BEST PRACTICES FOR ECO-FRIENDLY YACHTING
For the past 12 years, the Prince Albert II of Monaco Foundation has been ceaselessly working to protect our Earth, supporting both private and public projects working to limit the impacts of climate change, safeguard biodiversity, and promote sustainable management of our water and natural resources.

Since the launch of the Wood Forever Pact in 2010, the Foundation has worked in collaboration with the Monaco Yacht Show to promote sustainable yachting and encourage environmental excellence. Welcoming over 36,000 participants last year, the Monaco Yacht Show has the ability to reach a significant portion of the superyacht industry and impress upon them the importance of shifting in a greener direction.

This industry continues to expand, both in the number and size of superyachts, and thus it is more important than ever that superyacht owners, builders, and designers take every possible step to mitigate their impacts on the environment. With the incredible innovations and technology available in 2018, there is no excuse not to own or design a superyacht that protects our seas and the species with whom we share it. Furthermore, now it’s about more than just addressing the threats that luxury yachts pose to the environment: this economic sector is on the rise and with the growing appeal of an eco-friendly yacht, making these changes is not only an investment in the environment, but a strategic business investment as well.

The third volume of this guide, which was originally launched by the Prince Albert II of Monaco Foundation in 2016 to promote eco-friendly yachting practices, will offer advice on how to enjoy the beauty of the sea without damaging it. This guide will underline the biggest threats that luxury boats pose for both marine life and humans and will draw attention to the newest strategies to promote a greener Earth while guarding esteem and extravagance. We have observed great progress in the past several years through legislation, sustainability projects, and the initiatives of the superyacht industry—let’s keep the momentum going!

The tremendous influence you carry as a superyacht owner gives you the power to be a trendsetter in this ever-increasing sector. This guide seeks to provide the tools for change, but ultimately, it is up to you to take initiative and guarantee the preservation of our Earth for generations to come.
Power of Progress

Legislative Advancements and Potential Positive Changes in the Yachting Industry

“Since 2010, Myanmar has lost more than 1.3 million acres of forest each year making it the third worst country in terms of deforestation on the planet [while] 70% of Myanmar’s population is heavily dependent on forests for their basic needs.”

Food and Agriculture Organization (FAO)

MARPOL VI in Monaco

MARPOL Annex VI enforces a progressive reduction of the NOx emissions from diesel engines and the sulfur content of fuel and prohibits the deliberate emission of ODS (Ozone Depleting Substances) in an effort to improve the atmospheric environment. Under the revised MARPOL VI, the global sulfur cap will be reduced to 0.5% by January 1, 2020.

The Principality of Monaco has submitted a proposal to adopt stricter regulations under MARPOL Annex VI, which demands the implementation of fuel with a 0.1% sulfur cap, as opposed to the 0.5% level previously mandated as well as the use of scrubbers, providing benefits to the environment as well as human health (source: International Maritime Organization-IMO). These regulations should be adopted very soon (fall 2018) and will regulate the coast of Monaco. Random checks of on-board fuel log books as well as sampling and analysis of fuel will ensure compliance.

Opportunity for eco-change in the yachting industry

Recently the yachting industry has been putting some efforts in order to sustain durable supply chains of wood, notably within the teak industry in Myanmar. Stakeholders are grouping together in order to keep this chain viable and exploitable for all parties involved.

We acknowledge the potential of those synergic actions within the yachting industry worldwide. We hope that these initiatives will be used to raise solid environmental standards, sign strong agreements with relevant parties and create tangible actions demonstrating a thorough and monitored desire to protect forests ecosystems and promote eco-friendly operations.
In addition to global actions being taken to protect teak, the Prince Albert II of Monaco Foundation is specifically engaged in several teak-focused projects:

The Wood Forever Pact was launched by the Prince Albert II of Monaco Foundation in 2010, in conjunction with financial support from the Monaco Yacht Show. Members of the Wood Forever Pact are devoted to the transparency of their wood sources and engage in the effort to adopt environmentally-sustainable behaviors.

