

## Reference Sources

### ENVIRONMENTAL IMPACT OF HOVERCRAFT

From *Hovercraft Technology: Economics and Applications*: (1989, Pg. 7)

#### 1.1.2 Footprint Pressure

"As a corollary to the low resistance of the air cushion, there is the feature of a low cushion pressure which equates directly to a low footprint pressure on the surface. The effect of this low pressure (0.14 - 0.84 N/cm<sup>2</sup>) has advantages in reducing resistance over water, as is discussed in Chapter 2. The low footprint pressure is also of significance when operating over unprepared and sensitive terrain. To place this footprint pressure into perspective, consider the requirements for operating over the ecologically sensitive terrain, such as the tundra and bogs of the Arctic. From the work done by the University of Alaska (ref. 2) the maximum contact pressure to avoid ecological damage should be no more than 2.4 N/cm<sup>2</sup> (3.5 psi) for operation on tundra, and no more than 0.52 N/cm<sup>2</sup> (0.75 psi) for operation over bog. It is seen that the hovercraft is very compatible with these limiting values of footprint pressure. Similar favorable comparisons can be made with snow, mud and sand. By contrast, the footprint pressure of a conventional automobile tire or track is some ten times these values."

- David F. Dickens

DF Dickens Associates Ltd.

Vancouver, British Columbia, Canada

*David Dickens is a mechanical engineer with seventeen years of arctic research experience [in 1989]. He is the author of 17 technical reports and papers on arctic hovercraft design and operation, and has received the prestigious Peter Heron Winter Award for best conference paper at the 1984 Canadian Air Cushion Technology Society's International Conference on Air Cushion Technology. He is a member of the Canadian Institute of Marine Engineering, the Association of Professional Engineers of British Columbia, the International Glaciological Society and the United Kingdom Hovercraft Society.*

<http://www.hoverdril.com/Environmental%20Impact%20of%20Hovercraft.pdf>

#### **Environmental Impact of Hovercraft**

Damage to the shore environment, such as beaches, mud flats and vegetation is virtually nil because of the hovercraft's low pressure "footprint". For example, the average human being when standing on a beach exerts a pressure of some 3lbs per square inch underfoot, rising locally to 25lbs per square inch when walking. The average hovercraft by comparison, exerts a pressure of only 0.33lb per square inch on the surface regardless of speed. This "footprint" pressure is less than that of a seagull standing on one leg.

It therefore becomes obvious that fish and other marine life are in no way affected. This has been confirmed by independent scientific tests.

Dan Turner

Technical Vice President

Hoverdril, Inc. 2003

*Hoverdril was founded by the original founding members of Mackley Air Cushion Equipment who were responsible for highly successful commercial Hoverbarges such as the "Yukon Princesses, which were modular Hoverbarges, used by Alyeska Pipeline Services and the "Sea Pearl" which was a purpose-built sea-going hoverbarge that was used by Bechtel in the Middle East. George Wimpey, the United States Coast Guard, British Coal and Brown & Root have also used Hoverbarges in various configurations.*

[www.expedition-mekong.com/environmental.htm](http://www.expedition-mekong.com/environmental.htm)

#### **Expedition Mekong**

Environmental Assessment

Environmental disturbance:

Hovercraft possess several features that offer a lower environmental impact than conventional river craft:

A very low pressure "footprint" when operating on land: The average human exerts a pressure on the ground of some 25 lbs. per square inch when walking, whereas a hovercraft exerts a pressure of approximately 1/3 lb. per square inch on the surface regardless of speed.

*Prepared by Dr. John M. Baker for the Brooker Group Plc. and Diethelm Travel*

<http://www.airlifthovercraft.com/HoverInfo%20frameset.htm>

#### **Hovercraft: Hoverwork - Environmental data**

Hovercraft can be used to best advantage in shallow water and drying areas, these areas often being remote and environmentally sensitive. Hovercraft are able to operate in these areas in an environmentally friendly way for the following reasons:

- Very low footprint, pressure AP1-88 maximum of 180 Kg / m<sup>2</sup> above atmospheric.

Advantages:

- While very unlikely to occur, it is possible to hover over animals or birds without causing injury.
- Grasses and reeds depressed but will grow back.
- No 'scaring' of land.

<http://www.1hope.org/rifsdil.htm>

#### **Monterey Bay Toxics Project**

*HOPE - Ft Ord Burning RI/FS Critique by Dilworth Consulting*

Low-footprint-pressure vehicles are used in the arctic, in deserts with cryptogamic soils and crusts, and in swamps and other delicate ecosystems where the damage of a single footstep could last for 50 years. A well known example is a hovercraft ... These could be used at Fort Ord to suspend and move detection equipment across the landscape.

[www.hovercruiser.net/Index/](http://www.hovercruiser.net/Index/)

#### **Hovercrafts and the Environment**

A hovercraft uses a fan to create a low pressure air cushion under its hull, raising itself out of the water to minimize drag. Consequently, a hovercraft leaves little to no wake behind and causes minimal if any damage to shorelines. Having no underwater protrusions, it is not a danger to marine life. Since there are no underwater propellers, seabeds, and plant life are not at risk. A hovercraft when on cushion is not actually "IN" the water at all. It travels over the water, instead of through it as a boat does. Hovercraft do not have through hull fittings, and utilize sealed hulls. Any fuel or oil aboard the craft remains inside and does not contaminate the water. The craft are driven by air propellers and do not discharge exhaust and combustion by products into the water. Because hovercraft are environmentally friendly, they are an excellent choice for operation in sensitive areas and are capable of reaching areas other types of transportation cannot. Remote areas, mudflats, swamps, sandbars, dry areas, all may be traversed with a hovercraft leaving no trace of its passing. The pressure on the ground or water created by a hovercraft is less than the imprint force of a bird walking. Water lilies may be crossed without tearing the leaves. The negligible environmental impact of hovercrafts has been proven in British and Australian studies.