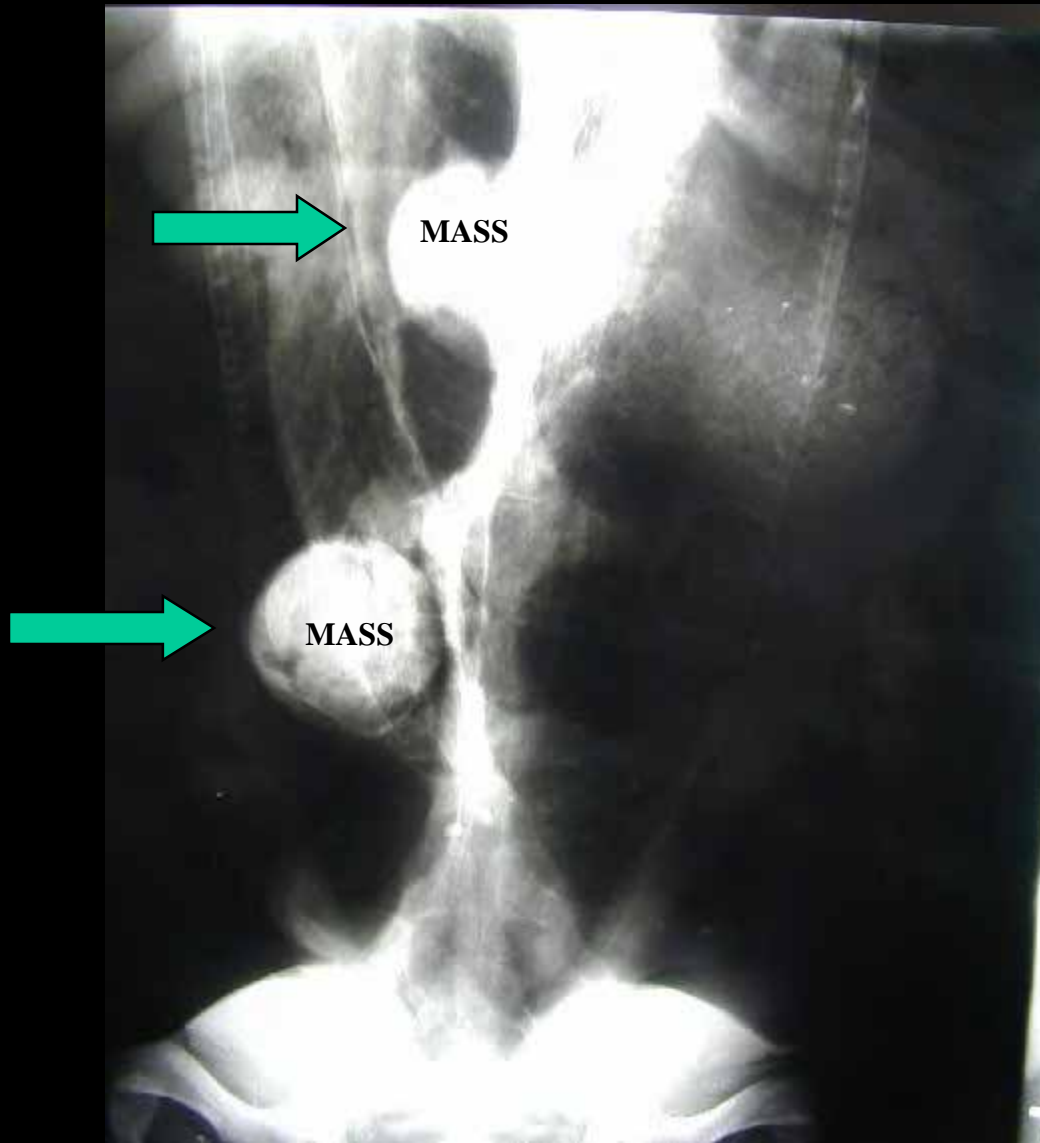
**VIEW OF MASS WITH ENDOSCOPE**



**NECROPSY BY DR WORK REVEALED  
LARGE RENAL TUMOR**

# INTERESTING CASES





**X-RAY OF TURTLE SHOWING SEVERAL  
ABNORMAL DENSITIES**





**NECROPSY REVEALS LUNG TUMORS**



**TURTLE WITH SPEAR IN HEAD**



**SPEAR ENTRY**

PHILIP. HI 80734

R



**X-RAY OF SPEAR DORSAL VIEW**



**LATERAL VIEW-SPEAR HAD PINNED LOWER JAW SHUT**

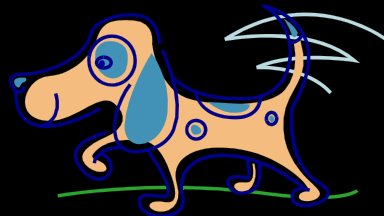


**REMOVAL WITH PIN DRIVER**



**SUCCESSFUL REMOVAL AND TURTLE WAS TREATED  
AND RELEASED**

**IMPORTANT TO REMEMBER WITH DRUG DOSAGES—**  
**SEA TURTLES ARE NOT THE SAME AS DOGS AND CATS**



**TURTLE METABOLISM OF DRUGS CAN BE MUCH SLOWER THAN  
MAMMALS**

**SOME DRUGS ADMINISTERED ONCE OR TWICE DAILY TO  
MAMMALS CAN BE GIVEN EVERY 3-5 DAYS TO SEA  
TURTLES**



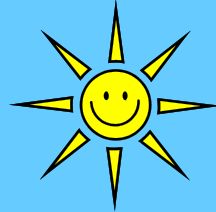


**FLUIDS OF CHOICE GIVEN FOR CORRECTION OF DEHYDRATION:  
SALINE, LACTATED RINGERS, NORMISOL**



**FLUIDS GIVEN AT 20 ML/KG/DAY GIVEN  
INTRAPERITONEAL TO CORRECT DEHYDRATION**

# **THE GOOD NEWS**



**THE NUMBERS OF TURTLES HAVE BEEN INCREASING**

**THE INCIDENCE OF FIBROPAPILLOMA IN SOME  
AREAS SEEMS TO BE DECREASING**



**THE FUN PART OF THE JOB--RELEASE**



**A HAPPY TURTLE**



**RELEASE**