To learn more about the Wood Forever Pact and take a step towards environmental excellence, visit: www.fpa2.org/wood-forever-pact-en.html

In addition to its work with the Wood Forever Pact, the Prince Albert II of Monaco Foundation, in conjunction with the Programme for the Endorsement of Forest Certification (PEFC) and the Myanmar Forest Certification Committee (MFCC), is in the midst of a 3-year project to support advancements towards sustainable forest management in Myanmar. This mission has established a platform to further develop pilot projects and continues to promote sustainable forest management practices in both natural forests and plantations.
Battling Bio-fouling the Right Way
How to Protect Our Precious Marine Life

Preventing Damage to both Boats and Ecosystems
Biofouling is the accumulation of microorganisms, plants, and algae on wet surfaces. Biofouling is inevitable, even on ships that have just been cleaned or treated with a new anti-fouling system and presents problems for both shipowners and the oceans. The accumulation of organisms can damage the hull and propulsion system of the ship. It can also increase drag up to 60%, increasing fuel consumption by 40%. Biofouling thus contributes to greater fuel emissions and increased production costs. It also significantly contributes to the transfer of invasive species, a threat that jeopardizes biodiversity, the ecological and economic well-being of our planet, and introduces serious health threats (source: IMO).

Rules and Regulations
In May 2017, the IMO, GEF (Global Environment Facility), and UNDP (United Nations Development Programme) announced the USD 6.9 million GloFouling Partnership Project, which seeks to reduce the introduction of invasive aquatic species, especially in developing countries (source: IMO). Ideally, this partnership will lead to healthier ecosystems and will prevent future environmental and economic damages. Governments are becoming increasingly aware of the severity of this issue and, in the cases of California and New Zealand, are beginning to implement more stringent biofouling regulations. Adopting safe and effective antifouling techniques not only protects our oceans but also guarantees compliance with stricter regulations.

Anti-Fouling Alternatives
The industry has moved away from the use of many biocides, as they often contain harmful compounds. In addition to non-toxic coatings that are fairly efficient, there are several new developing strategies that employ the use of ultrasonic waves, enzymes, or silicone liquids. These include Sonihull, eSHARK, Mactac, and Selekt, a product which temporarily activates the “swimming mode” of barnacle larvae, preventing them from settling on the hull.

Another alternative is the use of the underwater drone, KeelCrab, which inspects and removes algae from the hull without lifting any anti-fouling coating. This drone can be driven by remote control.

If you’re having trouble determining which antifouling system is right for you, AzkoNobel’s Intertrac Vision is an app that, based on factors such as vessel type, fouling challenges, and mode of operation, will assess the value of different systems on power requirements, CO2 emissions, etc.
Protecting Posidonia

Posidonia Oceanica is endemic to the Mediterranean and is one of the most crucial ecosystems on the coast, as it protects marine life, prevents erosion, and acts as a major carbon sink. This species is a critical oxygen provider, often being referred to as ‘the lungs of the Mediterranean’.

The environmental benefits provided by Posidonia are ten times higher than tropical forests, resulting in economic benefits equal to 14000 euros per hectare per year (source: Nature Magazine). While contaminants including detergents, hydrocarbons, and elements of anti-fouling paint are certainly harmful to these meadows, the more pressing issue is the destruction of these meadows that arises when a boat anchors in a Posidonia seabed. In the past 50 years, we have observed a 34% degradation of this beloved seagrass (source: medwet.org). Superyachts are especially dangerous to these posidonia meadows, for they anchor between 10 and 20 meters of depth the region where posidonia predominately resides.

Alter How You Anchor

Ideally, one should try to anchor in sandy areas to avoid any risk of disrupting the seagrass. However, if you must moor in a seagrass area, be sure to use the appropriate length of chain to avoid drag, use extreme caution when lifting the anchor, and clean your anchor after use so as not to introduce invasive species to your next anchor spot.

When possible, it is best to anchor within a collective mooring field. These fields use corkscrew anchors, which have 4-5 times the holding power of a traditional anchor and do not destroy the seabed.

Saving the Lungs of our Oceans

One hectare of Posidonia produces 100,000 liters of oxygen each day!

Posidonia Protection Progress

There are many projects currently being conducted around the Mediterranean to safeguard this species.

The Balearic Islands house the largest Posidonia meadows in the Mediterranean Sea. In response to increased tourism and thus increased destruction of Posidonia, in 2017 they launched the Save Posidonia Project in hopes of raising awareness and sponsoring innovative technologies to eliminate the threat to Posidonia meadows. Along with the 77 ecological buoys already installed, they pledged to increase their fleet of anchor patrol boats in high traffic areas. Currently, these ecological buoys are only suited for small boats (up to 25 m); however, in any port, it never hurts to ask whether your superyacht can be accommodated: a greater demand for superyacht moorings will result in a greater supply!

The Prince Albert II of Monaco Foundation is currently supporting a program to protect the posidonia off the coast of Corsica. The goal is to monitor how the implementation of specific regulations, such as the interdiction of boats under 20m from anchoring in posidonia meadows, reduces anthropogenic damage to these fields.

Villefranche-sur-Mer is working to establish new regulations that prohibit anchorage in areas rich with posidonia. (See map to the left). The city has future plans to install ecological moorings capable of housing up to 60 small boats, both visiting and permanent, to prevent further destruction of the posidonia ecosphere and the abandonment of boats within the bay. Currently there are two large buoys in the bay (on the picture above and in red on the map), primarily used for military and cruise ships. However, the port of Villefranche encourages superyacht owners to request these buoys if they are not in use. A pilot on board is mandatory for all ships greater than 50m when anchoring in the bay or mooring on the buoys. The pilot can request these buoys for your private use if so desired. This maneuver not only ensures the privacy and greater security of your yacht during your stay but also mitigates undesirable impacts on the fragile posidonia. Hopefully moving forward, we will see the installation of buoys such as these reserved exclusively for the mooring of superyachts.
The Importance of Coral Reefs

“...To lose coral reefs is to fundamentally undermine the health of a very large proportion of the human race.”
Ruth Gates, director of the Hawaii Institute of Marine Biology.

Conserving Coral

Like Posidonia, coral reefs are one of the most valuable ecosystems on Earth; they house thousands of species, prevent erosion, and act as a food and economic resource for millions of people. They also play an important role in the development of new medicines. Coral are at risk everywhere: from almost extinct endemic species in the Mediterranean to the Great Barrier Reef. We have lost 50% of the world’s coral in the past 30 years if the world could halt global warming now, scientists still expect that more than 90 percent of corals will die by 2050, and if we don’t act now, we risk losing them all not to mention that we have lost half of marine life in the last 40 years and 1 out of 4 marine species live inside coral reefs even though they cover 0.1% of our oceans.

Additionaly, as announced this year and until June 2019 Monaco will host the International Coral Reef Initiative (ICRI) Secretariat and will co-chair the Secretariat along with Indonesia and Australia until mid 2020 (for more info visit www.icriforum.org).

Sunscreen That’s Green

2018 marks the 3rd International Year of the Reef. It’s the perfect time to become informed about the threats that jeopardize our reefs and start implementing the best available practices to protect them.

In the past 5 years, studies have revealed the effects of oxybenzone and octinoxate (ingredients found in most sunscreens) on coral. These chemicals are extremely toxic, and with approximately 14,000 tons of sunscreen deposited into the oceans each year, they have noticeably adverse effects like damage to coral DNA and larvae, particularly in areas with a high frequency of divers. This past May, Hawaii passed a bill prohibiting the sale of oxybenzone and octinoxate-containing sunscreen with hopes to prevent further coral bleaching, along with harm to algae, sea urchins, and fish.

With the increased frequency of coral bleaching events as a result of climbing ocean temperatures and acidification, it is essential that we take every step to minimize threat to our coral. Though it seems insignificant, selecting a sunscreen without these toxic chemicals or better yet, opting for other forms of sun-protection, is both a simple and vital adjustment.

Mitigating pressures we can control, such as modifying our sunscreen, preventing sewage pollution and overfishing, is essential if we want to help our coral thrive in the future.
The Impacts of Noise

In the past 50 years, ocean noise levels have increased by tenfold!

Blue World Institute

Noise Destroys...

Though the noise of a ship may be nothing more than a small nuisance to passengers, its impacts can be detrimental for marine life, especially marine mammals. Aquatic animals heavily rely on sound to communicate, and disruptions under the water's surface can interfere with their ability to find food, attract mates, and avoid predators. Anthropogenic underwater noise can also induce long-term stress and greater susceptibility to illness.

A 2015 study on the noise hotspots of the ACCOBAMS (see next page) area highlighted the serious impacts of anthropogenic noise in the Mediterranean Sea, such as Sperm Whales and Cuvier's beaked whales.

One of the 11 main objectives of the Barcelona Convention’s “Ecosystems Approach” in the Mediterranean is to ensure that marine life is not negatively impacted by human-caused noise. Noise pollution is rarely at the forefront of our minds when we consider the harmful impacts of yachting, but it is a very relevant issue.

Solutions

Quest for Quiet

The intergovernmental Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area (ACCOBAMS) is in the process of determining zones particularly susceptible to risks of noise pollution. Reducing the speed of your boat, avoiding the utilization of water toys such as jet skis in these areas is particularly important.

Additionally, remain wary of your surroundings; to avoid encounters with large cetaceans while on board, always keep an eye out and use a program such as REPCET (Real time plotting of cetaceans - www.repcet.com) to monitor your position with respect to nearby cetaceans. Finally, the use of a hybrid electric or diesel electric engine will generate less noise and vibration.

Superyacht ‘Home’ the 2017 winner of the MYS/RINA award at the Monaco Yacht Show, for example, is capable of running in a hybrid ‘quiet mode’ which runs exclusively on quiet generators mounted inside an enclosed sound box.

Likewise, Wider 150 can run on energy from lithium polymer battery banks, allowing it to function in complete silence (it was the first superyacht to obtain a perfect score for sound and vibration levels with RINA!). These two superyachts exemplify the importance of considering noise levels when designing a yacht.
Watch your Waste!
New Waste Regulations and How to Comply

Rules and Regulations

In April 2018, the European Parliament approved the Circular Economy Package which aims to create a circular lifecycle of products via reuse and recycling to benefit the environment and the economy. This package mandates that all EU member states reach a 55% recycling rate of municipal waste by 2025, which will increase to a rate of 65% by 2035.

Member states are also expected to make all plastic packaging recyclable by 2030. This package invests hundreds of millions of dollars in the search of sustainable economic and social development and brings us one step closer to a zero-waste society. Europe's commitment to the environment is commendable and hopefully these initiatives will spark a chain of future enterprises.

The Drastic Threats of Plastic

Being both lightweight and incredibly durable, plastic is used everywhere, and its presence in our oceans is one of the most serious and pervasive threats to the Earth. Plastic can take centuries to degrade, and even once it is broken down microplastics remain, which can absorb toxic substances like DDT and PCBs.

In addition to being aesthetically displeasing, plastic pollution is detrimental to our ecosystems, killing more than 100,000 marine mammals and millions of birds and fishes annually (source: NOAA - National Oceanic and Atmospheric Administration). The accumulation of contaminants in seafood also poses a risk to human health.

Rules and Regulations

MARPOL Annex V prohibits the release of all garbage into the sea, including food, operational waste, incinerator ashes, and notably, plastic. It also mandates the presence of reception facilities at all ports and requires that ships greater than 100 tons or permitted to carry 15 or more people carry a garbage management plan on board with written procedures to minimize waste.

The EU has taken great strides in 2018 towards the reduction of waste. As part of the Circular Economy Package, they released the Plastics Strategy and adopted the waste package that was decided by the European Parliament at the end of 2017. These agreements will reduce the EU’s dependence on raw materials and their production of greenhouse gas emissions, litter, and impact on the marine environment. (source: European Union Council).

Beyond Plastic Med (BeMed) launched by the Prince Albert II of Monaco Foundation and its partners Tara Expeditions Foundation, Surfrider Foundation Europe, the Mava Foundation, and later joined by the IUCN (International Union for Conservation of Nature), is one of many initiatives combating plastic pollution and searching for alternatives. To learn more about BeMed, visit www.beyondplasticmed.org

Each year, 8 million tons of plastic end up in the ocean, accounting for up to 80% of marine litter.
Plasticoceans.org
Eco-friendly and Luxurious

Following environmentally-friendly and sustainable practices does not mean sacrificing luxury. It is easy to combine luxury and sustainability - a few simple changes can transform your super-yacht.

For your linens, food products, and other consumer goods try to stick to fair trade-certified (www.fair-trade.net) and organic-certified products to make sure their manufacture and their lifecycle will be the least harmful possible to the environment while taking into account social and local community impacts. As in being very often related, check Monalison for instance, a company that specializes in boating linen with organic certification and fair-trade cotton (www.monalison.co.uk).

On organic products the EU has recently passed a new regulation on certifications, regulation (EU) 2011/848 (accessible on EU law website: www.eur-lex.europa.eu).

Eco-friendly Fun

There are many eco-friendly super-yacht toys that minimize impact on the environment. Electric jet skis and surfboards minimize fuel emissions. Often powered by reusable lithium-batteries, these power toys can be charged in one to two hours and are operating at 100% emission-free. Likewise, electric tenders are increasingly popular and reduce fuel emissions. Investing in a greener tender is a benefit for both the environment and your wallet. As Lénya Boats (see next page) has exhibited, choosing an electric tender made of sustainable, recyclable materials can be achieved without forfeting comfort or prestige. Constructing their boats from sustainably-sourced birch, cork, linen fiber, and plant-originated epoxy and employing advanced battery recycling technology, Lénya Boats strives to transform the yachting industry with the environment in mind.

Choosing the right fish

Overfishing disrupts marine communities and jeopardizes long-term food security. Over 30% of the world’s fisheries have been pushed beyond their biological limits. It is important that you ensure the fish you indulge in are sustainably sourced. Mr. Goodfish is a project which aims to educate consumer about the prevalence of overexploitation and offers environmentally responsible seafood options (for more info visit: www.mrgoodfish.com).

If everyone in France consumed one of these recommended species just once a year, 18,000 tons of endangered fish could be saved.

FAO
Interview with François Richard from Lanéva Boats - a Monaco-based Company Thriving to Build Eco-friendly Yachts

What are the qualities that distinguish Lanéva from other boats, and how do they minimize the threat to the environment?

François Richard (Lanéva’s Business Development Manager): Lanéva boats were developed on three major principles: 100% battery-operated motorization, sustainable and recyclable materials, and an on-board intelligence to increase security and comfort. In every possible instance, we seek performance with natural or sustainable materials to minimize our environmental footprint as much as possible. Additionally, we already address the 2nd life and recyclability of our batteries. We think that this final point is key in ensuring our boats have the smallest possible ecological impact.

What are your plans for the next few years?

François Richard: We are already working on our next innovations involving propulsion, energy economy, and innovative sustainable materials.

Is there anything you would like to add?

François Richard: Lanéva is a young Monégasque company whose development was accelerated thanks to MonacoTech developed by the Princely Government, Monaco Telecom, and Xavier Niel. We hope to become an active and innovative long-term player in the yachting industry in the Principality.

Both on land and at sea, plastic golf balls are inevitably lost and become litter. However, if golfing is a must on your yacht, Ecobioball is a non-toxic, biodegradable golf ball containing fish food at its core. These balls permit one to practice golf aboard without jeopardizing ocean welfare. Be sure you are using environmentally-friendly cleaners and detergents, particularly avoiding those that contain bleach and chlorine. This eliminates the release of harmful chemicals into the ocean and reduces the threats to our oceans. To discover green boating products and services, consult The Green Directory, a resource provided by Sailing Networks and The Green Blue that offers alternative environmentally-friendly products: www.sailinglog.net/green.

Choosing Lanéva is choosing…the boat of the future without sacrificing the design...thus affirming commitment to classic boats, innovation, and a respect for the marine world.

François Richard, Business Development Manager at Lanéva
Chosing a proper end-of-life for your yacht

Most boats being made of fiberglass material which is fairly easy to re-use but quite difficult to re-cycle, it is important to care about the “end-of-life” protocol of a yacht. Because of restrictions on the disposal of fiberglass in landfills in numerous countries, along with the enormous cost and complexity that comes with recycling a yacht at the end of its life, boat owners often choose merely to abandon or sink their vessel. This generates navigational obstacles, pollution, and expensive removal costs. Many governments recognize the enormous cost associated with dismantling ships and are trying to reshape legislation to address this problem. More and more solutions are available to make sure out-of-service boats are well dismantled and parts are re-used for new constructions (see next page).

Desert the “Cradle-to-Grave”

Mindset: Rethinking Boat Deconstruction

Of the 6 million recreational boats in the EU alone, it is estimated that 95% of them are composed of re-usable fiberglass.

International Institute for FRP in Construction
Between 35 to 40 million boats are approaching their end-of-life worldwide, a looming crisis. Sustainability in the Marine Industry, a conference of the Marine Equipment Trade Show, has revealed the urgent need for new techniques in the marine industry.

While these new techniques may provide suitable solutions for boats reaching their end-of-life, from an environmental standpoint, future boats should be constructed with their deconstruction in mind. Using of greener materials, such as aluminum, steel, and natural composites, whose resins are composed of natural fibers like flax and bamboo will minimize waste and could reduce the carbon footprint by 20-50%. The use of recyclable materials also offers financial benefits, as the boat’s initial acquisition cost could be offset by the future value of its recyclable content.

In the meantime, consult Boat DIGEST for clear and effective guidelines on safe dismantling practices and access to an extensive network of yacht dismantling and recycling facilities within the European Union. As of December 31, 2018, large commercial seagoing vessels flying the flag of an EU Member State must be recycled using a company on the European List of Ship Recycling Facilities (http://ec.europa.eu/environment/waste/ships/list.htm), all of which comply with safety and environmental requirements.

A “Cradle-to-Cradle” Mentality - re-using for re-building

In recent years, several projects, including RECYSHIP, Boat DIGEST, and BOATCYCLE, have been launched throughout Europe with hopes of developing new management methods and recycling techniques for end-of-life recreational boats. Just this year, Rhode Island launched the Rhode Island Fiberglass Vessel Recycling Program to investigate the dismantling and repurposing of fiberglass hulls.

IAMCI (Institute for Advanced Composites Manufacturing Innovation) has set the goal of making composites 80% recyclable in the next 5 years.

ACMA (American Composites Manufacturers Association) has an active project to develop a scalable methodology to recycle both carbon fiber and fiberglass. This thermolyzer technology, developed and tested in Forst, Germany this year, recycles all oils, tars, and liquids from composites and converts them into clean gases while recovering glass and carbon fibers. This process minimizes the amount of waste sent to the landfill and at the same time, creates the energy needed to sustain the recycling process. The first commercial-scale Thermolyzer plants are expected to be implemented across the US by 2019.
Simple Steps to Success

Be smart about your boat construction
• Opt for materials that can be recycled in the future.
• Try to incorporate previously recycled materials.
• Select sustainably-sourced raw materials.

Maintain a Clean Hull
• Use an eco-friendly anti-fouling agent to reduce drag and avoid species transfer.
• Use water-soluble cleaning products.

Protect Biodiversity
• Anchor in sandy areas or dock to a collective mooring field.
• Prevent the introduction of chemicals and foreign species into the water.
• Minimize sound pollution.

Eco-Friendly Materials
• Opt for eco-friendly materials when you can.
• Have fun and seek comfort in style with electric toys.

Bid Farewell with Prudence
• Elect a company that will be mindful of social and environmental factors when deconstructing your boat.
• Select sustainably-sourced raw materials.
Supporting Partner

MONACO YACHT SHOW

Technical Partners

www.atibt.com

www.ramoge.org

You can find this volume and volumes I and II on our website at:


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